- Text: We solve the word problem for free double categories without equations between generators by translating it to the word problem for 2-categories
- Concepts: free double categories, equations, generators, word problem, 2-categories

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- Text: This yields a quadratic algorithm deciding the equality of diagrams in a free double category
- Concepts: quadratic algorithm', 'equality of diagrams', 'free double category', 'double category'

- Text: The translation is of interest in its own right since and can for instance be used to reason about double categories with the language of 2-categories, sidestepping the pinwheel problem
- Concepts: translation, double categories, 2-categories, pinwheel problem

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- Text: It also shows that although double categories are formally more general than 2-categories, they are not actually more expressive, explaining the rarity of applications of this notion.
- Concepts: double categories', '2-categories', 'expressive', 'notion'

- Text: This paper introduces ∞- and n-fold vector bundles as special functors from the ∞- and n-cube categories to the category of smooth manifolds
- Concepts: '∞-fold vector bundles', 'n-fold vector bundles', 'functors', '∞-cube categories', 'n-cube categories', 'smooth manifolds'

- Text: We study the cores and "n-pullbacks" of n-fold vector bundles and we prove that any n-fold vector bundle admits a non-canonical isomorphism to a decomposed n-fold vector bundle
- Concepts: 'n-fold vector bundle', 'cores', 'n-pullbacks', 'non-canonical isomorphism', 'decomposed n-fold vector bundle'

- Text: A colimit argument then shows that ∞-fold vector bundles admit as well non-canonical decompositions
- Concepts: 'colimit', '∞-fold vector bundles', 'non-canonical decompositions'

- Text: For the convenience of the reader, the case of triple vector bundles is discussed in detail.
- Concepts: triple vector bundles'

- Text: We construct three classes of generalised orbifolds of Reshetikhin-Turaev theory for a modular tensor category C, using the language of defect TQFT: (i) spherical fusion categories give orbifolds for the "trivial" defect TQFT associated to Vect, (ii) G-crossed extensions of C give group orbifolds for any finite group G, and (iii) we construct orbifolds from commutative Δ-separable Frobenius algebras in C
- Concepts: Reshetikhin-Turaev theory, modular tensor category, defect TQFT, spherical fusion categories, G-crossed extensions, finite group, commutative Δ-separable Frobenius algebras

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- Text: We also explain how the Turaev-Viro state sum construction fits into our framework by proving that it is isomorphic to the orbifold of case (i)

- Concepts: 'Turaev-Viro state sum construction', 'framework', 'orbifold', 'isomorphic', 'case (i)'

- Text: Moreover, we treat the cases (ii) and (iii) in the more general setting of ribbon tensor categories
- Concepts: 'ribbon tensor categories'

- Text: For case (ii) we show how Morita equivalence leads to isomorphic orbifolds, and we discuss Tambara-Yamagami categories as particular examples.
- Concepts: 'Morita equivalence', 'isomorphic', 'orbifolds', 'Tambara-Yamagami categories'

- Text: Suppose an extension map U: T_1 -> T_0 in the 2-category Con of contexts for arithmetic universes satisfies a Chevalley criterion for being an (op)fibration in Con
- Concepts: 'extension map', '2-category', 'contexts', 'arithmetic universes', 'Chevalley criterion', 'opfibration'

- Text: If M is a model of T_0 in an elementary topos S with nno, then the classifier p: S[T_1/M] -> S satisfies the representable definition of being an (op)fibration in the 2-category ETop of elementary toposes (with nno) and geometric morphisms.
- Concepts: 'model', 'elementary topos', 'nno', 'classifier', 'representable', 'fibration', '2-category', 'geometric morphisms'

- Text: In this paper we construct a symmetric monoidal closed model category of coherently commutative monoidal categories
- Concepts: 'symmetric monoidal closed', 'model category', 'coherently commutative', 'monoidal categories'

- Text: The main aim of this paper is to establish a Quillen equivalence between a model category of coherently commutative monoidal categories and a natural model category of Permutative (or strict symmetric monoidal) categories, Perm, which is not a symmetric monoidal closed model category
- Concepts: 'paper', 'Quillen equivalence', 'model category', 'coherently commutative', 'monoidal category', 'natural model category', 'Permutative', 'strict symmetric monoidal', 'not symmetric monoidal closed model category'

- Text: The right adjoint of this Quillen equivalence is the classical Segal's Nerve functor.
- Concepts: right adjoint, Quillen equivalence, nerve functor, Segal nerve functor

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- Text: We define exact sequences in the enchilada category of C*-algebras and correspondences, and prove that the reduced-crossed-product functor is not exact for the enchilada categories
- Concepts: 'exact sequences', 'C*-algebras', 'correspondences', 'reduced-crossed-product functor', 'enchilada categories'

- Text: Our motivation was to determine whether we can have a better understanding of the Baum-Connes conjecture by using enchilada categories
- Concepts: 'Baum-Connes conjecture', 'enchilada categories', 'understanding'

- Text: Along the way we prove numerous results showing that the enchilada category is rather strange.
- Concepts: 'enchilada category'

- Text: We construct combinatorial model category structures on the categories of (marked) categories and (marked) preadditive categories, and we characterize (marked) additive categories as fibrant objects in a Bousfield localization of preadditive categories
- Concepts: combinatorial model category, marked categories, preadditive categories, additive categories, fibrant objects, Bousfield localization

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- Text: These model category structures are used to present the corresponding infinity-categories obtained by inverting equivalences
- Concepts: 'model category', 'infinity-categories', 'equivalences', 'inverting'

- Text: We apply these results to explicitly calculate limits and colimits in these infinity-categories
- Concepts: 'limits', 'colimits', 'infinity-categories', 'calculate'

- Text: The motivating application is a systematic construction of the equivariant coarse algebraic K-homology with coefficients in an additive category from its non-equivariant version.
- Concepts: 'additive category', 'equivariant', 'coarse algebraic K-homology', 'non-equivariant version'

- Text: We generalize the notions of shifted double Poisson and shifted double Lie-Rinehart structures to monoids in a symmetric monoidal abelian category
- Concepts: 'shifted double Poisson', 'shifted double Lie-Rinehart', 'monoids', 'symmetric monoidal abelian category'

- Text: The main result is that an n-shifted double Lie-Rinehart structure on a pair (A,M) is equivalent to a non-shifted double Lie-Rinehart structure on the pair (A,M[-n]).
- Concepts: 'double Lie-Rinehart', 'n-shifted', 'non-shifted'

- Text: The goal of this article is to emphasize the role of cubical sets in enriched category theory and infinity-category theory
- Concepts: 'cubical sets', 'enriched category theory', 'infinity-category theory'

- Text: We show in particular that categories enriched in cubical sets provide a convenient way to describe many infinity-categories appearing in the context of homological algebra.
- Concepts: 'categories enriched in cubical sets', 'infinity-categories', 'homological algebra'

- Text: Let PreOrd(C) be the category of internal preorders in an exact category C
- Concepts: 'preorder', 'exact category'

- Text: We show that the pair (Eq(C),ParOrd(C)) is a pretorsion theory in PreOrd(C), where Eq(C) and ParOrd(C) are the full subcategories of internal equivalence relations and of internal partial orders in C, respectively
- Concepts: 'pretorsion theory', 'PreOrd(C)', 'internal equivalence relations', 'internal partial orders'

- Text: We observe that ParOrd(C) is a reflective subcategory of PreOrd(C) such that each component of the unit of the adjunction is a pullback-stable regular epimorphism
- Concepts: 'ParOrd', 'reflective subcategory', 'PreOrd', 'component', 'unit', 'adjunction', 'pullback-stable', 'regular epimorphism'

- Text: The reflector F: PreOrd(C) -> PardOrd(C) turns out to have stable units in the sense of Cassidy, Hébert and Kelly, thus inducing an admissible categorical Galois structure
- Concepts: 'PreOrd', 'PardOrd', 'stable units', 'admissible categorical Galois structure'

- Text: In particular, when C is the category Set of sets, we show that this reflection induces a monotone-light factorization system (in the sense of Carboni, Janelidze, Kelly and Paré) in PreOrd(Set)

- Concepts: 'category', 'Set', 'reflection', 'monotone-light factorization system', 'PreOrd'

- Text: A topological interpretation of our results in the category of Alexandroff-discrete spaces is also given, via the well-known isomorphism between this latter category and PreOrd(Set).
- Concepts: 'topological interpretation', 'category', 'Alexandroff-discrete spaces', 'isomorphism', 'PreOrd(Set)'

- Text: In this article the notion of virtual double category (also known as fc-multicategory) is extended as follows
- Concepts: 'virtual double category', 'fc-multicategory'

- Text: While cells in a virtual double category classically have a horizontal multi-source and single horizontal target, the notion of augmented virtual double category introduced here extends the latter notion by including cells with empty horizontal target as well. Any augmented virtual double category comes with a built-in notion of "locally small object" and we describe advantages of using augmented virtual double categories as a setting for formal category rather than 2-categories, which are classically equipped with a notion of "admissible object" by means of a yoneda structure in the sense of Street and Walters. An object is locally small precisely if it admits a horizontal unit, and we show that the notions of augmented virtual double category and virtual double category coincide in the presence of all horizontal units
- Concepts: 'virtual double category', 'augmented virtual double category', 'horizontal multi-source', 'horizontal target', 'locally

small object', 'formal category', '2-categories', 'admissible object', 'yoneda structure', 'horizontal unit'

- Text: Without assuming the existence of horizontal units we show that most of the basic theory for virtual double categories, such as that of restriction and composition of horizontal morphisms, extends to augmented virtual double categories
- Concepts: 'horizontal units', 'virtual double categories', 'restriction of horizontal morphisms', 'composition of horizontal morphisms', 'augmented virtual double categories'

- Text: We introduce and study in augmented virtual double categories the notion of "pointwise" composition of horizontal morphisms, which formalises the classical composition of profunctors given by the coend formula.
- Concepts: 'augmented virtual double categories', 'pointwise composition', 'horizontal morphisms', 'profunctors', 'coend formula'

- Text: We define the homology of a simplicial set with coefficients in a Segal's Gamma-set (s-module)
- Concepts: 'homology', 'simplicial set', 'coefficients', 'Segal's Gamma-set', 's-module'

- Text: We show the relevance of this new homology with values in s-modules by proving that taking as coefficients the s-modules at the archimedean place over the structure sheaf on Spec(Z), one obtains on the singular homology with real coefficients of a topological space X, a norm equivalent to the Gromov norm

- Concepts: 'homology', 's-modules', 'coefficients', 'archimedean place', 'structure sheaf', 'Spec(Z)', 'singular homology', 'real coefficients', 'topological space', 'norm', 'Gromov norm'

- Text: Moreover, we prove that the two norms agree when X is an oriented compact Riemann surface.
- Concepts: 'norms', 'oriented', 'compact', 'Riemann surface'

- Text: We derive three equivalent necessary conditions for a small category to have homological dimension one, generalizing a result of Novikov
- Concepts: 'small category', 'homological dimension'

- Text: As a consequence, any small cancellative category of homological dimension one is embeddable in a groupoid.
- Concepts: 'homological dimension', 'small cancellative category', 'embeddable', 'groupoid'

- Text: In this article we give necessary and sufficient conditions for a binary product to exist in a partial morphism category
- Concepts: 'binary product', 'partial morphism category', 'necessary conditions', 'sufficient conditions'

- Text: We also give necessary and sufficient conditions for the existence of a productive terminal in such categories.
- Concepts: 'productive terminal', 'existence', 'necessary and sufficient conditions', 'categories'

- Text: Persistence has proved to be a valuable tool to analyze real world data robustly
- Concepts: 'persistence', 'analyze', 'real world data'

- Text: Several approaches to persistence have been attempted over time, some topological in flavor, based on the vector space-valued homology functor, others combinatorial, based on arbitrary set-valued functors
- Concepts: 'persistence', 'topological', 'vector space-valued homology functor', 'combinatorial', 'set-valued functors'

- Text: To unify the study of topological and combinatorial persistence in a common categorical framework, we give axioms for a generalized rank function on objects in a target category so that functors to that category induce persistence functions
- Concepts: 'topological', 'combinatorial', 'persistence', 'categorical framework', 'axioms', 'generalized rank function', 'target category', 'functors', 'persistence functions'

- Text: We port the interleaving and bottleneck distances to this novel framework and generalize classical equalities and inequalities
- Concepts: 'interleaving distance', 'bottleneck distance', 'generalize', 'classical equalities', 'inequalities'

- Text: Unlike sets and vector spaces, in many categories the rank of an object does not identify it up to isomorphism: to preserve information about the structure of persistence modules, we define colorable ranks, persistence diagrams and prove the equality between multicolored bottleneck distance and interleaving distance in semisimple Abelian categories

- Concepts: 'categories', 'isomorphism', 'rank', 'persistence modules', 'colorable ranks', 'persistence diagrams', 'multicolored bottleneck distance', 'interleaving distance', 'semisimple Abelian categories'

- Text: To illustrate our framework in practice, we give examples of multicolored persistent homology on filtered topological spaces with a group action and labeled point cloud data.
- Concepts: 'persistent homology', 'filtered topological spaces', 'group action', 'labeled point cloud data'

- Text: We prove that, given any reflective subfibration L on an ∞-topos E, there exists a reflective subfibration L' on E whose local maps are the L-separated maps, that is, the maps whose diagonals are L-local.
- Concepts: 'reflective subfibration', '∞-topos', 'L-separated maps', 'diagonal', 'local maps'

- Text: We use the homotopy invariance of equivariant principal bundles to prove that the equivariant A-category of Clapp and Puppe is invariant under Morita equivalence
- Concepts: 'homotopy invariance', 'equivariant principal bundles', 'equivariant A-category', 'Morita equivalence'

- Text: As a corollary, we obtain that both the equivariant Lusternik-Schnirelmann category of a group action and the invariant topological complexity are invariant under Morita equivalence
- Concepts: 'corollary', 'equivariant', 'Lusternik-Schnirelmann category', 'group action', 'invariant', 'topological complexity', 'Morita equivalence'

- Text: This allows a definition of topological complexity for orbifolds.
- Concepts: 'topological complexity', 'orbifolds'

- Text: The term ``Boolean category'' should be used for describing an object that is to categories what a Boolean algebra is to posets
- Concepts: 'Boolean category', 'categories', 'Boolean algebra', 'posets'

- Text: More specifically, a Boolean category should provide the abstract algebraic structure underlying the proofs in Boolean Logic, in the same sense as a Cartesian closed category captures the proofs in intuitionistic logic and a *-autonomous category captures the proofs in linear logic
- Concepts: 'Boolean category', 'abstract algebraic structure', 'Boolean Logic', 'Cartesian closed category', 'intuitionistic logic', '*-autonomous category', 'linear logic', 'proofs'

- Text: However, recent work has shown that there is no canonical axiomatisation of a Boolean category
- Concepts: 'Boolean category', 'axiomatisation'

- Text: In this work, we will see a series (with increasing strength) of possible such axiomatisations, all based on the notion of *-autonomous category
- Concepts: '*-autonomous category', 'axiomatisations'

- Text: We will particularly focus on the medial map, which has its origin in an inference rule in KS, a cut-free deductive system for Boolean logic in the calculus of structures
- Concepts: 'medial map', 'inference rule', 'KS', 'cut-free deductive system', 'Boolean logic', 'calculus of structures'

- Text: Finally, we will present a category of proof nets as a particularly well-behaved example of a Boolean category.
- Concepts: 'category', 'proof nets', 'Boolean category'

- Text: We raise the question of saying what it means for a functor between abelian categories to preserve homology
- Concepts: 'functor', 'abelian categories', 'homology', 'preserve homology'

- Text: We give a kind of answer and explore the reasons it is unsatisfactory in general (although fine for left or right exact functors).
- Concepts: 'left exact functors', 'right exact functors'

- Text: A category C is additive if and only if, for every object B of C, the category Pt(C,B) of pointed objects in the comma category (C,B) is canonically equivalent to C
- Concepts: 'category', 'additive', 'object', 'comma category', 'pointed objects', 'canonically equivalent'

- Text: We reformulate the proof of this known result in order to obtain a stronger one that uses not all objects of B of C, but only a conveniently defined generating class S
- Concepts: 'reformulate', 'proof', 'known result', 'generating class'

- Text: If C is a variety of universal algebras, then one can take S to be the class consisting of any single free algebra on a non-empty set.
- Concepts: 'variety', 'universal algebras', 'free algebra', 'non-empty set'

- Text: Lawvere has urged a project of characterizing petit toposes which have the character of generalized spaces and gros toposes which have the character of categories of spaces
- Concepts: petit toposes', 'generalized spaces', 'gros toposes', 'categories of spaces'

- Text: Etendues and locally decidable toposes are seemingly petit and have a natural common generalization in sites with all idempotents identities
- Concepts: 'Etendues', 'locally decidable toposes', 'generalization', 'sites', 'idempotents identities'

- Text: This note shows every Grothendieck topos has such a site
- Concepts: 'Grothendieck topos', 'site'

- Text: More, it defines slanted products which take any site to an equivalent one way site, a site where all endomorphisms are identities
- Concepts: 'slanted products', 'site', 'endomorphisms', 'identities'

- Text: On the other hand subcanonical one-way sites are very special
- Concepts: 'subcanonical', 'one-way sites', 'special'

- Text: A site criterion for petit toposes will probably require subcanonical sites.
- Concepts: 'site criterion', 'petit toposes', 'subcanonical sites'

- Text: In this paper we explain the relationship between Frobenius objects in monoidal categories and adjunctions in 2-categories
- Concepts: 'Frobenius object', 'monoidal category', 'adjunction', '2-category'

- Text: Specifically, we show that every Frobenius object in a monoidal category M arises from an ambijunction (simultaneous left and right adjoints) in some 2-category $\mathcal{D}$ into which M fully and faithfully embeds
- Concepts: 'monoidal category', 'Frobenius object', 'ambijunction', 'left adjoints', 'right adjoints', '2-category'

- Text: Since a 2D topological quantum field theory is equivalent to a commutative Frobenius algebra, this result also shows that every 2D TQFT is obtained from an ambijunction in some 2-category
- Concepts: '2D topological quantum field theory', 'commutative Frobenius algebra', 'ambijunction', '2-category'

- Text: Our theorem is proved by extending the theory of adjoint monads to the context of an arbitrary 2-category and utilizing the free completion under Eilenberg-Moore objects
- Concepts: 'adjoint monads', '2-category', 'free completion', 'Eilenberg-Moore objects'

- Text: We then categorify this theorem by replacing the monoidal category M with a semistrict monoidal 2-category M, and replacing the 2-category $\mathcal{D}$ into which it embeds by a semistrict 3-category
- Concepts: 'monoidal category', 'semistrict monoidal 2-category', '2-category', 'semistrict 3-category'

- Text: To state this more powerful result, we must first define the notion of a `Frobenius pseudomonoid', which categorifies that of a Frobenius object
- Concepts: 'Frobenius pseudomonoid', 'categorify', 'Frobenius object'

- Text: We then define the notion of a `pseudo ambijunction', categorifying that of an ambijunction

- Concepts: 'notion', 'pseudo ambijunction', 'categorifying', 'ambijunction'

- Text: In each case, the idea is that all the usual axioms now hold only up to coherent isomorphism
- Concepts: 'axioms', 'coherent isomorphism'

- Text: Finally, we show that every Frobenius pseudomonoid in a semistrict monoidal 2-category arises from a pseudo ambijunction in some semistrict 3-category.
- Concepts: 'Frobenius pseudomonoid', 'semistrict monoidal 2-category', 'pseudo ambijunction', 'semistrict 3-category'

- Text: A flow is homotopy continuous if it is indefinitely divisible up to S-homotopy
- Concepts: 'flow', 'homotopy continuous', 'indefinitely divisible', 'S-homotopy'

- Text: The full subcategory of cofibrant homotopy continuous flows has nice features
- Concepts: 'cofibrant', 'homotopy', 'continuous', 'flows'

- Text: Not only it is big enough to contain all dihomotopy types, but also a morphism between them is a weak dihomotopy equivalence if and only if it is invertible up to dihomotopy
- Concepts: 'dihomotopy types', 'morphism', 'weak dihomotopy equivalence', 'invertible', 'dihomotopy'

- Text: Thus, the category of cofibrant homotopy continuous flows provides an implementation of Whitehead's theorem for the full dihomotopy relation, and not only for S-homotopy as in previous works of the author
- Concepts: 'category', 'cofibrant', 'homotopy', 'continuous flows', 'Whitehead's theorem', 'dihomotopy relation', 'S-homotopy'

- Text: This fact is not the consequence of the existence of a model structure on the category of flows because it is known that there does not exist any model structure on it whose weak equivalences are exactly the weak dihomotopy equivalences
- Concepts: 'model structure', 'category of flows', 'weak equivalences', 'weak dihomotopy equivalences'

- Text: This fact is an application of a general result for the localization of a model category with respect to a weak factorization system.
- Concepts: 'localization', 'model category', 'weak factorization system'

- Text: We give here some examples of non pointed protomodular categories $\mathbb C$ satisfying a property similar to the property of representation of actions which holds for the pointed protomodular category Gp of groups: any slice category of Gp, any category of groupoids with a fixed set of objects, any essentially affine category
- Concepts: 'protomodular categories', 'representation', 'actions', 'pointed protomodular category', 'groups', 'slice category',

'groupoids', 'essentially affine category'

- Text: This property gives rise to an internal construction of the center of any object X, and consequently to a specific characterization of the abelian objects in $\mathbb C$.
- Concepts: 'internal construction', 'center', 'object', 'abelian objects', '$\mathbb C$'

- Text: The paper generalizes the notion of a congruence on a category and pursues some of its applications
- Concepts: 'congruence', 'category', 'applications'

- Text: In particular, generalized congruences are used to provide a concrete construction of coequalizers in ${\cal C}at$
- Concepts: concrete construction, coequalizers, ${\cal C}at$, generalized congruences

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- Text: Extremal, regular and various other classes of epimorphic functors are characterized and inter-related.
- Concepts: 'extremal', 'regular', 'epimorphic functors', 'characterized', 'inter-related'

- Text: We prove that certain categories arising from atoms in a Grothendieck topos are themselves Grothendieck toposes
- Concepts: 'categories', 'Grothendieck topos', 'atoms'

- Text: We also investigate enrichments of these categories over the base topos; there are in fact often two distinct enrichments.

- Concepts: 'enrichments', 'categories', 'base topos', 'distinct enrichments'

- Text: A category may bear many monoidal structures, but (to within a unique isomorphism) only one structure of `category with finite products'
- Concepts: 'category', 'monoidal structures', 'finite products'

- Text: To capture such distinctions, we consider on a 2-category those 2-monads for which algebra structure is essentially unique if it exists, giving a precise mathematical definition of `essentially unique' and investigating its consequences
- Concepts: '2-category', '2-monads', 'algebra structure', 'essentially unique', 'mathematical definition'

- Text: We call such 2-monads property-like
- Concepts: 2-monads

- Text: We further consider the more restricted class of fully property-like 2-monads, consisting of those property-like 2-monads for which all 2-cells between (even lax) algebra morphisms are algebra 2-cells
- Concepts: '2-monads', 'property-like 2-monads', 'lax algebra morphisms', 'algebra 2-cells'

- Text: The consideration of lax morphisms leads us to a new characterization of those monads, studied by Kock and Zoberlein, for which `structure is adjoint to unit', and which we now call lax-idempotent 2-monads: both these and their colax-idempotent duals are fully property-like

- Concepts: 'lax morphisms', 'monads', 'structure', 'adjoint', 'unit', 'lax-idempotent', '2-monads', 'colax-idempotent', 'fully property-like'

- Text: We end by showing that (at least for finitary 2-monads) the classes of property-likes, fully property-likes, and lax-idempotents are each coreflective among all 2-monads.
- Concepts: 'finitary 2-monads', 'property-likes', 'fully property-likes', 'lax-idempotents', 'coreflective'

- Text: Given a bicategory, 2, with stable local coequalizers, we construct a bicategory of monads Y-mnd by using lax functors from the generic 0-cell, 1-cell and 2-cell, respectively, into Y
- Concepts: 'bicategory', 'stable local coequalizers', 'monads', 'lax functors'

- Text: Any lax functor into Y factors through Y-mnd and the 1-cells turn out to be the familiar bimodules
- Concepts: 'lax functor', 'factors through', 'Y-mnd', '1-cells', 'bimodules'

- Text: The locally ordered bicategory rel and its bicategory of monads both fail to be Cauchy-complete, but have a well-known Cauchy-completion in common
- Concepts: 'locally ordered bicategory', 'bicategory of monads', 'Cauchy-complete', 'Cauchy-completion'

- Text: This prompts us to formulate a concept of Cauchy-completeness for bicategories that are not locally ordered and suggests a weakening of the notion of monad
- Concepts: 'Cauchy-completeness', 'bicategories', 'locally ordered', 'weakening', 'monad'

- Text: For this purpose, we develop a calculus of general modules between unstructured endo-1-cells
- Concepts: 'calculus', 'modules', 'unstructured endo-1-cells'

- Text: These behave well with respect to composition, but in general fail to have identities
- Concepts: composition', 'identities'

- Text: To overcome this problem, we do not need to impose the full structure of a monad on endo-1-cells
- Concepts: 'monad', 'endo-1-cells'

- Text: We show that associative coequalizing multiplications suffice and call the resulting structures interpolads
- Concepts: associative coequalizing multiplications', 'interpolads'

- Text: Together with structure-preserving i-modules these form a bicategory Y-int that is indeed Cauchy-complete, in our sense, and contains the bicategory of monads as a not necessarily full sub-bicategory
- Concepts: i-modules, bicategory, Cauchy-complete, monads, sub-bicategory

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- Text: Interpolads over rel are idempotent relations, over the suspension of set they correspond to interpolative semi-groups, and over spn they lead to a notion of ``category without identities'' also known as ``taxonomy''
- Concepts: 'Interpolads', 'rel', 'idempotent relations', 'suspension of set', 'interpolative semi-groups', 'spn', 'category without identities', 'taxonomy'

- Text: If Y locally has equalizers, then modules in general, and the bicategories Y-mnd and Y-int in particular, inherit the property of being closed with respect to 1-cell composition.
- Concepts: 'equalizers', 'modules', 'bicategories', '1-cell composition', 'closed'

- Text: For m >= n > 0, a map f between pointed spaces is said to be a weak [n,m]-equivalence if f induces isomorphisms of the homotopy groups \pi_k for n <= k <= m~
- Concepts: 'map', 'pointed spaces', 'homotopy groups', 'weak [n,m-equivalence', 'isomorphisms'

- Text: Associated with this notion we give two different closed model category structures to the category of pointed spaces
- Concepts: 'notion', 'closed model category structures', 'category of pointed spaces'

- Text: Both structures have the same class of weak equivalences but different classes of fibrations and therefore of cofibrations
- Concepts: 'weak equivalences', 'fibrations', 'cofibrations'

- Text: Using one of these structures, one obtains that the localized category is equivalent to the category of n-reduced CW-complexes with dimension less than or equal to m+1 and m-homotopy classes of cellular pointed maps
- Concepts: 'localized category', 'n-reduced CW-complexes', 'dimension', 'homotopy classes', 'cellular', 'pointed maps'

- Text: Using the other structure we see that the localized category is also equivalent to the homotopy category of (n-1)-connected (m+1)-coconnected CW-complexes.
- Concepts: 'localized category', 'homotopy category', '(n-1)-connected', '(m+1)-coconnected', 'CW-complexes'

- Text: In this paper, we construct a neat description of the passage from crossed squares of commutative algebras to 2-crossed modules analogous to that given by Conduche in the group case
- Concepts: 'crossed squares', 'commutative algebras', '2-crossed modules', 'Conduche', 'group case'

- Text: We also give an analogue, for commutative algebra, of T
- Concepts: 'commutative algebra', 'analogue'

- Text: Porter's simplicial groups to n-cubes of groups which implies an inverse functor to Conduche's one.
- Concepts: 'simplicial groups', 'n-cubes of groups', 'inverse functor'

- Text: We give a precise characterization for when the models of the tensor product of sketches are structurally isomorphic to the models of either sketch in the models of the other
- Concepts: 'tensor product', 'sketches', 'models', 'structurally isomorphic'

- Text: For each base category K call the just mentioned property (sketch) K-multilinearity
- Concepts: 'base category', 'K-multilinearity'

- Text: Say that two sketches are K-compatible with respect to base category K just in case in each K-model, the limits for each limit specification in each sketch commute with the colimits for each colimit specification in the other sketch and all limits and colimits are pointwise
- Concepts: 'sketches', 'compatible', 'base category', 'K-model', 'limits', 'limit specification', 'colimits', 'colimit specification', 'pointwise'

- Text: Two sketches are K-multilinear if and only if the two sketches are K-compatible
- Concepts: 'sketches', 'K-multilinear', 'K-compatible'

- Text: This property then extends to strong Colimits of sketches. We shall use the technically useful property of limited completeness and completeness of every category of models of sketches

- Concepts: 'Colimits', 'sketches', 'limited completeness', 'completeness', 'category', 'models'

- Text: That is, categories of sketch models have all limits commuting with the sketched colimits and and all colimits commuting with the sketched limits
- Concepts: 'categories', 'limits', 'colimits', 'sketch models', 'sketched limits', 'sketched colimits'

- Text: Often used implicitly, the precise statement of this property and its proof appears here.
- Concepts: property, proof (no math concepts mentioned)

- Text: Each full reflective subcategory X of a finitely-complete category C gives rise to a factorization system (E, M) on C, where E consists of the morphisms of C inverted by the reflexion I : C --> X
- Concepts: 'full reflective subcategory', 'finely-complete category', 'factorization system', 'morphisms', 'reflexion'

- Text: Under a simplifying assumption which is satisfied in many practical examples, a morphism f : A --> B lies in M precisely when it is the pullback along the unit \etaB : B --> IB of its reflexion If : IA --> IB; whereupon f is said to be a trivial covering of B
- Concepts: morphsim, pullback, unit, reflexion, trivial covering

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- Text: Finally, the morphism f : A --> B is said to be a covering of B if, for some effective descent morphism p : E --> B, the pullback p^*f of f along p is a trivial covering of E
- Concepts: 'morphism', 'covering', 'pullback', 'effective descent morphism', 'trivial covering'

- Text: This is the absolute notion of covering; there is also a more general relative one, where some class \Theta of morphisms of C is given, and the class Cov(B) of coverings of B is a subclass -- or rather a subcategory -- of the category C \downarrow B \subset C/B whose objects are those f : A --> B with f in \Theta
- Concepts: 'covering', 'relative', 'morphisms', 'class', 'subclass', 'subcategory', 'category', 'objects'

- Text: Many questions in mathematics can be reduced to asking whether Cov(B) is reflective in C \downarrow B; and we give a number of disparate conditions, each sufficient for this to be so
- Concepts: mathematics, Cov(B), reflective, C \downarrow B, disparate conditions

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- Text: In this way we recapture old results and establish new ones on the reflexion of local homeomorphisms into coverings, on the Galois theory of commutative rings, and on generalized central extensions of universal algebras.
- Concepts: 'local homeomorphisms', 'coverings', 'Galois theory', 'commutative rings', 'generalized central extensions', 'universal algebras'

- Text: We define a localization L of a category E to be quintessential if the left adjoint to the inclusion functor is also right adjoint to it, and persistent if L is closed under subobjects in E
- Concepts: 'localization', 'category', 'left adjoint', 'inclusion functor', 'right adjoint', 'persistent', 'closed under subobjects'

- Text: We show that quintessential localizations of an arbitrary Cauchy-complete category correspond to idempotent natural endomorphisms of its identity functor, and that they are necessarily persistent
- Concepts: 'idempotent natural endomorphisms', 'Cauchy-complete category', 'quintessential localizations'

- Text: Our investigation of persistent localizations is largely restricted to the case when E is a topos: we show that persistence is equivalence to the closure of L under finite coproducts and quotients, and that it implies that L is coreflective as well as reflective, at least provided E admits a geometric morphism to a Boolean topos
- Concepts: 'persistent localizations', 'topos', 'finite coproducts', 'quotients', 'coreflective', 'reflective', 'geometric morphism', 'Boolean topos'

- Text: However, we provide examples to show that the reflector and coreflector need not coincide.
- Concepts: 'reflector', 'coreflector'

- Text: We analyze the Bianchi Identity as an instance of a basic fact of combinatorial groupoid theory, related to the Homotopy Addition Lemma
- Concepts: 'Bianchi Identity', 'combinatorial groupoid theory', 'Homotopy Addition Lemma'

- Text: Here it becomes formulated in terms of 2-forms with values in the gauge group bundle of a groupoid, and leads in particular to the (Chern-Weil) construction of characteristic classes
- Concepts: '2-forms', 'gauge group bundle', 'groupoid', 'Chern-Weil', 'characteristic classes'

- Text: The method is that of synthetic differential geometry, using "the first neighbourhood of the diagonal" of a manifold as its basic combinatorial structure
- Concepts: 'synthetic differential geometry', 'manifold', 'neighbourhood of the diagonal', 'combinatorial structure'

- Text: We introduce as a tool a new and simple description of wedge (= exterior) products of differential forms in this context.
- Concepts: 'wedge product', 'exterior product', 'differential forms'

- Text: Results on the finiteness of induced crossed modules are proved both algebraically and topologically
- Concepts: 'crossed modules', 'induced crossed modules', 'finiteness', 'algebraically', 'topologically'

- Text: Using the Van Kampen type theorem for the fundamental crossed module, applications are given to the 2-types of mapping cones of classifying spaces of groups
- Concepts: 'Van Kampen type theorem', 'fundamental crossed module', 'mapping cones', 'classifying spaces', 'groups'

- Text: Calculations of the cohomology classes of some finite crossed modules are given, using crossed complex methods.
- Concepts: 'cohomology classes', 'finite crossed modules', 'crossed complex methods'

- Text: The classical infinite loopspace machines in fact induce an equivalence of categories between a localization of the category of symmetric monoidal categories and the stable homotopy category of -1-connective spectra.
- Concepts: 'infinite loopspace', 'equivalence of categories', 'localization', 'symmetric monoidal categories', 'stable homotopy category', '-1-connective spectra'

- Text: Strong promonoidal functors are defined
- Concepts: promonoidal functors'

- Text: Left Kan extension (also called "existential quantification") along a strong promonoidal functor is shown to be a strong monoidal functor
- Concepts: 'Left Kan extension', 'existential quantification', 'strong promonoidal functor', 'strong monoidal functor'

- Text: A construction for the free monoidal category on a promonoidal category is provided
- Concepts: 'free monoidal category', 'promonoidal category'

- Text: A Fourier-like transform of presheaves is defined and shown to take convolution product to cartesian product.
- Concepts: 'Fourier-like transform', 'presheaves', 'convolution product', 'cartesian product'

- Text: In this paper we study the lattice of quantic conuclei for orthomudular lattices
- Concepts: 'lattice', 'quantic conuclei', 'orthomodular lattices'

- Text: We show that under certain condition we can get a complete characterization of all quantic conuclei
- Concepts: 'complete characterization', 'quantic', 'conuclei'

- Text: The thing to note is we use a non commutative, non associative disjunction operation which can be thought of as non commutative, non associative linear logic.
- Concepts: 'non commutative', 'non associative', 'disjunction operation', 'linear logic'

- Text: We discuss two versions of a conjecture attributed to M
- Concepts: conjecture'

- Text: Barr

- Concepts: No math concepts mentioned in the given context. It only states a name "Barr".

- Text: The Harrison cohomology of a commutative algebra is known to coincide with the Andre/Quillen cohomology over a field of characteristic zero but not in prime characteristics
- Concepts: Harrison cohomology, commutative algebra, Andre-Quillen cohomology, field of characteristic zero, prime characteristics

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- Text: The conjecture is that a modified version of Harrison cohomology, taking into account torsion, always agrees with Andre/Quillen cohomology
- Concepts: 'Harrison cohomology', 'torsion', 'Andre/Quillen cohomology'

- Text: We give a counterexample.
- Concepts: counterexample'

- Text: The purpose is to give a simple proof that a category is equivalent to a small category if and only if both it and its presheaf category are locally small.
- Concepts: 'category', 'small category', 'presheaf category', 'locally small'

- Text: We introduce MD-sketches, which are a particular kind of Finite Sum sketches
- Concepts: MD-sketches', 'Finite Sum sketches'

- Text: Two interesting results about MD-sketches are proved
- Concepts: 'MD-sketches'

- Text: First, we show that, given two MD-sketches, it is algorithmically decidable whether their model categories are equivalent
- Concepts: 'MD-sketches', 'algorithmically decidable', 'model categories', 'equivalent'

- Text: Next we show that data-specifications, as used in database-design and software engineering, can be translated to MD-sketches
- Concepts: 'data-specifications', 'database-design', 'software engineering', 'MD-sketches'

- Text: As a corollary, we obtain that equivalence of data-specifications is decidable.
- Concepts: 'equivalence', 'decidable', 'data-specifications'

- Text: The Medial rule was first devised as a deduction rule in the Calculus of Structures
- Concepts: Medial rule, deduction rule, Calculus of Structures

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- Text: In this paper we explore it from the point of view of category theory, as additional structure on a *-autonomous category
- Concepts: 'category theory', '*-autonomous category', 'additional structure'

- Text: This gives us some insights on the denotational semantics of classical propositional logic, and allows us to construct new models for it, based on suitable generalizations of the theory of coherence spaces.
- Concepts: 'denotational semantics', 'propositional logic', 'models', 'generalizations', 'coherence spaces', 'theory'

- Text: Tilings of rectangles with rectangles, and tileorders (the associated double order structures) are useful as ``templates'' for composition in double categories
- Concepts: tilings, rectangles, tileorders, double order structures, composition, double categories

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- Text: In this context, it is particularly relevant to ask which tilings may be joined together, two rectangles at a time, to form one large rectangle
- Concepts: tilings, rectangles, joined together, large rectangle

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- Text: We characterize such tilings via forbidden suborders, in a manner analogous to Kuratowski's characterization of planar graphs.
- Concepts: 'tilings', 'forbidden suborders', 'Kuratowski's characterization', 'planar graphs'

- Text: We formulate three slightly different notions of oriented singular chain complexes and show that all three are naturally homotopic to ordinary singular chain complexes.

- Concepts: 'oriented singular chain complexes', 'homotopic', 'ordinary singular chain complexes'

- Text: In 1975 E
- Concepts: None provided. The context alone cannot be used to extract math concepts.

- Text: M
- Concepts: There are no math concepts mentioned in the given context. More information is needed.

- Text: Brown constructed a functor $\cal P$ which carries the tower of fundamental groups of the end of a (nice) space to the Brown-Grossman fundamental group
- Concepts: 'functor', 'tower of fundamental groups', 'end of a space', 'Brown-Grossman fundamental group'

- Text: In this work, we study this functor and its extensions and analogues defined for pro-sets, pro-pointed sets, pro-groups and pro-abelian groups
- Concepts: 'functor', 'extensions', 'analogues', 'pro-sets', 'pro-pointed sets', 'pro-groups', 'pro-abelian groups'

- Text: The new versions of the $\cal P$ functor are provided with more algebraic structure
- Concepts: 'functor', '$\cal P$', 'algebraic structure'

- Text: Examples given in the paper prove that in general the $\cal P$ functors are not faithful, however, one of our main results establishes that the restrictions of the corresponding $\cal P$ functors to the full subcategories of towers are faithful
- Concepts: 'functors', '$\cal P$ functors', 'faithful', 'restrictions', 'full subcategories', 'towers'

- Text: We also prove that the restrictions of the $\cal P$ functors to the corresponding full subcategories of finitely generated towers are also full
- Concepts: 'functors', 'full subcategories', 'finitely generated towers'

- Text: Consequently, in these cases, the towers of objects in the categories of sets, pointed sets, groups and abelian groups, can be replaced by adequate algebraic models (M-sets, M-pointed sets, near-modules and modules.) The article also contains the construction of left adjoints for the $\cal P$ functors.
- Concepts: 'categories', 'sets', 'pointed sets', 'groups', 'abelian groups', 'algebraic models', 'modules', 'left adjoints', 'functors'

- Text: Free regular and exact completions of categories with various ranks of weak limits are presented as subcategories of presheaf categories
- Concepts: 'regular completion', 'exact completion', 'categories', 'weak limits', 'presheaf categories', 'subcategories'

- Text: Their universal properties can then be derived with standard techniques as used in duality theory.
- Concepts: 'universal properties', 'standard techniques', 'duality theory'

- Text: For an adjoint string V -| W -| X -| Y : B --> C, with Y fully faithful, it is frequently, but not always, the case that the composite VY underlies an idempotent monad
- Concepts: 'adjoint string', 'fully faithful', 'composite', 'underlies', 'idempotent monad'

- Text: When it does, we call the string distributive
- Concepts: 'distributive', 'string'

- Text: We also study shorter and longer `distributive' adjoint strings and how to generate them
- Concepts: 'distributive', 'adjoint', 'strings', 'generate'

- Text: These provide a new construction of the simplicial 2-category, Delta.
- Concepts: 'simplicial', '2-category', 'Delta', 'construction'

- Text: We prove how any (elementary) topos may be reconstructed from the data of two complemented subtoposes together with a pair of left exact ``glueing functors''
- Concepts: 'elementary topos', 'complemented subtoposes', 'left exact', 'glueing functors'

- Text: This generalizes the classical glueing theorem for toposes, which deals with the special case of an open subtopos and its closed complement. Our glueing analysis applies in a particularly simple form to a locally closed subtopos and its complement, and one of the important properties (prolongation by zero for abelian groups) can be succinctly described in terms of it.
- Concepts: 'glueing theorem', 'toposes', 'open subtopos', 'closed complement', 'locally closed subtopos', 'prolongation by zero', 'abelian groups'

- Text: Locally finitely presentable categories are known to be precisely the categories of models of essentially algebraic theories, i.e., categories of partial algebras whose domains of definition are determined by equations in total operations
- Concepts: 'locally finitely presentable categories', 'models of essentially algebraic theories', 'partial algebras', 'domains of definition', 'equations', 'total operations'

- Text: Here we show an analogous description of locally finitely multipresentable categories
- Concepts: 'locally finitely multipresentable categories'

- Text: We also prove that locally finitely multipresentable categories are precisely categories of models of sketches with finite limit and countable coproduct specifications, and we present an example of a locally finitely multipresentable category not sketchable by a sketch with finite limit and finite colimit specifications.

- Concepts: 'locally finitely multipresentable categories', 'models of sketches', 'finite limit', 'countable coproduct specifications', 'finite colimit specifications'

- Text: Some sufficient conditions for finiteness of a generalized non-abelian tensor product of groups are established extending Ellis' result for compatible actions.
- Concepts: 'finiteness', 'non-abelian tensor product', 'groups', 'compatible actions', 'Ellis result'

- Text: We take another look at the Chu construction and show how to simplify it by looking at it as a module category in a trivial Chu category
- Concepts: 'Chu construction', 'module category', 'trivial Chu category'

- Text: This simplifies the construction substantially, especially in the case of a non-symmetric biclosed monoidal category
- Concepts: simplifies, construction, non-symmetric, biclosed monoidal category

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- Text: We also show that if the original category is accessible, then for any of a large class of ``polynomial-like'' functors, the category of coalgebras has cofree objects.
- Concepts: 'category', 'accessible', 'polynomial-like functor', 'coalgebra', 'cofree objects'

- Text: We obtain some explicit calculations of crossed Q-modules induced from a crossed module over a normal subgroup P of Q
- Concepts: 'crossed Q-modules', 'crossed module', 'normal subgroup', 'induced', 'calculations'

- Text: By virtue of theorems of Brown and Higgins, this enables the computation of the homotopy 2-types and second homotopy modules of certain homotopy pushouts of maps of classifying spaces of discrete groups.
- Concepts: 'theorems of Brown and Higgins', 'homotopy 2-types', 'second homotopy modules', 'homotopy pushouts', 'classifying spaces', 'discrete groups'

- Text: This note applies techniques we have developed to study coherence in monoidal categories with two tensors, corresponding to the tensor-par fragment of linear logic, to several new situations, including Hyland and de Paiva's Full Intuitionistic Linear Logic (FILL), and Lambek's Bilinear Logic (BILL)
- Concepts: 'monoidal category', 'two tensors', 'linear logic', 'coherence', 'tensor-par fragment', 'Intuitionistic Linear Logic', 'Full Intuitionistic Linear Logic', 'Bilinear Logic'

- Text: Note that the latter is a noncommutative logic; we also consider the noncommutative version of FILL
- Concepts: 'noncommutative logic', 'noncommutative version', 'FILL'

- Text: The essential difference between FILL and BILL lies in requiring that a certain tensorial strength be an isomorphism
- Concepts: tensorial strength, isomorphism

- Text: In any FILL category, it is possible to isolate a full subcategory of objects (the ``nucleus'') for which this transformation is an isomorphism
- Concepts: 'FILL category', 'full subcategory', 'objects', 'transformation', 'isomorphism'

- Text: In addition, we define and study the appropriate categorical structure underlying the MIX rule
- Concepts: 'categorical structure', 'MIX rule'

- Text: For all these structures, we do not restrict consideration to the ``pure'' logic as we allow non-logical axioms
- Concepts: 'logic', 'non-logical axioms', 'structures'

- Text: We define the appropriate notion of proof nets for these logics, and use them to describe coherence results for the corresponding categorical structures.
- Concepts: 'proof nets', 'logics', 'coherence', 'categorical structures'

- Text: We establish a general coherence theorem for lax operad actions on an n-category which implies that an n-category with such an action is lax equivalent to one with a strict action

- Concepts: 'coherence theorem', 'lax operad', 'n-category', 'lax equivalent', 'strict action'

- Text: This includes familiar coherence results (e.g
- Concepts: 'coherence results'

- Text: for symmetric monoidal categories) and many new ones
- Concepts: 'symmetric monoidal categories'

- Text: In particular, any braided monoidal n-category is lax equivalent to a strict braided monoidal n-category
- Concepts: 'braided monoidal n-category', 'lax equivalent', 'strict braided monoidal n-category'

- Text: We also obtain coherence theorems for A_{\infty} and E_{\infty} rings and for lax modules over such rings
- Concepts: coherence theorems', 'A_{\infty} rings', 'E_{\infty} rings', 'lax modules'

- Text: Using these results we give an extension of Morita equivalence to A_{\infty} rings and some applications to infinite loop spaces and algebraic K-theory.
- Concepts: 'Morita equivalence', 'A_{\infty} rings', 'infinite loop spaces', 'algebraic K-theory'

- Text: In a 1981 book, H
- Concepts: None, as the context is incomplete and does not mention any math concepts.

- Text: Putnam claimed that in a pure relational language without equality, for any model of a relation that was neither empty nor full, there was another model that satisfies the same first order sentences
- Concepts: relational language, model, relation, first order sentences

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- Text: Ed Keenan observed that this was false for finite models since equality is a definable predicate in such cases
- Concepts: equality, definable predicate, finite models

- Text: This note shows that Putnam's claim is true for infinite models, although it requires a more sophisticated proof than the one outlined by Putnam.
- Concepts: 'Putnam's claim', 'infinite models', 'sophisticated proof'

- Text: We pursue the definition of a KZ-doctrine in terms of a fully faithful adjoint string Dd -| m -| dD
- Concepts: 'KZ-doctrine', 'fully faithful', 'adjoint string'

- Text: We give the definition in any Gray-category
- Concepts: 'Gray-category', 'definition'

- Text: The concept of algebra is given as an adjunction with invertible counit
- Concepts: 'algebra', 'adjunction', 'invertible counit'

- Text: We show that these doctrines are instances of more general pseudomonads
- Concepts: 'pseudomonads', 'general pseudomonads'

- Text: The algebras for a pseudomonad are defined in more familiar terms and shown to be the same as the ones defined as adjunctions when we start with a KZ-doctrine.
- Concepts: 'algebras', 'pseudomonad', 'adjunctions', 'KZ-doctrine'

- Text: Let E be a simplicial commutative algebra such that E_n is generated by degenerate elements
- Concepts: 'simplicial commutative algebra', 'degenerate elements', 'generated'

- Text: It is shown that in this case the n^th term of the Moore complex of E is generated by images of certain pairings from lower dimensions
- Concepts: 'Moore complex', 'n^th term', 'generated', 'images', 'pairings', 'lower dimensions'

- Text: This is then used to give a description of the boundaries in dimension n-1 for n = 2, 3, and 4.
- Concepts: 'description', 'boundaries', 'dimension', 'n-1', 'n=2', 'n=3', 'n=4'

- Text: The notion of {\em separable} (alternatively {\em unramified}, or {\em decidable}) objects and their place in a categorical theory of space have been described by Lawvere (see

\cite{lawvere:como}), drawing on notions of separable from algebra and unramified from geometry
- Concepts: 'separable', 'unramified', 'decidable', 'categorical theory', 'space', 'Lawvere', 'algebra', 'geometry'

- Text: In \cite{schanuel:halifax}, Schanuel constructed the generic separable object in an extensive category with products as an object of the free category with finite sums on the dual of the category of finite sets and injections. We present here a generalization of the work of \cite{schanuel:halifax}, replacing the category of finite sets and injections by a category $\cat A$ with a suitable factorization system
- Concepts: 'extensive category', 'products', 'free category with finite sums', 'dual', 'category of finite sets', 'injections', 'generalization', 'category', 'factorization system'

- Text: We describe the analogous construction, and identify and prove a universal property of the constructed category for both extensive categories and extensive categories with products (in the case $\cat A$ admits sums). In constructing the machinery for proving the required universal property, we recall briefly the boolean algebra structure of the summands of an object in an extensive category
- Concepts: 'category', 'extensive category', 'products', 'sums', 'universal property', 'boolean algebra structure', 'object'

- Text: We further present a notion of direct image for certain maps in an extensive category, to allow construction of left adjoints to the inverse image maps obtained from pullbacks. Please note the electronically available References at http://www.tac.mta.ca/tac/volumes/1998/n10/reference.html

- Concepts: 'direct image', 'extensive category', 'left adjoints', 'inverse image maps', 'pullbacks'

- Text: In terms of synthetic differential geometry, we give a variational characterization of the connection (parallelism) associated to a pseudo-Riemannian metric on a manifold.
- Concepts: 'synthetic differential geometry', 'variational characterization', 'connection', 'parallelism', 'pseudo-Riemannian metric', 'manifold'

- Text: Using free simplicial groups, it is shown how to construct a free or totally free 2-crossed module on suitable construction data
- Concepts: 'simplicial groups', 'construct', 'free 2-crossed module', 'totally free 2-crossed module', 'construction data'

- Text: 2-crossed complexes are introduced and similar freeness results for these are discussed. Please note the electronically available References at http://www.tac.mta.ca/tac/volumes/1998/n8/reference.html
- Concepts: '2-crossed complex', 'freeness results'

- Text: Generalising a result of Brown and Loday, we give for n=3 and 4, a decomposition of the group, d_nNG_n, of boundaries of a simplicial group G as a product of commutator subgroups

- Concepts: 'simplicial group', 'group', 'decomposition', 'commutator subgroups'

- Text: Partial results are given for higher dimensions
- Concepts: 'higher dimensions'

- Text: Applications to 2-crossed modules and quadratic modules are discussed. Please note the electronically available References at http://www.tac.mta.ca/tac/volumes/1998/n7/reference.html
- Concepts: '2-crossed modules', 'quadratic modules'

- Text: This paper shows that, given a factorization system, E/M on a closed symmetric monoidal category, the full subcategory of separated extensional objects of the Chu category is also star-autonomous under weaker conditions than had been given previously ([Barr, 1991])
- Concepts: factorization system, closed symmetric monoidal category, separated extensional objects, Chu category, star-autonomous, Barr

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- Text: In the process we find conditions under which the intersection of a full reflective subcategory and its coreflective dual in a Chu category is star-autonomous.
- Concepts: 'intersection', 'reflective subcategory', 'coreflective dual', 'Chu category', 'star-autonomous'

- Text: We introduce a notion of equipment which generalizes the earlier notion of pro-arrow equipment and includes such familiar constructs as $\rel\K$, $\spn\K$, $\par\K$, and $\pro\K$ for a suitable category $\K$, along with related constructs such as the $\V$-$\pro$ arising from a suitable monoidal category $\V$
- Concepts: 'equipment', 'pro-arrow equipment', '$\rel\K$', '$\spn\K$', '$\par\K$', '$\pro\K$', 'category', '$\V$', 'monoidal category'

- Text: We further exhibit the equipments as the objects of a 2-category, in such a way that arbitrary functors $F:\eL ---> \K$ induce equipment arrows $\rel F:\rel\eL --->\rel\K$, $\spn F:\spn\eL ---> \spn\K$, and so on, and similarly for arbitrary monoidal functors $\V ---> \W$
- Concepts: 2-category, objects, functors, arrows, monoidal functors

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- Text: The article I with the title above dealt with those equipments $\M$ having each $\M(A,B)$ only an ordered set, and contained a detailed analysis of the case $\M =\rel\K$; in the present article we allow the $\M(A,B)$ to be general categories, and illustrate our results by a detailed study of the case $\M=\spn\K$
- Concepts: ordered set, category, detailed analysis, study

- Text: We show in particular that $\spn$ is a locally-fully-faithful 2-functor to the 2-category of equipments, and determine its image on arrows

- Concepts: $\spn$, 'locally-fully-faithful', '2-functor', '2-category', 'equipments', 'image on arrows'

- Text: After analyzing the nature of adjunctions in the 2-category of equipments, we are able to give a simple characterization of those $\spn G$ which arise from a geometric morphism G.
- Concepts: 'adjunctions', '2-category', 'equipments', 'characterization', 'geometric morphism'

- Text: The theory of enriched accessible categories over a suitable base category V is developed
- Concepts: 'enriched accessible categories', 'base category', 'enrichment', 'accessible categories'

- Text: It is proved that these enriched accessible categories coincide with the categories of flat functors, but also with the categories of models of enriched sketches
- Concepts: 'enriched accessible categories', 'categories of flat functors', 'models of enriched sketches'

- Text: A particular attention is devoted to enriched locally presentable categories and enriched functors.
- Concepts: 'enriched', 'locally presentable categories', 'enriched functors'

- Text: We show that the homotopy category of simplicial diagrams $I-SS$ indexed by a small category I is equivalent to a homotopy category of $SS\downarrow NI$ simplicial sets over the nerve NI

- Concepts: 'homotopy category', 'simplicial diagrams', 'small category', 'homotopy category of simplicial sets', 'nerve'

- Text: Then their equivalences, by means of the nerve functor N : Cat --> SS$ from the category Cat of small categories, with respective homotopy categories associated to Cat are established
- Concepts: equivalences', 'nerve functor', 'small categories', 'homotopy categories'

- Text: Consequently, an equivariant simplicial version of the Whitehead Theorem is derived.
- Concepts: 'equivariant', 'simplicial', 'Whitehead Theorem'

- Text: Using descent theory we give various forms of short five-lemma in protomodular categories, known in the case of exact protomodular categories
- Concepts: descent theory', 'short five-lemma', 'protomodular categories', 'exact protomodular categories'

- Text: We also describe the situation where the notion of a semidirect product can be defined categorically.
- Concepts: 'semidirect product', 'categorically'

- Text: In the literature there are several kinds of concrete and abstract cell complexes representing composition in n-categories, \omega-categories or \infty-categories, and the slightly more general partial \omega-categories

- Concepts: cell complex, composition, n-categories, \omega-categories, \infty-categories, partial \omega-categories

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- Text: Some examples are parity c omplexes, pasting schemes and directed complexes
- Concepts: parity complexes, pasting schemes, directed complexes

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- Text: In this paper we give an axiomatic treatment: that is to say, we study the class of `\omega-complexes' which consists of all complexes representing partial \omega-categories
- Concepts: 'axiomatic treatment', '\omega-complexes', 'complexes', 'partial \omega-categories'

- Text: We show that \omega-complexes can be given geometric structures and that in most important examples they become well-behaved CW complexes; we characterise \omega-complexes by conditions on their cells; we show that a product of \omega-complexes is again an \omega-complex; and we describe some products in detail.
- Concepts: \omega-complexes', 'geometric structures', 'CW complexes', 'cells', 'product'

- Text: If $\cal M$ is both an abelian category and a symmetric monoidal closed category, then it is natural to ask whether projective objects in $\cal M$ are flat, and whether the tensor product of two projective objects is projective

- Concepts: 'abelian category', 'symmetric monoidal closed category', 'projective objects', 'flat', 'tensor product'

- Text: In the most familiar such categories, the answer to these questions is obviously yes
- Concepts: categories'

- Text: However, the category $\cal M_G$ of Mackey functors for a compact Lie group G is a category of this type in which projective objects need not be so well-behaved
- Concepts: Mackey functors', 'compact Lie group', 'category', 'projective objects'

- Text: This category is of interest since good equivariant cohomology theories are Mackey functor valued
- Concepts: category', 'equivariant cohomology', 'Mackey functor'

- Text: The tensor product on $\cal M_G$ is important in this context because of the role it plays in the not yet fully understood universal coefficient and K\"{u}nneth formulae
- Concepts: 'tensor product', '$\cal M_G$', 'universal coefficient', 'K\"{u}nneth formulae'

- Text: This role makes the relationship between projective objects and the tensor product especially critical
- Concepts: projective objects', 'tensor product'

- Text: Unfortunately, if G is, for example, $O(n)$, then projectives need not be flat in $\cal M_G$ and the tensor product of projective objects need not be projective
- Concepts: projectives, flat, tensor product

- Text: This misbe haviorcomplicates the search for full strength equivariant universal coefficient and K\"{u}nneth formulae. The primary purpose of this article is to investigate these questions about the interaction of the tensor product with projective objects in symmetric monoidal abelian categories
- Concepts: 'universal coefficient', 'K\"{u}nneth formulae', 'tensor product', 'projective objects', 'symmetric monoidal abelian categories'

- Text: Our focus is on functor categories whose monoidal structures arise in a fashion described by Day
- Concepts: functor categories', 'monoidal structures', 'Day'

- Text: Conditions are given under which such a structure interacts appropriately with projective objects
- Concepts: 'structure', 'projective objects'

- Text: Further, examples are given to show that, when these conditions aren't met, this interaction can be quite bad
- Concepts: interaction

- Text: These examples were not fabricated to illustrate the abstract possibility of misbehavior

- Concepts: 'examples', 'fabricated', 'abstract possibility', 'misbehavior'

- Text: Rather, they are drawn from the literature
- Concepts: None - this context does not mention any specific math concepts.

- Text: In particular, $\cal M_G$ is badly behaved not only for the groups $O(n)$, but also for the groups $SO(n)$, $U(n)$, $SU(n)$, $Sp(n)$, and $ Spin(n)$
- Concepts: $\cal M_G$, groups, $O(n)$, $SO(n)$, $U(n)$, $SU(n)$, $Sp(n)$, $Spin(n)$

- Text: Similar misbehavior occurs in two categories of global Mackey functors which are widely used in the study of classifying spaces of finite groups
- Concepts: 'misbehavior', 'categories', 'global Mackey functors', 'study', 'classifying spaces', 'finite groups'

- Text: Given the extent of the homological misbehavior in Mackey functor categories described here, it is reasonable to expect that similar problems occur in other functor categories carrying symmetric monoidal closed structures provided by Day's machinery.
- Concepts: 'homological misbehavior', 'Mackey functor categories', 'functor categories', 'symmetric monoidal', 'closed structures', "Day's machinery"

- Text: We give an abstract characterization of categories which are localizations of Maltsev varieties
- Concepts: 'categories', 'localizations', 'Maltsev varieties'

- Text: These results can be applied to characterize localizations of naturally Maltsev varieties.
- Concepts: 'localizations', 'naturally Maltsev varieties'

- Text: Using the Chu-construction, we define a group algebra for topological Hausdorff groups
- Concepts: 'Chu-construction', 'group algebra', 'topological Hausdorff groups'

- Text: Furthermore, for isometric, weakly continuous representations of a subgroup H of a Hausdorff group G induced representations are constructed.
- Concepts: 'isometric', 'weakly continuous', 'representations', 'subgroup', 'Hausdorff group', 'induced representations'

- Text: Exponentiable spaces are characterized in terms of convergence
- Concepts: 'exponentiable spaces', 'convergence'

- Text: More precisely, we prove that a relation $R:{\cal U}X \rightharpoonup X$ between ultrafilters and elements of a set X is the convergence relation for a quasi-locally-compact (that is, exponentiable) topology on X if and only if the following conditions are satisfied: 1

- Concepts: 'ultrafilters', 'set', 'convergence relation', 'quasi-locally-compact topology', 'exponentiable topology'

- Text: $id \subseteq R\circ\eta $ 2.$R\circ {\cal U}R = R\circ\mu $ where $\eta : X \to {\cal U}X$ and $\mu : {\cal U}({\cal U}X) \to {\cal U}X$ are the unit and the multiplication of the ultrafilter monad, and ${\cal U} : \bi{Rel} \to \bi{Rel}$ extends the ultrafilter functor ${\cal U} : \bi{Set} \to \bi{Set}$ to the category of sets and relations
- Concepts: 'id', 'R', 'unit', 'multiplication', 'ultrafilter monad', 'ultrafilter functor', 'sets', 'relations'

- Text: $({\cal U},\eta,\mu)$ fails to be a monad on $\bi{Rel}$ only because η is not a strict natural transformation
- Concepts: monad, $\bi{Rel}$, strict natural transformation

- Text: So, exponentiable spaces are the lax (with respect to the unit law) algebras for a lax monad on $\bi{Rel}$
- Concepts: 'exponentiable spaces', 'lax', 'algebras', 'lax monad', '$\bi{Rel}$'

- Text: Strict algebras are exponentiable and T_1 spaces.
- Concepts: 'Strict algebras', 'exponentiable', 'T_1 spaces'

- Text: We define distributive laws between pseudomonads in a Gray-category A, as the classical two triangles and the two pentagons but commuting only up to isomorphism

- Concepts: 'distributive laws', 'pseudomonads', 'Gray-category', 'two triangles', 'two pentagons', 'commuting', 'isomorphism'

- Text: These isomorphisms must satisfy nine coherence conditions
- Concepts: isomorphisms, coherence conditions

- Text: We also define the \gray-category PSM(A) of pseudomonads in A, and define a lifting to be a pseudomonad in PSM(A)
- Concepts: 'pseudomonads', 'lifting'

- Text: We define what is a pseudomonad with compatible structure with respect to two given pseudomonads
- Concepts: 'pseudomonad', 'compatible structure'

- Text: We show how to obtain a pseudomonad with compatible structure from a distributive law, how to get a lifting from a pseudomonad with compatible structure, and how to obtain a distributive law from a lifting
- Concepts: 'pseudomonad', 'compatible structure', 'distributive law', 'lifting'

- Text: We show that one triangle suffices to define a distributive law in case that one of the pseudomonads is a (co-)KZ-doctrine and the other a KZ-doctrine.
- Concepts: 'triangle', 'distributive law', 'pseudomonads', 'co-KZ-doctrine', 'KZ-doctrine'

- Text: The main result is that two possible structures which may be imposed on an edge symmetric double category, namely a connection pair and a thin structure, are equivalent
- Concepts: 'edge symmetric double category', 'connection pair', 'thin structure', 'equivalent'

- Text: A full proof is also given of the theorem of Spencer, that the category of small 2-categories is equivalent to the category of edge symmetric double categories with thin structure.
- Concepts: 2-categories', 'category', 'edge symmetric double categories', 'thin structure', 'equivalent', 'theorem'

- Text: All the useful categories in the study of the mixed abelian groups (e.g
- Concepts: 'mixed abelian groups', 'categories'

- Text: {\bf Warf} and {\bf Walk}) ignore the torsion
- Concepts: 'torsion'

- Text: We introduce a new category denoted ${\cal A}$ which ignores the torsion-freeness and could characterize some classes of nonsplitting mixed groups with the aid of {\bf Walk.}
- Concepts: 'category', '${\cal A}$', 'torsion-freeness', 'mixed groups', 'Walk'

- Text: A new description of the exact completion $\cal C_{ex/reg}$ of a regular category $\cal C$ is given, using a certain topos $Shv(\cal C)$ of sheaves on $\cal C$; the exact completion is then constructed as the closure of $\cal C$ in $Shv(\cal C)$ under finite limits and coequalizers of equivalence relations

- Concepts: 'regular category', 'exact completion', 'topos', 'sheaves', 'closure', 'finite limits', 'coequalizers', 'equivalence relations'

- Text: An infinitary generalization is proved, and the classical description of the exact completion is derived.
- Concepts: 'infinitary generalization', 'classical description', 'exact completion'

- Text: The class of functors known as discrete Conduché fibrations forms a common generalization of discrete fibrations and discrete opfibrations, and shares many of the formal properties of these two classes
- Concepts: 'discrete fibrations', 'discrete opfibrations', 'Conduché fibrations', 'formal properties'

- Text: F
- Concepts: None

- Text: Lamarche conjectured that, for any small category $\cal B$, the category ${\bf DCF}/{\cal B}$ of discrete Conduché fibrations over $\cal B$ should be a topos
- Concepts: small category, discrete Conduché fibration, topos

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- Text: In this note we show that, although for suitable categories $\cal B$ the discrete Conduch&eacute fibrations over $\cal B$ may be presented as the `sheaves' for a family of coverings on a category ${\cal B}_{tw}$ constructed from $\cal B$, they are in general very far from forming a topos.
- Concepts: Conduché fibrations, discrete Conduché fibrations, sheaves, coverings, topos

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- Text: In this paper I extend Gray's tensor product of 2-categories to a new tensor product of Gray-categories
- Concepts: tensor product', '2-categories', 'Gray-categories'

- Text: I give a description in terms of generators and relations, one of the relations being an ``interchange'' relation, and a description similar to Gray's description of his tensor product of 2-categories
- Concepts: generators, relations, interchange relation, Gray's tensor product, 2-categories

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- Text: I show that this tensor product of Gray-categories satisfies a universal property with respect to quasi-functors of two variables, which are defined in terms of lax-natural transformations between Gray-categories
- Concepts: 'tensor product', 'Gray-categories', 'universal property', 'quasi-functors', 'variables', 'lax-natural transformations'

- Text: The main result is that this tensor product is part of a monoidal structure on Gray-Cat, the proof requiring interchange in an essential way

- Concepts: 'tensor product', 'monoidal structure', 'Gray-Cat', 'proof', 'interchange'

- Text: However, this does not give a monoidal {(bi)closed} structure, precisely because of interchange
- Concepts: monoidal, closed, interchange

- Text: And although I define composition of lax-natural transformations, this composite need not be a lax-natural transformation again, making Gray-Cat only a partial Gray-Cat$_\otimes$-CATegory.
- Concepts: 'lax-natural transformations', 'composition', 'Gray-Cat', 'partial Gray-Cat$_\otimes$-CATegory'

- Text: In this paper certain proof-theoretic techniques of [BCST] are applied to non-symmetric linearly distributive categories, corresponding to non-commutative negation-free multiplicative linear logic (mLL)
- Concepts: linearly distributive categories, non-symmetric linearly distributive categories, multiplicative linear logic, proof-theoretic techniques

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- Text: First, the correctness criterion for the two-sided proof nets developed in [BCST] is adjusted to work in the non-commutative setting
- Concepts: 'correctness criterion', 'two-sided proof nets', 'non-commutative setting'

- Text: Second, these proof nets are used to represent morphisms in a (non-symmetric) linearly distributive category; a notion of proof-net equivalence is developed which permits a considerable sharpening of the previous coherence results concerning these categories, including a decision procedure for the equality of maps when there is a certain restriction on the units
- Concepts: 'proof nets', 'morphisms', 'linearly distributive category', 'proof-net equivalence', 'coherence results', 'decision procedure', 'equality of maps', 'units'

- Text: In particular a decision procedure is obtained for the equivalence of proofs in non-commutative negation-free mLL without non-logical axioms.
- Concepts: decision procedure, equivalence of proofs, non-commutative, mLL, negation-free, non-logical axioms

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- Text: We characterize when the coequalizer and the exact completion of a category $\cal C$ with finite sums and weak finite limits coincide.
- Concepts: coequalizer, exact completion, category, finite sums, weak finite limits

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- Text: A von Neumann regular extension of a semiprime ring naturally defines a epimorphic extension in the category of rings
- Concepts: 'von Neumann regular', 'semiprime ring', 'epimorphic extension', 'category of rings'

- Text: These are studied, and four natural examples are considered, two in commutative ring theory, and two in rings of continuous functions.
- Concepts: 'commutative ring theory', 'rings of continuous functions'

- Text: We define the notion of enriched Lawvere theory, for enrichment over a monoidal biclosed category V that is locally finitely presentable as a closed category
- Concepts: 'enriched Lawvere theory', 'monoidal biclosed category', 'locally finitely presentable', 'closed category'

- Text: We prove that the category of enriched Lawvere theories is equivalent to the category of finitary monads on V
- Concepts: 'enriched Lawvere theories', 'finitary monads', 'V'

- Text: Moreover, the V-category of models of a Lawvere V-theory is equivalent to the V-category of algebras for the corresponding V-monad
- Concepts: 'Lawvere V-theory', 'V-category', 'models', 'algebras', 'V-monad'

- Text: This all extends routinely to local presentability with respect to any regular cardinal
- Concepts: 'local presentability', 'regular cardinal'

- Text: We finally consider the special case where V is Cat, and explain how the correspondence extends to pseudo maps of algebras.

- Concepts: 'Cat', 'pseudo maps', 'algebras'

- Text: We characterize the numerical functions which arise as the cardinalities of contravariant functors on finite sets, as those which have a series expansion in terms of Stirling functions
- Concepts: 'numerical functions', 'contravariant functors', 'finite sets', 'series expansion', 'Stirling functions'

- Text: We give a procedure for calculating the coefficients in such series and a concrete test for determining whether a function is of this type
- Concepts: 'coefficients', 'series', 'function'

- Text: A number of examples are considered.
- Concepts: 'number', 'examples' (no math concepts are present in this context)

- Text: Uniqueness for higher type term constructors in lambda calculi (e.g
- Concepts: 'uniqueness', 'higher type term constructors', 'lambda calculi'

- Text: surjective pairing for product types, or uniqueness of iterators on the natural numbers) is easily expressed using universally quantified conditional equations
- Concepts: 'surjective pairing', 'product types', 'uniqueness', 'iterators', 'natural numbers', 'universally quantified', 'conditional

equations'

- Text: We use a technique of Lambek [18] involving Mal'cev operators to equationally express uniqueness of iteration (more generally, higher-order primitive recursion) in a simply typed lambda calculus, essentially Godel's T [29,13]
- Concepts: Lambek, Mal'cev operators, equationally express, uniqueness, iteration, higher-order, primitive recursion, simply typed lambda calculus, Godel's T

- Text: We prove the following facts about typed lambda calculus with uniqueness for primitive recursors: (i) It is undecidable, (ii) Church-Rosser fails, although ground Church-Rosser holds, (iii) strong normalization (termination) is still valid
- Concepts: 'typed lambda calculus', 'uniqueness', 'primitive recursors', 'undecidable', 'Church-Rosser', 'ground Church-Rosser', 'strong normalization', 'termination'

- Text: This entails the undecidability of the coherence problem for cartesian closed categories with strong natural numbers objects, as well as providing a natural example of the following computational paradigm: a non-CR, ground CR, undecidable, terminating rewriting system.
- Concepts: 'undecidability', 'coherence problem', 'cartesian closed categories', 'strong natural numbers objects', 'computational paradigm', 'non-CR', 'ground CR', 'terminating rewriting system'

- Text: We demonstrate how the identity $N\otimes N \cong N$ in a monoidal category allows us to construct a functor from the full subcategory generated by N and $\otimes$ to the endomorphism monoid of the object N
- Concepts: 'identity', 'monoidal category', 'functor', 'subcategory', 'endomorphism monoid'

- Text: This provides a categorical foundation for one-object analogues of the symmetric monoidal categories used by J.-Y
- Concepts: 'categorical foundation', 'one-object analogues', 'symmetric monoidal categories'

- Text: Girard in his Geometry of Interaction series of papers, and explicitly described in terms of inverse semigroup theory in [6,11]. This functor also allows the construction of one-object analogues of other categorical structures
- Concepts: 'Geometry of Interaction', 'inverse semigroup theory', 'functor', 'categorical structures'

- Text: We give the example of one-object analogues of the categorical trace, and compact closedness
- Concepts: 'one-object', 'categorical trace', 'analogues', 'compact closedness'

- Text: Finally, we demonstrate how the categorical theory of self-similarity can be related to the algebraic theory (as presented in [11]), and Girard's dynamical algebra, by considering one-object analogues of projections and inclusions.

- Concepts: 'categorical theory', 'self-similarity', 'algebraic theory', 'dynamical algebra', 'one-object analogues', 'projections', 'inclusions'

- Text: This represents a new and more comprehensive approach to the \star-autonomous categories constructed in the monograph [Barr, 1979]
- Concepts: 'star-autonomous categories', 'monograph'

- Text: The main tool in the new approach is the Chu construction
- Concepts: 'Chu construction'

- Text: The main conclusion is that the category of separated extensional Chu objects for certain kinds of equational categories is equivalent to two usually distinct subcategories of the categories of uniform algebras of those categories.
- Concepts: category, equational categories, Chu objects, separated extensional Chu objects, uniform algebras, subcategories

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- Text: The contravariant powerset, and its generalisations Σ^X to the lattices of open subsets of a locally compact topological space and of recursively enumerable subsets of numbers, satisfy the Euclidean principle that $\phi\meet F(\phi)=\phi\meet F(\top)$. Conversely, when the adjunction $\Sigma^{(-)}\dashv\Sigma^{(-)}$ is monadic, this equation implies that Σ classifies some class of monos, and the Frobenius law $\exists x.(\phi(x)\meet\psi)=(\exists x.\phi(x))\meet\psi)$ for the existential quantifier. In topology, the lattice duals of these equations also hold, and are related to the Phoa principle in synthetic domain theory. The natural definitions of discrete and Hausdorff spaces correspond to equality and inequality, whilst the quantifiers considered as adjoints characterise open (or, as we call them, overt) and compact spaces

- Concepts: 'contravariant powerset', 'lattices of open subsets', 'locally compact topological space', 'recursively enumerable subsets', 'Euclidean principle', 'adjunction', 'monadic', 'classifies', 'monos', 'Frobenius law', 'existential quantifier', 'topology', 'lattice duals', 'Phoa principle', 'synthetic domain theory', 'discrete spaces', 'Hausdorff spaces', 'quantifiers', 'adjoints', 'open spaces', 'compact spaces'

- Text: Our treatment of overt discrete spaces and open maps is precisely dual to that of compact Hausdorff spaces and proper maps. The category of overt discrete spaces forms a pretopos and the paper concludes with a converse of Paré's theorem (that the contravariant powerset functor is monadic) that characterises elementary toposes by means of the monadic and Euclidean properties together with all quantifiers, making no reference to subsets.
- Concepts: 'discrete spaces', 'open maps', 'compact Hausdorff spaces', 'proper maps', 'pretopos', 'contravariant powerset functor', 'monadic', 'elementary toposes', 'Euclidean properties', 'quantifiers', 'subsets'

- Text: In this paper we use Quillen's model structure given by Dwyer-Kan for the category of simplicial groupoids (with discrete object of objects) to describe in this category, in the simplicial language, the fundamental homotopy theoretical constructions of path and cylinder objects
- Concepts: 'Quillen model structure', 'Dwyer-Kan', 'simplicial groupoids', 'discrete object', 'fundamental homotopy', 'path object', 'cylinder object'

- Text: We then characterize the associated left and right homotopy relations in terms of simplicial identities and give a simplicial description of the homotopy category of simplicial groupoids
- Concepts: 'left homotopy relation', 'right homotopy relation', 'simplicial identities', 'simplicial description', 'homotopy category', 'simplicial groupoids'

- Text: Finally, we show loop and suspension functors in the pointed case.
- Concepts: 'loop functor', 'suspension functor', 'pointed case'

- Text: The purpose of this paper is to indicate some bicategorical properties of ring theory
- Concepts: 'paper', 'bicategorical properties', 'ring theory'

- Text: In this interaction, static modules are analyzed.
- Concepts: 'static modules', 'analyzed'

- Text: This paper defines a solution manifold and a stable submanifold for a system of differential equations
- Concepts: 'solution manifold', 'stable submanifold', 'system', 'differential equations'

- Text: Although we eventually work in the smooth topos, the first two sections do not mention topos theory and should be of interest to non-topos theorists
- Concepts: 'smooth topos', 'topos theory'

- Text: The paper characterizes solutions in terms of barriers to growth and defines solutions in what are called filter rings (characterized as C^{∞}-reduced rings in a paper of Moerdijk and Reyes)
- Concepts: 'filter rings', 'C^{∞}-reduced rings', 'solutions', 'barriers to growth'

- Text: We examine standardization, stabilization, perturbation, change of variables, non-standard solutions, strange attractors and cycles at infinity.
- Concepts: 'standardization', 'stabilization', 'perturbation', 'change of variables', 'non-standard solutions', 'strange attractors', 'cycles at infinity'

- Text: In analogy with the varietal case, we give an abstract characterization of those categories occurring as regular epireflective subcategories of presheaf categories such that the inclusion functor preserves small sums.

- Concepts: 'varietal', 'categories', 'regular epireflective subcategories', 'presheaf categories', 'inclusion functor', 'small sums'

- Text: We investigate preserving of projectivity and injectivity by the object-wise tensor product of $R\Bbb{C}$-modules, where $\Bbb{C}$ is a small category
- Concepts: 'projectivity', 'injectivity', 'tensor product', '$R\Bbb{C}$-modules', 'small category'

- Text: In particular, let ${\cal O}(G,X)$ be the category of canonical orbits of a discrete group G, over a G-set X
- Concepts: 'category', 'canonical orbits', 'discrete group', 'G-set'

- Text: We show that projectivity of $R{\cal O}(G,X)$-modules is preserved by this tensor product
- Concepts: projectivity, tensor product, $R{\cal O}(G,X)$-modules

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- Text: Moreover, if G is a finite group, X a finite G-set and R is an integral domain then such a tensor product of two injective $R{\cal O}(G,X)$-modules is again injective.
- Concepts: finite group, finite G-set, integral domain, tensor product, injective module

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- Text: We show that every algebraically-central extension in a Mal'tsev variety - that is, every surjective homomorphism $f : A \longrightarrow B$ whose kernel-congruence is contained in the centre of A, as defined using the theory of commutators - is also a central extension in the sense of categorical Galois theory; this was previously known only for varieties of Ω-groups, while its converse is easily seen to hold for any congruence-modular variety.

- Concepts: Mal'tsev variety, surjective homomorphism, kernel-congruence, centre of A, commutators, central extension, categorical Galois theory, Ω-groups, congruence-modular variety

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- Text: The notion of normal subobject having an intrinsic meaning in any protomodular category, we introduce the notion of normal functor, namely left exact conservative functor which reflects normal subobjects
- Concepts: 'protomodular category', 'normal subobject', 'intrinsic meaning', 'normal functor', 'left exact', 'conservative functor'

- Text: The point is that for the category {\bf Gp} of groups the change of base functors, with respect to the fibration of pointed objects, are not only conservative (this is the definition of a protomodular category), but also normal
- Concepts: 'category', 'groups', 'change of base functors', 'fibration', 'pointed objects', 'conservative', 'protomodular category', 'normal'

- Text: This leads to the notion of strongly protomodular category
- Concepts: 'strongly protomodular category'

- Text: Some of their properties are given, the main one being that this notion is inherited by the slice categories.
- Concepts: 'slice categories', 'notion'

- Text: For a set ${\cal M}$ of graphs the category ${\bf Cat}_{\cal M}$ of all ${\cal M}$-complete categories and all strictly ${\cal M}$-continuous functors is known to be monadic over ${\bf Cat}$
- Concepts: 'category', 'complete categories', 'continuous functors', 'monadic', 'graphs'

- Text: The question of monadicity of ${\bf Cat}_{\cal M}$ over the category of graphs is known to have an affirmative answer when ${\cal M}$ specifies either (i) all finite limits, or (ii) all finite products, or (iii) equalizers and terminal objects, or (iv) just terminal objects
- Concepts: monadicity, category, graphs, finite limits, finite products, equalizers, terminal objects

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- Text: We prove that, conversely, these four cases are (essentially) the only cases of monadicity of $\Cat_\M$ over the category of graphs, provided that ${\cal M}$ is a set of finite graphs containing the empty graph.
- Concepts: monadicity, category, graphs, finite graphs, empty graph

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- Text: There is a 2-category {\cal J}{\bf-Colim} of small categories equipped with a choice of colimit for each diagram whose domain J lies in a given small class {\cal J} of small categories, functors strictly preserving such colimits, and natural transformations

- Concepts: 2-category', 'small categories', 'colimit', 'diagram', 'domain', 'functors', 'natural transformations', 'small class'

- Text: The evident forgetful 2-functor from {\cal J}{\bf-Colim} to the 2-category {\bf Cat} of small categories is known to be monadic
- Concepts: '2-functor', 'cal J', 'colim', '2-category', 'small categories', 'monadic'

- Text: We extend this result by considering not just conical colimits, but general weighted colimits; not just ordinary categories but enriched ones; and not just small classes of colimits but large ones; in this last case we are forced to move from the 2-category {\cal V}{\bf-Cat} of small {\cal V}-categories to {\cal V}-categories with object-set in some larger universe
- Concepts: weighted colimits, enriched categories, 2-category, small categories, large categories, universe

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- Text: In each case, the functors preserving the colimits in the usual ``up-to-isomorphism'' sense are recovered as the {\em pseudomorphisms} between algebras for the 2-monad in question.
- Concepts: 'functors', 'colimits', 'pseudomorphisms', 'algebras', '2-monad'

- Text: A balanced coalgebroid is a ${\cal V}^{op}$-category with extra structure ensuring that its category of representations is a balanced monoidal category

- Concepts: 'balanced coalgebroid', '${\cal V}^{op}$-category', 'category of representations', 'balanced monoidal category'

- Text: We show, in a sense to be made precise, that a balanced structure on a coalgebroid may be reconstructed from the corresponding structure on its category of representations
- Concepts: 'coalgebroid', 'category of representations', 'balanced structure'

- Text: This includes the reconstruction of dual quasi-bialgebras, quasi-triangular dual quasi-bialgebras, and balanced quasi-triangular dual quasi-bialgebras; the latter of which is a quantum group when equipped with a compatible antipode
- Concepts: dual quasi-bialgebras, quasi-triangular dual quasi-bialgebras, balanced quasi-triangular dual quasi-bialgebras, quantum group, antipode

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- Text: As an application we construct a balanced coalgebroid whose category of representations is equivalent to the symmetric monoidal category of chain complexes
- Concepts: 'balanced coalgebroid', 'category of representations', 'symmetric monoidal category', 'chain complexes'

- Text: The appendix provides the definitions of a braided monoidal bicategory and sylleptic monoidal bicategory.
- Concepts: 'braided monoidal bicategory', 'sylleptic monoidal bicategory'

- Text: This paper is a first step in the study of symmetric cat-groups as the 2-dimensional analogue of abelian groups
- Concepts: 'symmetric cat-groups', '2-dimensional', 'analogue', 'abelian groups'

- Text: We show that a morphism of symmetric cat-groups can be factorized as an essentially surjective functor followed by a full and faithful one, as well as a full and essentially surjective functor followed by a faithful one
- Concepts: 'morphism', 'symmetric cat-groups', 'factorized', 'essentially surjective', 'functor', 'full and faithful', 'full and essentially surjective', 'faithful'

- Text: Both these factorizations give rise to a factorization system, in a suitable 2-categorical sense, in the 2-category of symmetric cat-groups
- Concepts: 'factorization system', '2-categorical sense', '2-category', 'symmetric cat-groups'

- Text: An application to exact sequences is given.
- Concepts: 'exact sequences'

- Text: The term ``saturated,'' referring to a class of morphisms in a category, is used in the literature for two nonequivalent concepts
- Concepts: 'saturated', 'class of morphisms', 'category', 'nonequivalent concepts'

- Text: We make precise the relationship between these two concepts and show that the class of equivalences associated with any monad is saturated in both senses.
- Concepts: monad, class of equivalences, saturated

- Text: The purpose of this paper is to give a new proof of the Joyal-Tierney theorem (unpublished), which asserts that a morphism $f:R\rightarrow S$ of commutative rings is an effective descent morphism for modules if and only if f is pure as a morphism of R-modules.
- Concepts: 'proof', 'Joyal-Tierney theorem', 'morphism', 'commutative rings', 'effective descent morphism', 'modules', 'pure', 'R-modules'

- Text: It is well-known that, given a Dedekind category {\cal R} the category of (typed) matrices with coefficients from {\cal R} is a Dedekind category with arbitrary relational sums
- Concepts: 'Dedekind category', 'matrices', 'coefficients', 'relational sums'

- Text: In this paper we show that under slightly stronger assumptions the converse is also true
- Concepts: none - there are no Math concepts mentioned in this context

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- Text: Every atomic Dedekind category {\cal R} with relational sums and subobjects is equivalent to a category of matrices over a suitable basis

- Concepts: 'atomic Dedekind category', 'relational sums', 'subobjects', 'category of matrices', 'suitable basis'

- Text: This basis is the full proper subcategory induced by the integral objects of {\cal R}
- Concepts: 'basis', 'subcategory', 'integral objects'

- Text: Furthermore, we use our concept of a basis to extend a known result from the theory of heterogeneous relation algebras.
- Concepts: 'basis', 'theory', 'relation algebras'

- Text: We show, for a monoidal closed category $V = (V_0,\otimes,I)$, that the category V-Cat of small V-categories is locally λ-presentable if V_0 is so, and that it is locally λ-bounded if the closed category V is so, meaning that V_0 is locally λ-bounded and that a side condition involving the monoidal structure is satisfied.
- Concepts: 'monoidal closed category', 'V-categories', 'locally λ-presentable', 'V_0', 'locally λ-bounded', 'closed category', 'monoidal structure'

- Text: We present some new findings concerning branched covers in topos theory
- Concepts: 'branched covers', 'topos theory'

- Text: Our discussion involves a particular subtopos of a given topos that can be described as the smallest subtopos closed under small coproducts in the including topos

- Concepts: 'subtopos', 'given topos', 'smallest subtopos', 'closed under small coproducts'

- Text: Our main result is a description of the covers of this subtopos as a category of fractions of branched covers, in the sense of Fox, of the including topos
- Concepts: 'subtopos', 'category of fractions', 'branched covers', 'including topos'

- Text: We also have some new results concerning the general theory of KZ-doctrines, such as the closure under composition of discrete fibrations for a KZ-doctrine, in the sense of Bunge and Funk.
- Concepts: 'KZ-doctrines', 'general theory', 'closure under composition', 'discrete fibrations'

- Text: A category with finite products and finite coproducts is said to be distributive if the canonical map $A \times B + A \times C \to A \times (B + C)$ is invertible for all objects A, B, and C
- Concepts: 'category', 'finite products', 'finite coproducts', 'distributive', 'canonical map', 'invertible', 'objects'

- Text: Given a distributive category $\cal D$, we describe a universal functor $\cal D \to \cal D_{ex}$ preserving finite products and finite coproducts, for which $\cal D_{ex}$ is extensive; that is, for all objects A and B the functor $\cal D_{ex}/A \times \cal D_{ex}/B \to \cal D_{ex}/(A + B)$ is an equivalence of categories. As an application, we show that a distributive category $\cal D$ has a full distributive embedding into the product of an extensive category with products and a distributive preorder.

- Concepts: 'distributive category', 'functor', 'finite products', 'finite coproducts', 'extensive', 'objects', 'equivalence of categories', 'full distributive embedding', 'preorder'

- Text: In analogy with the relation between closure operators in presheaf toposes and Grothendieck topologies, we identify the structure in a category with finite limits that corresponds to universal closure operators in its regular and exact completions
- Concepts: 'presheaf topos', 'Grothendieck topology', 'category with finite limits', 'universal closure operators', 'regular completion', 'exact completion'

- Text: The study of separated objects in exact completions will then allow us to give conceptual proofs of local cartesian closure of different categories of pseudo equivalence relations
- Concepts: 'separated objects', 'exact completions', 'conceptual proofs', 'local cartesian closure', 'categories', 'pseudo equivalence relations'

- Text: Finally, we characterize when certain categories of sheaves are toposes.
- Concepts: 'categories', 'sheaves', 'toposes'

- Text: We show that lax epimorphisms in the category Cat are precisely the functors $P : {\cal E} \to {\cal B}$ for which the functor $P^{*}: [{\cal B}, Set] \to [{\cal E}, Set]$ of composition with P is fully faithful

- Concepts: 'lax epimorphisms', 'category', 'functors', 'composition', 'fully faithful'

- Text: We present two other characterizations
- Concepts: 'characterizations'

- Text: Firstly, lax epimorphisms are precisely the ``absolutely dense'' functors, i.e., functors P such that every object B of ${\cal B}$ is an absolute colimit of all arrows $P(E)\to B$ for E in ${\cal E}$
- Concepts: 'lax epimorphisms', 'functors', 'absolute colimit', 'arrows'

- Text: Secondly, lax epimorphisms are precisely the functors P such that for every morphism f of ${\cal B}$ the category of all factorizations through objects of $P[{\cal E}]$ is connected. A relationship between pseudoepimorphisms and lax epimorphisms is discussed.
- Concepts: 'lax epimorphisms', 'functors', 'category', 'factorizations', 'objects'

- Text: The context of enriched sheaf theory introduced in the author's thesis provides a convenient viewpoint for models of the stable homotopy category as well as categories of finite loop spaces

- Concepts: 'enriched sheaf theory', 'stable homotopy category', 'categories of finite loop spaces'

- Text: Also, the languages of algebraic geometry and algebraic topology have been interacting quite heavily in recent years, primarily due to the work of Voevodsky and that of Hopkins
- Concepts: 'algebraic geometry', 'algebraic topology', 'Voevodsky', 'Hopkins'

- Text: Thus, the language of Grothendieck topologies is becoming a necessary tool for the algebraic topologist
- Concepts: 'Grothendieck topologies', 'algebraic topologist'

- Text: The current article is intended to give a somewhat relaxed introduction to this language of sheaves in a topological context, using familiar examples such as n-fold loop spaces and pointed G-spaces
- Concepts: 'sheaves', 'topological context', 'n-fold loop spaces', 'pointed G-spaces'

- Text: This language also includes the diagram categories of spectra as well as spectra in the sense of Lewis, which will be discussed in some detail.
- Concepts: diagram categories, spectra, Lewis

- Text: A cartesian closed topological hull of the construct CLS of closure spaces and continuous maps is constructed

- Concepts: 'cartesian closed', 'topological', 'construct', 'closure spaces', 'continuous maps'

- Text: The construction is performed in two steps
- Concepts: 'construction', 'two steps'

- Text: First a cartesian closed extension L of CLS is obtained
- Concepts: 'cartesian closed extension', 'CLS'

- Text: We apply a method worked out by J
- Concepts: method'

- Text: Adamek and J
- Concepts: There are no Math concepts mentioned in this context.

- Text: Reiterman for constructing extensions of constructs that in some sense ``resemble'' the construct of uniform spaces
- Concepts: 'extensions', 'constructs', 'uniform spaces'

- Text: Secondly, within this extension L the cartesian closed topological hull L* of CLS is characterized as a full subconstruct
- Concepts: 'extension', 'cartesian closed', 'topological hull', 'CLS', 'full subconstruct'

- Text: In order to find the internal characterization of the objects of L* we produce a concrete functor to the category of power closed collections based on CLS as introduced by J

- Concepts: 'internal characterization', 'objects', 'functor', 'category', 'power closed collections', 'CLS', 'J'

- Text: Adamek, J
- Concepts: Sorry, the context provided for this problem is incomplete. Please provide a complete context for us to identify the Math concepts.

- Text: Reiterman and G.E
- Concepts: None - the provided context does not contain any math concepts.

- Text: Strecker.
- Concepts: None, as there are no math concepts mentioned in the given context

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- Text: We prove the universal property of the infinitary exact completion of a category with weak small limits
- Concepts: 'infinitary exact completion', 'category', 'weak small limits', 'universal property'

- Text: As an application, we slightly weaken the conditions characterizing essential localizations of varieties (in particular, of module categories) and of presheaf categories.
- Concepts: 'essential localization', 'varieties', 'module categories', 'presheaf categories'

- Text: A categorical proof of the statement given by the title is provided, in generalization of a result for topological spaces proved recently by Clementino, Hofmann and Tholen.
- Concepts: 'categorical proof', 'generalization', 'result', 'topological spaces'

- Text: In the context of Mal'cev categories, a left exact root for the congruence distributive property is given and investigated, namely the property that there is no non trivial internal group inside the fibres of the fibration of pointed objects
- Concepts: 'Mal'cev categories', 'left exact root', 'congruence distributive property', 'internal group', 'fibres', 'fibration', 'pointed objects'

- Text: Indeed, when moreover the basic category $\mathbb{C}$ is Barr exact, the two previous properties are shown to be equivalent.
- Concepts: 'Barr exact', 'equivalent', 'basic category'

- Text: For a broad collection of categories $\cal K$, including all presheaf categories, the following statement is proved to be consistent: every left exact (i.e
- Concepts: 'categories', 'presheaf categories', 'left exact'

- Text: finite-limits preserving) functor from $\cal K$ to $\Set$ is small, that is, a small colimit of representables
- Concepts: 'finite-limits', 'preserving', 'functor', 'category', 'Set', 'small', 'colimit', 'representables'

- Text: In contrast, for the (presheaf) category ${\cal K}=\Alg(1,1)$ of unary algebras we construct a functor from $\Alg(1,1)$ to $\Set$ which preserves finite products and is not small
- Concepts: category, presheaf category, unary algebras, functor, $\Alg(1,1)$, $\Set$, finite products, not small

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- Text: We also describe all left exact set-valued functors as directed unions of ``reduced representables'', generalizing reduced products.
- Concepts: left exact, set-valued functors, directed unions, representables, reduced representables, reduced products

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- Text: We develop a new approach to Commutator theory based on the theory of internal categorical structures, especially of so called pseudogroupoids
- Concepts: 'Commutator theory', 'internal categorical structures', 'pseudogroupoids'

- Text: It is motivated by our previous work on internal categories and groupoids in congruence modular varieties.
- Concepts: 'internal categories', 'groupoids', 'congruence modular varieties'

- Text: We explore the combinatorial properties of the branching areas of execution paths in higher dimensional automata
- Concepts: 'combinatorial properties', 'branching areas', 'execution paths', 'higher dimensional automata'

- Text: Mathematically, this means that we investigate the combinatorics of the negative corner (or branching) homology of a globular ω-category and the combinatorics of a new homology theory called the reduced branching homology
- Concepts: combinatorics, negative corner, branching, homology, globular ω-category, reduced branching homology

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- Text: The latter is the homology of the quotient of the branching complex by the sub-complex generated by its thin elements
- Concepts: 'homology', 'quotient', 'branching complex', 'sub-complex', 'thin elements'

- Text: Conjecturally it coincides with the non reduced theory for higher dimensional automata, that is ω-categories freely generated by precubical sets
- Concepts: 'non reduced theory', 'higher dimensional automata', 'ω-categories', 'freely generated', 'precubical sets'

- Text: As application, we calculate the branching homology of some ω-categories and we give some invariance results for the reduced branching homology
- Concepts: branching homology', 'ω-categories', 'invariance', 'reduced branching homology'

- Text: We only treat the branching side
- Concepts: 'branching'

- Text: The merging side, that is the case of merging areas of execution paths is similar and can be easily deduced from the branching side.
- Concepts: 'merging', 'execution paths', 'branching'

- Text: We give an abstract characterization of the categories of models of sketches all of whose distinguished cones are based on connected (resp
- Concepts: 'categories', 'models', 'sketches', 'distinguished cones', 'connected'

- Text: non empty) categories. Nous donnons une caractérisation abstraite des catégories de modèles des esquisses dont tous les cônes projectifs distingués sont d'indexation connexe (resp
- Concepts: 'catégories', 'modèles', 'esquisses', 'cônes', 'projectifs', 'indexation', 'connexe'

- Text: non vide).
- Concepts: None - the given context is incomplete and does not contain any math-related words.

- Text: The 2-category VAR of finitary varieties is not varietal over CAT
- Concepts: 2-category, finitary varieties, varietal, CAT

- Text: We introduce the concept of an algebraically exact category and prove that the 2-category ALG of all algebraically exact categories is an equational hull of VAR w.r.t

- Concepts: 'algebraically exact category', '2-category', 'equational hull', 'VAR'

- Text: all operations with rank
- Concepts: 'operations', 'rank'

- Text: Every algebraically exact category $\cal K$ is complete, exact, and has filtered colimits which (a) commute with finite limits and (b) distribute over products; besides (c) regular epimorphisms in $\cal K$ are product-stable
- Concepts: algebraically exact category, complete category, exact category, filtered colimits, finite limits, products, regular epimorphisms, product-stable

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- Text: It is not known whether (a) - (c) characterize algebraic exactness
- Concepts: algebraic exactness

- Text: An equational hull of VAR w.r.t
- Concepts: 'equational hull'

- Text: all operations is also discussed.
- Concepts: 'operations'

- Text: Let $\cal C$ be a full subcategory of the category of topological abelian groups and SP$\cal C$ denote the full subcategory of subobjects of products of objects of $\cal C$

- Concepts: 'category', 'subcategory', 'topological', 'abelian groups', 'products', 'subobjects'

- Text: We say that SP$\cal C$ has Mackey coreflections if there is a functor that assigns to each object A of SP$\cal C$ an object τA that has the same group of characters as A and is the finest topology with that property
- Concepts: 'Mackey coreflections', 'functor', 'object', 'group of characters', 'topology'

- Text: We show that the existence of Mackey coreflections in SP$\cal C$ is equivalent to the injectivity of the circle with respect to topological subgroups of groups in $\cal C$.
- Concepts: 'Mackey coreflections', 'SP$\cal C$', 'injectivity', 'circle', 'topological subgroups', 'groups in $\cal C$'

- Text: The category of finite cardinals (or, equivalently, of finite sets) is the symmetric analogue of the category of finite ordinals, and the ground category of a relevant category of presheaves, the augmented symmetric simplicial sets
- Concepts: 'category', 'finite cardinals', 'symmetric analogue', 'finite ordinals', 'presheaves', 'augmented symmetric simplicial sets'

- Text: We prove here that this ground category has characterisations similar to the classical ones for the category of finite ordinals, by the existence of a universal symmetric monoid, or by generators and relations

- Concepts: 'ground category', 'classical ones', 'category', 'finite ordinals', 'universal symmetric monoid', 'generators', 'relations'

- Text: The latter provides a definition of symmetric simplicial sets by faces, degeneracies and transpositions, under suitable relations.
- Concepts: 'symmetric simplicial sets', 'faces', 'degeneracies', 'transpositions', 'suitable relations'

- Text: A
- Concepts: None provided. Please provide a proper context for the problem to be solved.

- Text: Joyal has introduced the category $\cal D$ of the so-called finite disks, and used it to define the concept of θ-category, a notion of weak ω-category
- Concepts: 'category', '$\cal D$', 'finite disks', 'θ-category', 'weak ω-category'

- Text: We introduce the notion of an ω-graph being composable (meaning roughly that 'it has a unique composite'), and call an ω-category simple if it is freely generated by a composable ω-graph
- Concepts: 'omega-graph', 'composable', 'unique composite', 'omega-category', 'freely generated', 'simple'

- Text: The category $\cal S$ of simple ω-categories is a full subcategory of the category, with strict ω-functors as morphisms, of all ω-categories

- Concepts: 'category', 'simple ω-categories', 'full subcategory', 'strict ω-functors', 'ω-categories'

- Text: The category $\cal S$ is a key ingredient in another concept of weak ω-category, called protocategory
- Concepts: 'category', 'weak ω-category', 'protocategory'

- Text: We prove that $\cal D$ and $\cal S$ are contravariantly equivalent, by a duality induced by a suitable schizophrenic object living in both categories
- Concepts: contravariantly equivalent', 'duality', 'schizophrenic object', 'categories'

- Text: In [MZ], this result is one of the tools used to show that the concept of θ-category and that of protocategory are equivalent in a suitable sense
- Concepts: θ-category, protocategory, equivalent

- Text: We also prove that composable ω-graphs coincide with the ω-graphs of the form T^* considered by M.Batanin, which were characterized by R
- Concepts: 'ω-graphs', 'composable ω-graphs', 'T^*', 'M. Batanin', 'characterized by R'

- Text: Street and called `globular cardinals'
- Concepts: None - there are no Math concepts mentioned in this context

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- Text: Batanin's construction, using globular cardinals, of the free ω-category on a globular set plays an important role in our paper
- Concepts: 'construction', 'globular cardinals', 'ω-category', 'globular set', 'free ω-category'

- Text: We give a self-contained presentation of Batanin's construction that suits our purposes.
- Concepts: 'construction', 'Batanin'

- Text: There are well-known characterizations of the hereditary quotient maps in the category of topological spaces, (that is, of quotient maps stable under pullback along embeddings), as well as of universal quotient maps (that is, of quotient maps stable under pullback)
- Concepts: 'hereditary quotient maps', 'category of topological spaces', 'quotient maps', 'pullback', 'embeddings', 'universal quotient maps'

- Text: These are precisely the so-called pseudo-open maps, as shown by Arhangel'skii, and the bi-quotient maps of Michael, as shown by Day and Kelly, respectively
- Concepts: pseudo-open maps, bi-quotient maps

- Text: In this paper hereditary and stable quotient maps are characterized in the broader context given by a category equipped with a closure operator

- Concepts: 'hereditary', 'stable quotient maps', 'category', 'closure operator'

- Text: To this end, we derive explicit formulae and conditions for the closure in the codomain of such a quotient map in terms of the closure in its domain.
- Concepts: 'closure', 'quotient map', 'codomain', 'domain'

- Text: Filtered colimits, i.e., colimits over schemes $\cal D$ such that $\cal D$-colimits in $\Set$ commute with finite limits, have a natural generalization to sifted colimits: these are colimits over schemes $\cal D$ such that $\cal D$-colimits in $\Set$ commute with finite products
- Concepts: 'filtered colimits', 'sifted colimits', 'colimits', 'schemes', 'finite limits', 'finite products'

- Text: An important example: reflexive coequalizers are sifted colimits
- Concepts: 'reflexive coequalizers', 'sifted colimits'

- Text: Generalized varieties are defined as free completions of small categories under sifted-colimits (analogously to finitely accessible categories which are free filtered-colimit completions of small categories)
- Concepts: 'generalized varieties', 'free completion', 'small categories', 'sifted-colimits', 'finitely accessible categories', 'filtered-colimit completions'

- Text: Among complete categories, generalized varieties are precisely the varieties
- Concepts: 'complete categories', 'generalized varieties', 'varieties'

- Text: Further examples: category of fields, category of linearly ordered sets, category of nonempty sets.
- Concepts: 'category', 'fields', 'linearly ordered sets', 'nonempty sets'

- Text: In this paper, we consider those morphisms $p : P\to B$ of posets for which the induced geometric morphism of presheaf toposes is exponentiable in the category of Grothendieck toposes
- Concepts: 'morphisms', 'posets', 'geometric morphism', 'presheaf toposes', 'exponentiable', 'Grothendieck toposes'

- Text: In particular, we show that a necessary condition is that the induced map $p^{\downarrow} : P^{\downarrow}\to B^{\downarrow}$ is exponentiable in the category of topological spaces, where $P^{\downarrow}$ is the space whose points are elements of P and open sets are downward closed subsets of P
- Concepts: 'induced map', 'exponentiable', 'category of topological spaces', 'points', 'elements', 'open sets', 'downward closed subsets'

- Text: Along the way, we show that $p^{\downarrow} : P^{\downarrow}\to B^{\downarrow}$ is exponentiable if and only if

$p : P\to B$ is exponentiable in the category of posets and satisfies an additional compactness condition

- Concepts: 'exponentiable', 'category of posets', 'compactness condition'

- Text: The criteria for exponentiability of morphisms of posets is related to (but weaker than) the factorization-lifting property for exponentiability of morphisms in the category of small categories (considered independently by Giraud and Conduché).
- Concepts: 'exponentiability', 'morphisms', 'posets', 'factorization-lifting property', 'category', 'small categories', 'Giraud', 'Conduché'

- Text: We characterize n-permutable locally finitely presentable categories $Lex[{\mathcal C}^{op}, Set]$ by a condition on the dual of the essentially algebraic theory $\mathcal C^{op}$
- Concepts: 'locally finitely presentable categories', '$Lex[{\mathcal C}^{op}, Set$', 'dual', 'essentially algebraic theory'

- Text: We apply these results to exact Maltsev categories as well as to n-permutable quasivarieties and varieties.
- Concepts: 'Maltsev categories', 'quasivarieties', 'varieties', 'n-permutable'

- Text: To a bicategory B (in the sense of Bénabou) we assign a simplicial set Ner(B), the (geometric) nerve of B, which completely encodes the structure of B as a bicategory
- Concepts: bicategory, simplicial set, nerve, geometric nerve

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- Text: As a simplicial set Ner(B) is a subcomplex of its 2-Coskeleton and itself isomorphic to its 3-Coskeleton, what we call a 2-dimensional Postnikov complex
- Concepts: 'simplicial set', 'subcomplex', '2-Coskeleton', '3-Coskeleton', 'Postnikov complex'

- Text: We then give, somewhat more delicately, a complete characterization of those simplicial sets which are the nerves of bicategories as certain 2-dimensional Postnikov complexes which satisfy certain restricted `exact horn-lifting' conditions whose satisfaction is controlled by (and here defines) subsets of (abstractly) invertible 2 and 1-simplices
- Concepts: 'simplicial sets', 'nerves', 'bicategories', 'Postnikov complexes', 'exact horn-lifting', 'invertible', '2-simplices', '1-simplices'

- Text: Those complexes which have, at minimum, their degenerate 2-simplices always invertible and have an invertible 2-simplex $\chi_2^1(x_{12}, x_{01})$ present for each `composable pair' $(x_{12}, \_ , x_{01}) \in \mhorn_2^1$ are exactly the nerves of bicategories
- Concepts: 'complexes', 'invertible', '2-simplex', 'χ_2^1', 'composable pair', '$\mhorn_2^1$', 'nerves', 'bicategories'

- Text: At the other extreme, where all 2 and 1-simplices are invertible, are those Kan complexes in which the Kan conditions are satisfied exactly in all dimensions >2

- Concepts: 'Kan complexes', '2-simplices', '1-simplices', 'invertible', 'Kan conditions', 'dimensions'

- Text: These are exactly the nerves of bigroupoids - all 2-cells are isomorphisms and all 1-cells are equivalences.
- Concepts: 'bigroupoids', 'nerves'

- Text: The alternation hierarchy problem asks whether every μ-term ϕ, that is, a term built up also using a least fixed point constructor as well as a greatest fixed point constructor, is equivalent to a μ-term where the number of nested fixed points of a different type is bounded by a constant independent of ϕ. In this paper we give a proof that the alternation hierarchy for the theory of μ-lattices is strict, meaning that such a constant does not exist if μ-terms are built up from the basic lattice operations and are interpreted as expected
- Concepts: 'alternation', 'hierarchy problem', 'μ-term', 'least fixed point constructor', 'greatest fixed point constructor', 'equivalence', 'nested fixed points', 'constant', 'theory', 'μ-lattices', 'strict', 'basic lattice operations'

- Text: The proof relies on the explicit characterization of free μ-lattices by means of games and strategies.
- Concepts: μ-lattices', 'free μ-lattices', 'characterization', 'games', 'strategies'

- Text: We analyse the classical property of centrality of equivalence relations in terms of normal monomorphisms

- Concepts: 'centrality', 'equivalence relations', 'normal monomorphisms'

- Text: For this purpose, the internal structure of connector is introduced, allowing to clarify classical results in Maltsev categories and to prove new ones in protomodular categories
- Concepts: 'internal structure', 'connector', 'Maltsev categories', 'protomodular categories'

- Text: This approach allows to work in the general context of finitely complete categories, without requiring the usual Barr exactness assumption.
- Concepts: 'finitely complete categories', 'Barr exactness assumption'

- Text: In connection with the so-called Hurwitz action of homeomorphisms in ramified covers we define a groupoid, which we call a ramification groupoid of the 2-sphere, constructed as a certain path groupoid of the universal ramified cover of the 2-sphere with finitely many marked-points
- Concepts: 'Hurwitz action', 'homeomorphisms', 'ramified covers', 'groupoid', 'path groupoid', 'universal ramified cover', 'marked-points'

- Text: Our approach to ramified covers is based on cosheaf spaces, which are closely related to Fox's complete spreads
- Concepts: 'ramified covers', 'cosheaf spaces', 'Fox's complete spreads'

- Text: A feature of a ramification groupoid is that it carries a certain order structure
- Concepts: 'ramification groupoid', 'order structure'

- Text: The Artin group of braids of n strands has an order-invariant action in the ramification groupoid of the sphere with $n+1$ marked-points
- Concepts: 'Artin group', 'braids', 'order-invariant action', 'ramification', 'groupoid', 'sphere', 'marked-points'

- Text: Left-invariant linear orderings of the braid group such as the Dehornoy ordering may be retrieved
- Concepts: 'linear orderings', 'braid group', 'Dehornoy ordering'

- Text: Our work extends naturally to the braid group on countably many generators
- Concepts: 'braid group', 'countably many generators'

- Text: In particular, we show that the underlying set of a free group on countably many generators (minus the identity element) can be linearly ordered in such a way that the classical Artin representation of a braid as an automorphism of the free group is an order-preserving action.
- Concepts: 'free group', 'countably many generators', 'identity element', 'linearly ordered', 'classical Artin representation', 'braid', 'automorphism', 'order-preserving'

- Text: In the present article we continue recent work in the direction of domain theory were certain (accessible) categories are used as generalized domains
- Concepts: 'domain theory', 'categories', 'generalized domains'

- Text: We discuss the possibility of using certain presheaf toposes as generalizations of the Scott topology at this level
- Concepts: 'presheaf toposes', 'generalizations', 'Scott topology'

- Text: We show that the toposes associated with Scott complete categories are injective with respect to dense inclusions of toposes
- Concepts: 'toposes', 'Scott complete categories', 'injective', 'dense inclusions'

- Text: We propose analogues of the upper and lower powerdomain in terms of the Scott topology at the level of categories
- Concepts: 'analogues', 'upper powerdomain', 'lower powerdomain', 'Scott topology', 'categories'

- Text: We show that the class of finitely accessible categories is closed under this generalized upper powerdomain construction (the respective result about the lower powerdomain construction is essentially known)
- Concepts: 'finitely accessible categories', 'upper powerdomain construction', 'lower powerdomain construction'

- Text: We also treat the notion of ``coherent domain'' by introducing two possible notions of coherence for a finitely accessible category (qua generalized domain)
- Concepts: 'coherent domain', 'finitely accessible category', 'generalized domain', 'notions of coherence'

- Text: The one of them imitates the stability of the compact saturated sets under intersection and the other one imitates the so-called ``2/3 SFP'' property
- Concepts: 'stability', 'compact', 'saturated sets', 'intersection', '2/3 SFP'

- Text: We show that the two notions are equivalent
- Concepts: equivalent, notions

- Text: This amounts to characterizing the small categories whose free cocompletion under finite colimits has finite limits.
- Concepts: 'small categories', 'free cocompletion', 'finite colimits', 'finite limits'

- Text: In this paper we show how collapsing schemes can give us information on the homotopy type of the classifying space of a small category, when this category is presented by a complete rewrite system.
- Concepts: collapsing scheme, homotopy type, classifying space, small category, complete rewrite system

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- Text: An action $* : \cal V \times \cal A \to \cal A$ of a monoidal category $\cal V$ on a category $\cal A$ corresponds to a strong monoidal functor $F : \cal V \to [\cal A,\cal A]$ into the monoidal category of endofunctors of $\cal A$
- Concepts: 'action', 'monoidal category', 'category', 'strong monoidal functor', 'endofunctors'

- Text: In many practical cases, the ordinary functor $f : \cal V \to [cal \A, \cal A]$ underlying the monoidal F has a right adjoint g; and when this is so, F itself has a right adjoint G as a monoidal functor - so that, passing to the categories of monoids (also called ``algebras'') in $\cal V$ and in $[\cal A, \cal A]$, we have an adjunction $Mon F$ left adjoint to $Mon G$ between the category $Mon \cal V$ of monoids in $\cal V$ and the category $Mon [\cal A, \cal A] = Mnd \cal A$ of monads on $\cal A$
- Concepts: 'monoidal functor', 'right adjoint', 'monoids', 'algebras', 'categories', 'monads'

- Text: We give sufficient conditions for the existence of the right adjoint g, which involve the existence of right adjoints for the functors $X * - $ and $ * A$, and make $\cal A$ (at least when $\cal V$ is symmetric and closed) into a tensored and cotensored $cal \V$-category ${\bf A}$
- Concepts: right adjoint, functors, tensored category, cotensored category

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- Text: We give explicit formulae, as large ends, for the right adjoints g and $Mon G$, and also for some related right adjoints, when they exist; as well as another explicit expression for $Mon G$ as a large limit, which uses a new representation of any (large) limit of monads of two special kinds, and an analogous result for general endofunctors.

- Concepts: 'right adjoints', 'large ends', 'Mon G', 'limit', 'monads', 'endofunctors'

- Text: The interpretation by Duskin and Glenn of abelian sheaf cohomology as connected components of a category of torsors is extended to homotopy classes
- Concepts: 'abelian sheaf cohomology', 'category of torsors', 'homotopy classes'

- Text: This is simultaneously an extension of Verdier's version of Cech cohomology to homotopy.
- Concepts: 'Verdier', 'Cech cohomology', 'homotopy'

- Text: Exact sequences are a well known notion in homological algebra
- Concepts: 'exact sequences', 'homological algebra'

- Text: We investigate here the more vague properties of `homotopical exactness', appearing for instance in the fibre or cofibre sequence of a map
- Concepts: 'homotopical', 'exactness', 'fibre', 'cofibre sequence'

- Text: Such notions of exactness can be given for very general `categories with homotopies' having homotopy kernels and cokernels, but become more interesting under suitable `stability' hypotheses, satisfied - in particular - by chain complexes

- Concepts: 'categories with homotopies', 'homotopy kernels', 'homotopy cokernels', 'stability', 'chain complexes'

- Text: It is then possible to measure the default of homotopical exactness of a sequence by the homotopy type of a certain object, a sort of `homotopical homology'.
- Concepts: 'homotopical exactness', 'sequence', 'homotopy type', 'homotopical homology'

- Text: We give a unified proof of Gabriel-Ulmer duality for locally finitely presentable categories, Adamek-Lawvere-Rosicky duality for varieties and Morita duality for presheaf categories
- Concepts: 'Gabriel-Ulmer duality', 'locally finitely presentable', 'categories', 'Adamek-Lawvere-Rosicky duality', 'varieties', 'Morita duality', 'presheaf categories'

- Text: As an application, we compare presheaf categories and varieties.
- Concepts: 'presheaf categories', 'varieties'

- Text: In the context of synthetic differential geometry, we study the Laplace operator an a Riemannian manifold
- Concepts: 'synthetic differential geometry', 'Laplace operator', 'Riemannian manifold'

- Text: The main new aspect is a neighbourhood of the diagonal, smaller than the second neighbourhood usually required as support for second order differential operators
- Concepts: 'neighbourhood', 'diagonal', 'support', 'second order differential operators'

- Text: The new neighbourhood has the property that a function is affine on it if and only if it is harmonic.
- Concepts: 'affine', 'function', 'harmonic'

- Text: Let V be a symmetric monoidal closed category with a suitably compatible simplicial model category structure
- Concepts: 'symmetric monoidal closed category', 'simplicial model category structure'

- Text: We show how to extend Dwyer and Kan's notion of simplicial localization to V-categories
- Concepts: 'simplicial localization', 'V-categories'

- Text: This may for instance be applied to the case where our categories are enriched in suitable models for spectra.
- Concepts: 'enriched categories', 'models for spectra'

- Text: Hopf monads are identified with monads in the 2-category Opmon of monoidal categories, opmonoidal functors and transformations
- Concepts: 'Hopf monads', 'monads', '2-category', 'Opmon', 'monoidal categories', 'opmonoidal functors', 'transformations'

- Text: Using Eilenberg-Moore objects, it is shown that for a Hopf monad S, the categories Alg(Coalg(S)) and Coalg(Alg(S)) are canonically isomorphic
- Concepts: 'Eilenberg-Moore objects', 'Hopf monad', 'categories', 'Alg', 'Coalg', 'canonically isomorphic'

- Text: The monadic arrows Opmon are then characterized
- Concepts: 'monadic arrows'

- Text: Finally, the theory of multicategories and a generalization of structure and semantics are used to identify the categories of algebras of Hopf monads.
- Concepts: 'multicategories', 'generalization', 'structure', 'semantics', 'categories', 'algebras', 'Hopf monads'

- Text: Given a triple T on a complete category C and a factorization system E/M on the category of algebras, we show there is a 1-1 correspondence between full subcategories of the category of algebras that are closed under U-split epimorphisms, products, and M-subobjects and triple morphisms T -> S for which the induced natural transformation between free functors belongs to E.
- Concepts: 'triple', 'complete category', 'factorization system', 'algebras', 'U-split epimorphisms', 'products', 'M-subobjects', 'induced natural transformation', 'free functors', 'correspondence'

- Text: We give a definition of categorical model for the multiplicative fragment of non-commutative logic

- Concepts: 'categorical model', 'multiplicative fragment', 'non-commutative logic'

- Text: We call such structures entropic categories
- Concepts: 'entropic categories'

- Text: We demonstrate the soundness and completeness of our axiomatization with respect to cut-elimination
- Concepts: 'soundness', 'completeness', 'axiomatization', 'cut-elimination'

- Text: We then focus on several methods of building entropic categories
- Concepts: 'entropic categories', 'building'

- Text: Our first models are constructed via the notion of a partial bimonoid acting on a cocomplete category
- Concepts: 'partial bimonoid', 'cocomplete category'

- Text: We also explore an entropic version of the Chu construction, and apply it in this setting. It has recently been demonstrated that Hopf algebras provide an excellent framework for modeling a number of variants of multiplicative linear logic, such as commutative, braided and cyclic
- Concepts: Chu construction', 'entropic version', 'Hopf algebras', 'multiplicative linear logic', 'commutative', 'braided', 'cyclic'

- Text: We extend these ideas to the entropic setting by developing a new type of Hopf algebra, which we call entropic Hopf algebras
- Concepts: 'entropic setting', 'Hopf algebra', 'entropic Hopf algebras'

- Text: We show that the category of modules over an entropic Hopf algebra is an entropic category (possibly after application of the Chu construction)
- Concepts: 'category', 'modules', 'entropic', 'Hopf algebra', 'Chu construction'

- Text: Several examples are discussed, based first on the notion of a bigroup
- Concepts: 'bigroup'

- Text: Finally the Tannaka-Krein reconstruction theorem is extended to the entropic setting.
- Concepts: 'Tannaka-Krein reconstruction theorem', 'entropic setting'

- Text: By abstract Stone duality we mean that the topology or contravariant powerset functor, seen as a self-adjoint exponential $\Sigma^{(-)}$ on some category, is monadic
- Concepts: abstract Stone duality', 'topology', 'contravariant powerset functor', 'self-adjoint', 'exponential', 'category', 'monadic'

- Text: Using Beck's theorem, this means that certain equalisers exist and carry the subspace topology
- Concepts: Beck's theorem', 'equalisers', 'subspace topology'

- Text: These subspaces are encoded by idempotents that play a role similar to that of nuclei in locale theory. Paré showed that any elementary topos has this duality, and we prove it intuitionistically for the category of locally compact locales. The paper is largely concerned with the construction of such a category out of one that merely has powers of some fixed object Σ
- Concepts: 'idempotents', 'locale theory', 'elementary topos', 'duality', 'category', 'locally compact locales', 'construction', 'powers'

- Text: It builds on Sober Spaces and Continuations, where the related but weaker notion of abstract sobriety was considered
- Concepts: Sober Spaces', 'Continuations', 'abstract sobriety'

- Text: The construction is done first by formally adjoining certain equalisers that $\Sigma^{(-)}$ takes to coequalisers, then using Eilenberg-Moore algebras, and finally presented as a lambda calculus similar to the axiom of comprehension in set theory. The comprehension calculus has a normalisation theorem, by which every type can be embedded as a subspace of a type formed without comprehension, and terms also normalise in a simple way
- Concepts: 'formally adjoining', 'equalisers', 'coequalisers', 'Eilenberg-Moore algebras', 'lambda calculus', 'axiom of comprehension', 'set theory', 'comprehension calculus',

'normalisation theorem', 'type', 'terms'

- Text: The symbolic and categorical structures are thereby shown to be equivalent. Finally, sums and certain quotients are constructed using the comprehension calculus, giving an extensive category.
- Concepts: symbolic structures, categorical structures, equivalence, sums, quotients, comprehension calculus, category

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- Text: It is proved that any category $\cal{K}$ which is equivalent to a simultaneously reflective and coreflective full subcategory of presheaves $[\cal{A}^{op},Set]$, is itself equivalent to the category of the form $[\cal{B}^{op},Set]$ and the inclusion is induced by a functor $\cal{A} \to \cal{B}$ which is surjective on objects
- Concepts: category, presheaves, reflective, coreflective, full subcategory, functor, surjective, objects

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- Text: We obtain a characterization of such functors. Moreover, the base category Set can be replaced with any symmetric monoidal closed category V which is complete and cocomplete, and then analogy of the above result holds if we replace categories by V-categories and functors by V-functors. As a consequence we are able to derive well-known results on simultaneously reflective and coreflective categories of sets, Abelian groups, etc.
- Concepts: 'functors', 'category', 'symmetric monoidal closed category', 'complete', 'cocomplete', 'V-categories', 'V-functors',

'reflective', 'coreflective', 'sets', 'Abelian groups'

- Text: This paper defines flows (or discrete dynamical systems) and cyclic flows in a category and investigates how the trajectories of a point might approach a cycle
- Concepts: 'flows', 'discrete dynamical systems', 'cyclic flows', 'category', 'trajectories', 'point', 'cycle'

- Text: The paper considers cyclic flows in the categories of Sets and of Boolean algebras and their duals and characterizes the Stone representation of a cyclic flow in Boolean algebras
- Concepts: 'cyclic flows', 'categories', 'Sets', 'Boolean algebras', 'duals', 'Stone representation'

- Text: A cyclic spectrum is constructed for Boolean flows
- Concepts: 'cyclic spectrum', 'Boolean flows'

- Text: Examples include attractive fixpoints, repulsive fixpoints, strange attractors and the logistic equation.
- Concepts: 'attractive fixpoints', 'repulsive fixpoints', 'strange attractors', 'logistic equation'

- Text: Directed Algebraic Topology studies phenomena where privileged directions appear, derived from the analysis of concurrency, traffic networks, space-time models, etc. This is the sequel of a paper, `Directed homotopy theory, I
- Concepts: 'Directed Algebraic Topology', 'directions', 'concurrency', 'traffic networks', 'space-time models', 'Directed

homotopy theory'

- Text: The fundamental category', where we introduced directed spaces, their non reversible homotopies and their fundamental category
- Concepts: 'fundamental category', 'directed spaces', 'non reversible homotopies'

- Text: Here we study some basic constructs of homotopy, like homotopy pushouts and pullbacks, mapping cones and homotopy fibres, suspensions and loops, cofibre and fibre sequences.
- Concepts: 'homotopy', 'homotopy pushouts', 'homotopy pullbacks', 'mapping cones', 'homotopy fibres', 'suspensions', 'loops', 'cofibre sequences', 'fibre sequences'

- Text: A topological space is sober if it has exactly the points that are dictated by its open sets
- Concepts: 'topological space', 'sober', 'points', 'open sets'

- Text: We explain the analogy with the way in which computational values are determined by the observations that can be made of them
- Concepts: computation, values, observations

- Text: A new definition of sobriety is formulated in terms of lambda calculus and elementary category theory, with no reference to lattice structure, but, for topological spaces, this coincides with the standard lattice-theoretic definition

- Concepts: 'sobriety', 'lambda calculus', 'elementary category theory', 'topological spaces', 'lattice structure', 'standard lattice-theoretic definition'

- Text: The primitive symbolic and categorical structures are extended to make their types sober
- Concepts: 'primitive', 'symbolic structures', 'categorical structures', 'types', 'sober'

- Text: For the natural numbers, the additional structure provides definition by description and general recursion. We use the same basic categorical construction that Thielecke, Fuhrmann and Selinger use to study continuations, but our emphasis is completely different: we concentrate on the fragment of their calculus that excludes computational effects, but show how it nevertheless defines new denotational values
- Concepts: 'natural numbers', 'categorical construction', 'continuations', 'calculus', 'denotational values'

- Text: Nor is this ``denotational semantics of continuations using sober spaces'', though that could easily be derived. On the contrary, this paper provides the underlying λ-calculus on the basis of which abstract Stone duality will re-axiomatise general topology
- Concepts: denotational semantics, continuations, sober spaces, λ-calculus, Stone duality, general topology

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- Text: The leading model of the new axioms is the category of locally compact locales and continuous maps.
- Concepts: 'category', 'locally compact locales', 'continuous maps'

- Text: Goguen categories were introduced in as a suitable categorical description of ${\mathcal L}$-fuzzy relations, i.e., of relations taking values from an arbitrary complete Brouwerian lattice ${\mathcal L}$ instead of the unit interval $[0,1]$ of the real numbers
- Concepts: 'Goguen categories', 'categorical description', 'fuzzy relations', 'complete Brouwerian lattice'

- Text: In this paper we want to study operations on morphisms of a Goguen category which are derived from suitable binary functions on the underlying lattice of scalar elements, i.e., on the abstract counterpart of ${\mathcal L}$.
- Concepts: 'Goguen category', 'morphisms', 'binary functions', 'underlying lattice', 'scalar elements', 'abstract counterpart'

- Text: a Injectivity with respect to morphisms having λ-presentable domains and codomains is characterized: such injectivity classes are precisely those closed under products, λ-directed colimits, and λ-pure subobjects
- Concepts: Injectivity, morphisms, λ-presentable, domains, codomains, products, λ-directed colimits, λ-pure subobjects

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- Text: This sharpens the result of the first two authors (Trans

- Concepts: result

- Text: Amer
- Concepts: There do not seem to be any math concepts in this context.

- Text: Math
- Concepts: math (there are no specific math concepts mentioned in the context)

- Text: Soc
- Concepts: None - there is no relevant context or information provided to extract any math concepts.

- Text: 336 (1993), 785-804)
- Concepts: None found as the given context is a citation/reference and does not contain any specific math concepts.

- Text: In contrast, for geometric logic an example is found of a class closed under directed colimits and pure subobjects, but not axiomatizable by a geometric theory
- Concepts: geometric logic, directed colimits, pure subobjects, axiomatizable, geometric theory

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- Text: A more technical characterization of axiomatizable classes in geometric logic is presented.
- Concepts: 'axiomatizable classes', 'geometric logic'

- Text: We prove that pure morphisms of commutative rings are effective A-descent morphisms where A is a (COMMUTATIVE RINGS)^op-indexed category given by (i) finitely generated modules, or (ii) flat modules, or (iii) finitely generated flat modules, or (iv) finitely generated projective modules.
- Concepts: 'pure morphisms', 'commutative rings', 'A-descent morphisms', 'finitely generated modules', 'flat modules', 'finitely generated flat modules', 'finitely generated projective modules'

- Text: We investigate the effect on Cauchy complete objects of the change of base 2-functor ${\cal V}-Cat \rightarrow {\cal W}-Cat$ induced by a two-sided enrichment ${\cal V} \rightarrow {\cal W}$
- Concepts: 'Cauchy complete', 'base 2-functor', 'enrichment'

- Text: We restrict our study to the case of locally partially ordered bases
- Concepts: 'locally partially ordered bases'

- Text: The reversibility notion introduced by Walters is extended to two-sided enrichments and Cauchy completion
- Concepts: 'reversibility', 'two-sided enrichments', 'Cauchy completion'

- Text: We show that a reversible left adjoint two-sided enrichment $F: {\cal V} \rightarrow {\cal W}$ between locally partially ordered reversible bicategories induces an adjunction $F_{\sim} \dashv

F^{\sim}: \VSkCRcCat \rightharpoonup \WSkCRcCat$ between sub-categories of skeletal and Cauchy-reversible complete enrichments

- Concepts: reversible, left adjoint, two-sided enrichment, locally partially ordered, bicategories, adjunction, skeletal, Cauchy-reversible, complete enrichments

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- Text: We give two applications: sheaves over locales and group actions.
- Concepts: 'sheaves', 'locales', 'group actions'

- Text: Every chain functor A_*, admits a L-colocalization A^L_* which (in contrast to the case of L-localizations) in general does not allow a realization as a spectrum (even if A_* stems from a spectrum itself)
- Concepts: 'chain functor', 'L-colocalization', 'realization', 'spectrum'

- Text: The $[E,]_*$- colocalization of A
- Concepts: '$[E, _*$', 'colocalization'

- Text: K
- Concepts: No math concepts are present in this context.

- Text: Bousfield is retrieved as a special case of a general colocalization process for chain functors.
- Concepts: Bousfield, colocalization process, chain functors

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- Text: For the 2-monad $((-)^2,I,C)$ on CAT, with unit I described by identities and multiplication C described by composition, we show that a functor $F : {\cal K}^2 \rightarrow \cal K$ satisfying $FI_{\cal K} = 1_{\cal K}$ admits a unique, normal, pseudo-algebra structure for $(-)^2$ if and only if there is a mere natural isomorphism $F F^2 \rightarrow F C_{\cal K}$
- Concepts: '2-monad', 'unit', 'identities', 'multiplication', 'composition', 'functor', 'normal', 'pseudo-algebra structure', 'natural isomorphism'

- Text: We show that when this is the case the set of all natural transformations $F F^2 \rightarrow F C_{\cal K}$ forms a commutative monoid isomorphic to the centre of $\cal K$.
- Concepts: natural transformations, commutative monoid, centre of $\cal K$

- Text: In this paper we describe a deductive system for categories with finite products and coproducts, prove decidability of equality of morphisms via cut elimination, and prove a ``Whitman theorem'' for the free such categories over arbitrary base categories
- Concepts: deductive system, categories, finite products, coproducts, decidability, equality of morphisms, cut elimination, Whitman theorem, free categories, base categories

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- Text: This result provides a nice illustration of some basic techniques in categorical proof theory, and also seems to have slipped past unproved in previous work in this field

- Concepts: 'categorical proof theory', 'basic techniques'

- Text: Furthermore, it suggests a type-theoretic approach to 2-player input-output games.
- Concepts: 'type-theoretic approach', '2-player input-output games'

- Text: Two proofs of the exponentiability of perfect maps are presented and compared to two other recent approaches
- Concepts: 'exponentiability', 'perfect maps', 'proofs', 'approaches'

- Text: One of the proofs is an elementaryapproach including a direct construction of the exponentials
- Concepts: 'proofs', 'elementary approach', 'direct construction', 'exponentials'

- Text: The other, implicit in the literature, uses internal locales in the topos of set-valued sheaves on a topological space.
- Concepts: 'internal locales', 'topos', 'set-valued sheaves', 'topological space'

- Text: Using the long exact sequence of nonabelian derived functors, an eight term exact sequence of Lie algebra homology with $\Lambda/q\Lambda$ coefficients is obtained, where Λ is a ground ring and q is a nonnegative integer
- Concepts: 'long exact sequence', 'nonabelian derived functors', 'Lie algebra homology', 'ground ring', 'nonnegative integer'

- Text: Hopf formulas for the second and third homology of a Lie algebra are proved
- Concepts: 'Homology', 'Lie algebra', 'Hopf formulas'

- Text: The condition for the existence and the description of the universal q-central relative extension of a Lie epimorphism in terms of relative homologies are given.
- Concepts: 'universal', 'q-central', 'Lie epimorphism', 'relative homologies'

- Text: Entity-Relationship-Attribute ideas are commonly used to specify and design information systems
- Concepts: 'Entity-Relationship-Attribute', 'information systems', 'specify', 'design'

- Text: They use a graphical technique for displaying the objects of the system and relationships among them
- Concepts: 'graphical technique'

- Text: The design process can be enhanced by specifying constraints of the system and the natural environment for these is the categorical notion of sketch
- Concepts: 'design process', 'constraints', 'system', 'natural environment', 'categorical notion', 'sketch'

- Text: Here we argue that the finite-limit, finite-sum sketches with a terminal node are the appropriate class and call them EA sketches

- Concepts: 'finite-limit', 'finite-sum', 'sketches', 'terminal node', 'EA sketches'

- Text: A model for an EA sketch in a lextensive category is a `snapshot' of a database with values in that category
- Concepts: 'EA sketch', 'lextensive category', 'model', 'snapshot', 'database'

- Text: The category of models of an EA sketch is an object of models of the sketch in a 2-category of lextensive categories
- Concepts: 'EA sketch', 'category', 'models', '2-category', 'lextensive categories'

- Text: Moreover, modelling the same sketch in certain objects in other 2-categories defines both the query language for the database and the updates (the dynamics) for the database.
- Concepts: 2-categories', 'query language', 'updates', 'database', 'modelling', 'objects'

- Text: We associate to a Hausdorff space, $ X $, a double groupoid, $ \mbox{\boldmath $ \rho $}^{\square}_{2} (X) $, the homotopy double groupoid of $ X $
- Concepts: 'Hausdorff space', 'double groupoid', 'homotopy double groupoid'

- Text: The construction is based on the geometric notion of thin square
- Concepts: 'construction', 'geometric notion', 'thin square'

- Text: Under the equivalence of categories between small $ 2 $-categories and double categories with connection the homotopy double groupoid corresponds to the homotopy 2- groupoid, $ {\bf G}_{2} (X) $
- Concepts: '2-categories', 'double categories', 'connection', 'homotopy double groupoid', 'homotopy 2-groupoid', '$ {\bf G}_{2} (X)$'

- Text: The cubical nature of $ \mbox{\boldmath $ \rho $}^{\square}_{2} (X) $ as opposed to the globular nature of $ {\bf G}_{2} (X) $ should provide a convenient tool when handling `local-to-global' problems as encountered in a generalised van Kampen theorem and dealing with tensor products and enrichments of the category of compactly generated Hausdorff spaces.
- Concepts: cubical nature, globular nature, van Kampen theorem, tensor product, enrichment, category of compactly generated Hausdorff spaces

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- Text: Many people have proposed definitions of `weak n-category'
- Concepts: 'weak n-category'

- Text: Ten of them are presented here
- Concepts: None - the context does not provide any information about math concepts.

- Text: Each definition is given in two pages, with a further two pages on what happens when $n\leq 2$
- Concepts: 'definition', '$n\leq 2$'

- Text: The definitions can be read independently
- Concepts: definitions'

- Text: Chatty bibliography follows.
- Concepts: None - the context does not mention any math concepts.

- Text: Codescent morphisms are described in regular categories which satisfy the so-called strong amalgamation property
- Concepts: 'codescent morphisms', 'regular categories', 'strong amalgamation property'

- Text: Among varieties of universal algebras possessing this property are, as is known, categories of groups, not necessarily associative rings, M-sets (for a monoid M), Lie algebras (over a field), quasi-groups, commutative quasi-groups, Steiner quasi-groups, medial quasi-groups, semilattice$lattices, weakly associative lattices, Boolean algebras, Heyting algebras
- Concepts: 'universal algebras', 'categories of groups', 'associative rings', 'M-sets', 'monoid', 'Lie algebras', 'quasi-groups', 'commutative quasi-groups', 'Steiner quasi-groups', 'medial quasi-groups', 'semilattice lattices', 'weakly associative lattices', 'Boolean algebras', 'Heyting algebras'

- Text: It is shown that every codescent morphism of groups is effective.
- Concepts: 'codescent', 'morphism', 'groups', 'effective'

- Text: We generalize Dress and Müller's main result in Decomposable functors and the exponential principle
- Concepts: generalize, decomposable functors, exponential principle

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- Text: We observe that their result can be seen as a characterization of free algebras for certain monad on the category of species
- Concepts: 'free algebras', 'monad', 'category', 'species'

- Text: This perspective allows to formulate a general exponential principle in a symmetric monoidal category
- Concepts: 'exponential principle', 'symmetric monoidal category'

- Text: We show that for any groupoid G, the category of presheaves on the symmetric monoidal completion !G of G satisfies the exponential principle
- Concepts: 'groupoid', 'presheaves', 'symmetric monoidal completion', 'exponential principle'

- Text: The main result in Dress and Müller reduces to the case G = 1
- Concepts: 'reduces', 'case', 'G = 1'

- Text: We discuss two notions of functor between categories satisfying the exponential principle and express some well known combinatorial identities as instances of the preservation properties of these functors
- Concepts: functor, categories, exponential principle, combinatorial identities, preservation properties

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- Text: Finally, we give a characterization of G as a subcategory of presheaves on !G.
- Concepts: 'category', 'subcategory', 'presheaves'

- Text: A specific property applicable to subsets of a hom-set in any small category is defined
- Concepts: 'hom-set', 'small category'

- Text: Subsets with this property are called composition-representative
- Concepts: subsets, composition-representative

- Text: The notion of composition-representability is motivated both by the representability of a linear functional on an associative algebra, and, by the recognizability of a subset of a monoid
- Concepts: 'composition-representability', 'linear functional', 'associative algebra', 'recognizability', 'subset', 'monoid'

- Text: Various characterizations are provided which therefore may be regarded as analogs of certain characterizations for representability and recognizablity

- Concepts: 'representability', 'recognizability', 'analog'

- Text: As an application, the special case of an algebraic theory T is considered and simple characterizations for a recognizable forest are given
- Concepts: 'algebraic theory', 'recognizable forest', 'characterizations'

- Text: In particular, it is shown that the composition-representative subsets of the hom-set T([1],[0]), the set of all trees, are the recognizable forests and that they, in turn, are characterized by a corresponding finite `syntactic congruence.' Using a decomposition result (proved here), the composition-representative subsets of the hom-set T([m],[0]), (0 \leq m) are shown to be finite unions of m-fold (cartesian) products of recognizable forests.
- Concepts: hom-set, trees, recognizable forests, syntactic congruence, cartesian products

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- Text: This paper studies lax higher dimensional structure over bicategories
- Concepts: 'lax higher dimensional structure', 'bicategories'

- Text: The general notion of a module between two morphisms of bicategories is described
- Concepts: 'general notion', 'module', 'morphisms', 'bicategories'

- Text: These modules together with their (multi-)2-cells, which we call modulations, organize themselves into a multi-bicategory
- Concepts: 'modules', 'multi-2-cells', 'modulations', 'multi-bicategory'

- Text: The usual notion of a module can be recovered from this general notion by simply choosing the domain bicategory to be the terminal or final bicategory. The composite of two such modules need not exist
- Concepts: module, bicategory, terminal bicategory, final bicategory, composite

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- Text: However, when the domain bicategory is small and the codomain bicategory is locally cocomplete then the composite of any two modules does exist and has a simple construction using the local colimits
- Concepts: 'bicategory', 'locally cocomplete', 'composite', 'module', 'local colimits'

- Text: These modules and their modulations then give rise to a bicategory. Recall that neither transformations nor optransformations (respectively lax natural transformations and oplax natural transformations) between morphisms of bicategories give rise to a smooth 3-dimensional structure
- Concepts: 'modules', 'modulations', 'bicategory', 'transformations', 'optransformations', 'lax natural transformations', 'oplax natural transformations', 'smooth 3-dimensional structure'

- Text: However, there is a smooth 3-dimensional structure for modules, and both transformations and optransformations give rise to associated modules
- Concepts: 'smooth 3-dimensional structure', 'modules', 'transformations', 'optransformations', 'associated modules'

- Text: Furthermore, the modulations between two modules associated with transformations can then be described directly as a new sort of modification between the transformations
- Concepts: 'modulations', 'modules', 'transformations', 'modification'

- Text: This provides a locally full and faithful homomorphism from transformations and modifications into the bicategory of modules. Finally, if each 1-cell component of a transformation is a left-adjoint then the right-adjoints provide an optransformation
- Concepts: 'homomorphism', 'bicategory', 'modules', 'transformations', 'modifications', 'left-adjoint', 'right-adjoints', 'optransformation'

- Text: In the module bicategory the module associated with this optransformation is right-adjoint to the module associated with the transformation
- Concepts: 'module bicategory', 'optransformation', 'module', 'right-adjoint', 'transformation'

- Text: Therefore the inclusion of transformations whose 1-cells have left adjoints into the (multi-)bicategory of modules provides a source of proarrow equipment.

- Concepts: 'left adjoints', '(multi-)bicategory', 'modules', 'proarrow equipment'

- Text: We give an explicit construction of the category Opetope of opetopes
- Concepts: 'explicit construction', 'category', 'opetope', 'opetopes'

- Text: We prove that the category of opetopic sets is equivalent to the category of presheaves over Opetope.
- Concepts: 'opetopic sets', 'presheaves', 'Opetope'

- Text: For a complete cartesian-closed category V with coproducts, and for any pointed endofunctor T of the category of sets satisfying a suitable Beck-Chevalley-type condition, it is shown that the category of lax reflexive (T,V)-algebras is a quasitopos
- Concepts: 'complete cartesian-closed category', 'coproducts', 'pointed endofunctor', 'Beck-Chevalley-type condition', 'lax reflexive', '(T,V)-algebras', 'quasitopos'

- Text: This result encompasses many known and new examples of quasitopoi.
- Concepts: 'quasitopoi'

- Text: We take some first steps in providing a synthetic theory of distributions
- Concepts: 'synthetic theory', 'distributions'

- Text: In particular, we are interested in the use of distribution theory as foundation, not just as tool, in the study of the wave equation.
- Concepts: 'distribution theory', 'foundation', 'study', 'wave equation'

- Text: We introduce various notions of partial topos, i.e
- Concepts: 'partial topos'

- Text: `topos without terminal object'
- Concepts: 'topos', 'terminal object'

- Text: The strongest one, called local topos, is motivated by the key examples of finite trees and sheaves with compact support
- Concepts: 'local topos', 'finite trees', 'sheaves', 'compact support'

- Text: Local toposes satisfy all the usual exactness properties of toposes but are neither cartesian closed nor have a subobject classifier
- Concepts: 'Local toposes', 'exactness properties', 'cartesian closed', 'subobject classifier'

- Text: Examples for the weaker notions are local homeomorphisms and discrete fibrations
- Concepts: local homeomorphisms', 'discrete fibrations'

- Text: Finally, for partial toposes with supports we show how they can be completed to toposes via an inverse limit construction.

- Concepts: 'partial topos', 'supports', 'completed', 'toposes', 'inverse limit construction'

- Text: This paper studies the homomorphism of rings of continuous functions $\rho : C(X)\to C(Y)$, Y a subspace of a Tychonoff space X, induced by restriction
- Concepts: 'homomorphism', 'rings of continuous functions', 'subspace', 'Tychonoff space', 'induced', 'restriction'

- Text: We ask when ρ is an epimorphism in the categorical sense
- Concepts: categorical sense', 'epimorphism'

- Text: There are several appropriate categories: we look at CR, all commutative rings, and R/N, all reduced commutative rings
- Concepts: 'categories', 'commutative rings', 'reduced commutative rings'

- Text: When X is first countable and perfectly normal (e.g., a metric space), ρ is a CR -epimorphism if and only if it is a R/N-epimorphism if and only if Y is locally closed in X
- Concepts: countable, perfectly normal, metric space, CR-epimorphism, R/N-epimorphism, locally closed

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- Text: It is also shown that the restriction of ρ to $C^*(X)\to C^*(Y)$, when X is normal, is a CR-epimorphism if and only if it is a surjection. In general spaces the picture is more complicated, as is shown by various examples

- Concepts: C^*, normal, CR-epimorphism, surjection

- Text: Information about $Spec \rho$ and $Spec \rho$ restricted to the proconstructible set of prime z-ideals is given.
- Concepts: 'Spec', 'proconstructible set', 'prime z-ideals'

- Text: Generalizing the fact that Scott's continuous lattices form the equational hull of the class of all algebraic lattices, we describe an equational hull of LFP, the category of locally finitely presentable categories, over CAT
- Concepts: 'lattices', 'continuous lattices', 'algebraic lattices', 'equational hull', 'locally finitely presentable categories', 'CAT'

- Text: Up to a set-theoretical hypothesis this hull is formed by the category of all precontinuous categories, i.e., categories in which limits and filtered colimits distribute
- Concepts: 'category', 'precontinuous categories', 'limits', 'filtered colimits'

- Text: This concept is closely related to the continuous categories of P
- Concepts: 'continuous categories'

- Text: T
- Concepts: There are no math concepts mentioned in the given context. More information is needed to identify relevant words.

- Text: Johnstone and A

- Concepts: None provided as there is no Math-related content in the given Context.

- Text: Joyal.
- Concepts: None. The context only mentions a name and does not refer to any specific math concepts.

- Text: The homotopy classification of graded categorical groups and their homomorphisms is applied, in this paper, to obtain appropriate treatments for diverse crossed product constructions with operators which appear in several algebraic contexts
- Concepts: 'homotopy classification', 'graded categorical groups', 'homomorphisms', 'crossed product constructions'

- Text: Precise classification theorems are therefore stated for equivariant extensions by groups either of monoids, or groups, or rings, or rings-groups or algebras as well as for graded Clifford systems with operators, equivariant Azumaya algebras over Galois extensions of commutative rings and for strongly graded bialgebras and Hopf algebras with operators
- Concepts: equivariant extensions, monoids, groups, rings, algebras, graded Clifford systems, operators, Azumaya algebras, Galois extensions, commutative rings, strongly graded bialgebras, Hopf algebras

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- Text: These specialized classifications follow from the theory of graded categorical groups after identifying, in each case, adequate systems of factor sets with graded monoidal functors to suitable graded categorical groups associated to the structure dealt with.

- Concepts: 'graded categorical groups', 'factor sets', 'graded monoidal functors'

- Text: We characterize pointed varieties of universal algebras in which $(A\times B)/A \approx B$, i.e
- Concepts: 'universal algebras', 'pointed varieties', 'isomorphism', 'quotient', 'product'

- Text: all product projections are normal epimorphisms. -->
- Concepts: 'product', 'projections', 'normal epimorphisms'

- Text: A notion of resolution for higher-dimensional categories is defined, by using polygraphs, and basic invariance theorems are proved.
- Concepts: 'higher-dimensional categories', 'resolution', 'polygraphs', 'invariance theorems'

- Text: Extended cubical sets (with connections and interchanges) are presheaves on a ground category, the extended cubical site K, corresponding to the (augmented) simplicial site, the category of finite ordinals
- Concepts: 'extended cubical sets', 'presheaves', 'ground category', 'extended cubical site', 'simplicial site', 'finite ordinals'

- Text: We prove here that K has characterisations similar to the classical ones for the simplicial analogue, by generators and relations, or by the existence of a universal symmetric cubical monoid; in fact, K is the classifying category of a monoidal algebraic theory of such monoids

- Concepts: 'characterisations', 'simplicial analogue', 'generators and relations', 'universal symmetric cubical monoid', 'classifying category', 'monoidal algebraic theory', 'monoids'

- Text: Analogous results are given for the restricted cubical site} I, of ordinary cubical sets (just faces and degeneracies) and for the intermediate site J (including connections)
- Concepts: cubical site, ordinary cubical sets, faces, degeneracies, intermediate site, connections

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- Text: We also consider briefly the reversible analogue, !K.
- Concepts: 'reversible', 'analogue', '!K'

- Text: Protomodular categories were introduced by the first author more than ten years ago
- Concepts: 'protomodular categories'

- Text: We show that a variety $\mathcal V$ of universal algebras is protomodular if and only if it has 0-ary terms $e_1, ..., e_n$, binary terms $t_1, ..., t_n$, and (n+1)-ary term t satisfying the identities $t(x,t_1(x,y), ...,t_n(x,y)) = y$ and $t_i(x,x) = e_i$ for each $i = 1, ..., n$.
- Concepts: 'universal algebras', 'protomodular', '0-ary terms', 'binary terms', '(n+1)-ary term', 'identities'

- Text: One can associate to any strict globular ω-category three augmented simplicial nerves called the globular nerve, the branching and the merging semi-cubical nerves
- Concepts: 'globular ω-category', 'augmented simplicial nerves', 'globular nerve', 'branching semi-cubical nerves', 'merging semi-cubical nerves'

- Text: If this strict globular ω-category is freely generated by a precubical set, then the corresponding homology theories contain different informations about the geometry of the higher dimensional automaton modeled by the precubical set
- Concepts: 'globular', 'ω-category', 'freely generated', 'precubical set', 'homology theories', 'geometry', 'higher dimensional automaton'

- Text: Adding inverses in this ω-category to any morphism of dimension greater than 2 and with respect to any composition laws of dimension greater than 1 does not change these homology theories
- Concepts: ω-category, inverses, morphism, dimension, composition laws, homology theories

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- Text: In such a framework, the globular nerve always satisfies the Kan condition
- Concepts: 'framework', 'globular nerve', 'Kan condition'

- Text: On the other hand, both branching and merging nerves never satisfy it, except in some very particular and uninteresting situations
- Concepts: 'branching nerves', 'merging nerves'

- Text: In this paper, we introduce two new nerves (the branching and merging semi-globular nerves) satisfying the Kan condition and having conjecturally the same simplicial homology as the branching and merging semi-cubical nerves respectively in such framework
- Concepts: 'simplicial homology', 'nerves', 'semi-globular nerves', 'Kan condition', 'semi-cubical nerves'

- Text: The latter conjecture is related to the thin elements conjecture already introduced in our previous papers.
- Concepts: 'thin elements conjecture'

- Text: We show how the formal Wirthmuller isomorphism theorem simplifies the proof of the Wirthmuller isomorphism in equivariant stable homotopy theory
- Concepts: 'formal Wirthmuller isomorphism theorem', 'Wirthmuller isomorphism', 'equivariant', 'stable homotopy theory'

- Text: Other examples from equivariant stable homotopy theory show that the hypotheses of the formal Wirthmuller and formal Grothendieck isomorphism theorems cannot be weakened.
- Concepts: 'equivariant', 'homotopy theory', 'formal Wirthmuller theorem', 'formal Grothendieck theorem', 'isomorphism theorems'

- Text: There are many contexts in algebraic geometry, algebraic topology, and homological algebra where one encounters a functor that has both a left and right adjoint, with the right adjoint being isomorphic to a shift of the left adjoint specified by an appropriate `dualizing object'
- Concepts: 'algebraic geometry', 'algebraic topology', 'homological algebra', 'functor', 'left adjoint', 'right adjoint', 'dualizing object', 'shift'

- Text: Typically the left adjoint is well understood while the right adjoint is more mysterious, and the result identifies the right adjoint in familiar terms
- Concepts: 'left adjoint', 'right adjoint'

- Text: We give a categorical discussion of such results
- Concepts: 'categorical discussion', 'results'

- Text: One essential point is to differentiate between the classical framework that arises in algebraic geometry and a deceptively similar, but genuinely different, framework that arises in algebraic topology
- Concepts: 'algebraic geometry', 'framework', 'deceptively similar', 'genuinely different', 'algebraic topology'

- Text: Another is to make clear which parts of the proofs of such results are formal
- Concepts: proofs', 'formal results'

- Text: The analysis significantly simplifies the proofs of particular cases, as we illustrate in a sequel discussing applications to equivariant stable homotopy theory.
- Concepts: 'analysis', 'proofs', 'particular cases', 'applications', 'equivariant stable homotopy theory'

- Text: Linear bicategories are a generalization of ordinary bicategories in which there are two horizontal (1-cell) compositions corresponding to the ``tensor'' and ``par'' of linear logic
- Concepts: 'linear bicategories', 'ordinary bicategories', 'horizontal composition', '1-cell', 'tensor', 'par', 'linear logic'

- Text: Benabou's notion of a morphism (lax 2-functor) of bicategories may be generalized to linear bicategories, where they are called linear functors
- Concepts: 'morphism', 'lax 2-functor', 'bicategories', 'linear bicategories', 'linear functors'

- Text: Unfortunately, as for the bicategorical case, it is not obvious how to organize linear functors smoothly into a higher dimensional structure
- Concepts: bicategorical case', 'linear functors', 'higher dimensional structure'

- Text: Not only do linear functors seem to lack the two compositions expected for a linear bicategory but, even worse, they inherit from the bicategorical level the failure to combine well with the obvious notion of transformation

- Concepts: 'linear functor', 'linear bicategory', 'compositions', 'transformation'

- Text: As we shall see, there are also problems with lifting the notion of lax transformation to the linear setting. One possible resolution is to step up one dimension, taking morphisms as the 0-cell level
- Concepts: 'lax transformation', 'linear setting', 'dimension', 'morphisms', '0-cell level'

- Text: In the linear setting, this suggests making linear functors 0-cells, but what structure should sit above them? Lax transformations in a suitable sense just do not seem to work very well for this purpose (Section \ref{S:linnattran})
- Concepts: 'linear', 'functors', '0-cells', 'structure', 'lax transformations', 'suitable sense'

- Text: Modules provide a more promising direction, but raise a number of technical issues concerning the composability of both the modules and their transformations
- Concepts: Modules, composability, transformations

- Text: In general the required composites will not exist in either the linear bicategorical or ordinary bicategorical setting
- Concepts: 'composites', 'linear bicategorical', 'ordinary bicategorical'

- Text: However, when these composites do exist modules between linear functors do combine to form a linear bicategory
- Concepts: 'linear functors', 'modules', 'linear bicategory'

- Text: In order to better understand the conditions for the existence of composites, we have found it convenient, particularly in the linear setting, to develop the theory of ``poly-bicategories''
- Concepts: 'composites', 'linear setting', 'poly-bicategories', 'theory'

- Text: In this setting we can develop the theory so as to extract the answers to these problems not only for linear bicategories but also for ordinary bicategories
- Concepts: 'linear bicategories', 'ordinary bicategories', 'theory', 'problems'

- Text: Poly-bicategories are 2-dimensional generalizations of Szabo's poly-categories, consisting of objects, 1-cells, and poly-2-cells
- Concepts: 'poly-bicategories', '2-dimensional', 'generalizations', 'poly-categories', 'objects', '1-cells', 'poly-2-cells'

- Text: The latter may have several 1-cells as input and as output and can be composed by means of cutting along a single 1-cell
- Concepts: '1-cells', 'composed', 'cutting'

- Text: While a poly-bicategory does not require that there be any compositions for the 1-cells, such composites are determined (up to 1-cell isomorphism) by their universal properties

- Concepts: 'poly-bicategory', 'compositions', '1-cells', '1-cell isomorphism', 'universal properties'

- Text: We say a poly-bicategory is representable when there is a representing 1-cell for each of the two possible 1-cell compositions geared towards the domains and codomains of the poly 2-cells
- Concepts: 'poly-bicategory', 'representable', 'representing 1-cell', '1-cell compositions', 'domains', 'codomains', 'poly 2-cells'

- Text: In this case we recover the notion of a linear bicategory
- Concepts: 'linear bicategory'

- Text: The poly notions of functors, modules and their transformations are introduced as well
- Concepts: 'functors', 'modules', 'transformations'

- Text: The poly-functors between two given poly-bicategories P and P' together with poly-modules between poly-functors and their transformations form a new poly-bicategory provided P is representable and closed in the sense that every 1-cell has both a left and a right adjoint (in the appropriate linear sense)
- Concepts: 'poly-functors', 'poly-bicategories', 'poly-modules', 'transformations', 'representable', 'left adjoint', 'right adjoint'

- Text: Finally we revisit the notion of linear (or lax) natural transformations, which can only be defined for representable poly-bicategories

- Concepts: 'linear natural transformation', 'lax natural transformation', 'representable poly-bicategories'

- Text: These in fact correspond to modules having special properties.
- Concepts: 'modules', 'special properties'

- Text: In many applications of quasigroups isotopies and homotopies are more important than isomorphisms and homomorphisms
- Concepts: 'quasigroups', 'isotopies', 'homotopies', 'isomorphisms', 'homomorphisms'

- Text: In this paper, the way homotopies may arise in the context of categorical quasigroup model theory is investigated
- Concepts: 'homotopies', 'categorical', 'quasigroup', 'model theory'

- Text: In this context, the algebraic structures are specified by diagram-based logics, such as sketches, and categories of models become functor categories
- Concepts: 'algebraic structures', 'diagram-based logics', 'sketches', 'categories', 'models', 'functor categories'

- Text: An idea, pioneered by Gvaramiya and Plotkin, is used to give a construction of a model category naturally equivalent to the category of quasigroups with homotopies between them.

- Concepts: 'idea', 'construction', 'model category', 'category', 'quasigroups', 'homotopies'

- Text: A 2-group is a `categorified' version of a group, in which the underlying set G has been replaced by a category and the multiplication map m ; G x G -> G has been replaced by a functor
- Concepts: '2-group', 'categorified', 'group', 'category', 'multiplication map', 'functor'

- Text: Various versions of this notion have already been explored; our goal here is to provide a detailed introduction to two, which we call `weak' and `coherent' 2-groups
- Concepts: 'notion', 'introduction', 'weak 2-group', 'coherent 2-group'

- Text: A weak 2-group is a weak monoidal category in which every morphism has an inverse and every object x has a `weak inverse': an object y such that x \tensor y \iso 1 \iso y \tensor x
- Concepts: 'weak 2-group', 'weak monoidal category', 'morphism', 'inverse', 'object', 'tensor', 'iso'

- Text: A coherent 2-group is a weak 2-group in which every object x is equipped with a specified weak inverse x' and isomorphisms i_x : 1 -> x \tensor x', e_x : x' \tensor x -> 1 forming an adjunction
- Concepts: 'coherent 2-group', 'weak 2-group', 'object', 'weak inverse', 'isomorphisms', 'adjunction'

- Text: We describe 2-categories of weak and coherent 2-groups and an `improvement' 2-functor that turns weak 2-groups into coherent ones, and prove that this 2-functor is a 2-equivalence of 2-categories
- Concepts: '2-categories', 'coherent 2-groups', 'weak 2-groups', '2-functor', '2-equivalence'

- Text: We internalize the concept of coherent 2-group, which gives a quick way to define Lie 2-groups
- Concepts: 'coherent 2-group', 'Lie 2-groups'

- Text: We give a tour of examples, including the `fundamental 2-group' of a space and various Lie 2-groups
- Concepts: '2-group', 'fundamental 2-group', 'Lie 2-groups'

- Text: We also explain how coherent 2-groups can be classified in terms of 3rd cohomology classes in group cohomology
- Concepts: 'coherent 2-groups', 'classified', '3rd cohomology classes', 'group cohomology'

- Text: Finally, using this classification, we construct for any connected and simply-connected compact simple Lie group G a family of 2-groups G_h (h in Z) having G as its group of objects and U(1) as the group of automorphisms of its identity object
- Concepts: 'compact', 'simple Lie group', 'connected', 'simply-connected', 'group', 'objects', 'automorphisms', 'identity object'

- Text: These 2-groups are built using Chern-Simons theory, and are closely related to the Lie 2-algebras g_h (h in R) described in a companion paper.
- Concepts: '2-groups', 'Chern-Simons theory', 'Lie 2-algebras'

- Text: The theory of Lie algebras can be categorified starting from a new notion of `2-vector space', which we define as an internal category in Vect
- Concepts: Lie algebras, categorified, 2-vector space, internal category, Vect

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- Text: There is a 2-category 2Vect having these 2-vector spaces as objects, `linear functors' as morphisms and `linear natural transformations' as 2-morphisms
- Concepts: '2-category', '2Vect', '2-vector spaces', 'linear functors', 'morphisms', 'linear natural transformations', '2-morphisms'

- Text: We define a `semistrict Lie 2-algebra' to be a 2-vector space L equipped with a skew-symmetric bilinear functor [
- Concepts: 'semistrict Lie 2-algebra', '2-vector space', 'skew-symmetric bilinear functor'

- Text: ,
- Concepts: None provided. Please provide the context for the problem.

- Text:] : L x L -> L satisfying the Jacobi identity up to a completely antisymmetric trilinear natural transformation called the `Jacobiator', which in turn must satisfy a certain law of its own
- Concepts: 'Jacobi identity', 'antisymmetric', 'trilinear natural transformation', 'Jacobiator', 'law'

- Text: This law is closely related to the Zamolodchikov tetrahedron equation, and indeed we prove that any semistrict Lie 2-algebra gives a solution of this equation, just as any Lie algebra gives a solution of the Yang--Baxter equation
- Concepts: 'Law', 'Zamolodchikov tetrahedron equation', 'semistrict Lie 2-algebra', 'solution', 'Lie algebra', 'Yang-Baxter equation'

- Text: We construct a 2-category of semistrict Lie 2-algebras and prove that it is 2-equivalent to the 2-category of 2-term L_\infty-algebras in the sense of Stasheff
- Concepts: '2-category', 'semistrict Lie 2-algebras', '2-equivalent', '2-term L_\infty-algebras', 'Stasheff'

- Text: We also study strict and skeletal Lie 2-algebras, obtaining the former from strict Lie 2-groups and using the latter to classify Lie 2-algebras in terms of 3rd cohomology classes in Lie algebra cohomology
- Concepts: 'strict Lie 2-algebras', 'skeletal Lie 2-algebras', 'strict Lie 2-groups', 'classify', 'Lie 2-algebras', '3rd cohomology classes', 'Lie algebra cohomology'

- Text: This classification allows us to construct for any finite-dimensional Lie algebra g a canonical 1-parameter family of Lie 2-algebras g_h which reduces to g at h = 0
- Concepts: finite-dimensional Lie algebra, canonical, 1-parameter family, Lie 2-algebras

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- Text: These are closely related to the 2-groups G_h constructed in a companion paper.
- Concepts: '2-groups', 'companion paper'

- Text: If X is a locale, then its double powerlocale PX is defined to be PU(PL(X)) where PU and PL are the upper and lower powerlocale constructions
- Concepts: 'locale', 'double powerlocale', 'upper powerlocale', 'lower powerlocale', 'construction'

- Text: We prove various results relating it to exponentiation of locales, including the following
- Concepts: 'exponentiation', 'locales'

- Text: First, if X is a locale for which the exponential S^X exists (where S is the Sierpinski locale), then PX is an exponential S^(S^X)
- Concepts: locale, exponential, Sierpinski locale

- Text: Second, if in addition W is a locale for which PW is homeomorphic to S^X, then X is an exponential S^W. The work uses geometric reasoning, i.e

- Concepts: locale, homeomorphic, exponential

- Text: reasoning stable under pullback along geometric morphisms, and this enables the locales to be discussed in terms of their points as though they were spaces
- Concepts: 'reasoning', 'stable', 'pullback', 'geometric morphisms', 'locales', 'points', 'spaces'

- Text: It relies on a number of geometricity results including those for locale presentations and for powerlocales.
- Concepts: 'geometricity', 'locale presentations', 'powerlocales'

- Text: Adamek and Sousa recently solved the problem of characterizing the subcategories K of a locally λ-presentable category C which are λ-orthogonal in C, using their concept of Kλ-pure morphism
- Concepts: 'locally λ-presentable', 'λ-orthogonal', 'Kλ-pure morphism', 'subcategories'

- Text: We strengthen the latter definition, in order to obtain a characterization of the classes defined by orthogonality with respect to λ-presentable morphisms (where $f : A \rightarrow B is called λ-presentable if it is a λ-presentable object of the comma category A/C)
- Concepts: λ-presentable, morphisms, object, comma category

- Text: Those classes are natural examples of reflective subcategories defined by proper classes of morphisms
- Concepts: 'reflective subcategories', 'proper classes of morphisms'

- Text: Adamek and Sousa's result follows from ours
- Concepts: Nothing applicable for math concepts

- Text: We also prove that λ-presentable morphisms are precisely the pushouts of morphisms between λ-presentable objects of C.
- Concepts: λ-presentable morphisms, pushouts, λ-presentable objects

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- Text: The paper develops the previously proposed approach to constructing factorization systems in general categories
- Concepts: 'approach', 'constructing factorization systems', 'general categories'

- Text: This approach is applied to the problem of finding conditions under which a functor (not necessarily admitting a right adjoint) `reflects' factorization systems
- Concepts: 'functor', 'right adjoint', 'reflects', 'factorization systems'

- Text: In particular, a generalization of the well-known Cassidy-Héebert-Kelly factorization theorem is given
- Concepts: 'generalization', 'Cassidy-Héebert-Kelly', 'factorization theorem'

- Text: The problem of relating a factorization system to a pointed endofunctor is considered
- Concepts: 'factorization system', 'pointed endofunctor'

- Text: Some relevant examples in concrete categories are given.
- Concepts: concrete categories

- Text: Lyubashenko has described enriched 2-categories as categories enriched over V-Cat, the 2-category of categories enriched over a symmetric monoidal V
- Concepts: 'enriched 2-categories', 'categories enriched', 'V-Cat', 'symmetric monoidal'

- Text: This construction is the strict analogue for V-functors in V-Cat of Brian Day's probicategories for V-modules in V-Mod
- Concepts: 'V-functors', 'V-Cat', 'probicategories', 'V-modules', 'V-Mod'

- Text: Here I generalize the strict version to enriched n-categories for k-fold monoidal V
- Concepts: 'enriched n-categories', 'k-fold monoidal', 'V'

- Text: The latter is defined as by Balteanu, Fiedorowicz, Schwanzl and Vogt but with the addition of making visible the coherent associators
- Concepts: 'coherent associators'

- Text: The symmetric case can easily be recovered

- Concepts: 'symmetric case'

- Text: This paper proposes a recursive definition of V-n-categories and their morphisms
- Concepts: 'recursive definition', 'n-categories', 'morphisms'

- Text: We show that for V k-fold monoidal the structure of a (k-n)-fold monoidal strict (n+1)-category is possessed by V-n-Cat
- Concepts: 'k-fold monoidal', '(k-n)-fold monoidal', 'strict (n+1)-category', 'V-n-Cat'

- Text: This article is a completion of the work begun by the author in the preprint entitled Higher dimensional enrichment (math.CT/0306086), and the initial sections duplicate the beginning of that paper.
- Concepts: 'higher dimensional enrichment', 'preprint', 'math.CT', 'initial sections'

- Text: We investigate categorical versions of algebraically closed (= pure) embeddings, existentially closed embeddings, and the like, in the context of locally presentable categories
- Concepts: 'categorical', 'algebraically closed', 'pure', 'embeddings', 'existentially closed', 'locally presentable categories'

- Text: The definitions of S
- Concepts: There is no specified context in the problem. Please provide more information.

- Text: Fakir, as well as some of his results, are revisited and extended
- Concepts: None - there are no math concepts mentioned in this context.

- Text: Related preservation theorems are obtained, and a new proof of the main result of Rosicky, Adamek and Borceux, characterizing λ-injectivity classes in locally λ-presentable categories, is given.
- Concepts: 'preservation theorems', 'proof', 'characterizing', 'λ-injectivity classes', 'locally λ-presentable categories'

- Text: Following Ghilardi and Meloni, a relational variable set on a category B is a lax functor B to Rel, where Rel is the category of sets and relations
- Concepts: 'relational variable set', 'category', 'lax functor', 'Rel', 'sets', 'relations'

- Text: Change-of-base functors and their adjoints are considered for certain categories of relational variable sets and applied to construct the simplification of a dynamic set (in the sense of Stell).
- Concepts: change-of-base functors, adjoints, categories, relational variable sets, simplification, dynamic set, Stell

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- Text: In 1970, M

- Concepts: None (there are no math concepts mentioned in the context given)

- Text: Gerstenhaber introduced a list of axioms defining Moore categories in order to develop the Baer Extension Theory
- Concepts: 'axioms', 'Moore categories', 'Baer Extension Theory'

- Text: In this paper, we study some implications between the axioms and compare them with more recent notions, showing that, apart from size restrictions, a Moore category is a pointed, strongly protomodular and Barr-exact category with cokernels.
- Concepts: 'axioms', 'Moore category', 'pointed category', 'strongly protomodular category', 'Barr-exact category', 'cokernels'

- Text: Completions of (small) categories under certain kinds of colimits and exactness conditions have been studied extensively in the literature
- Concepts: completions, small categories, colimits, exactness conditions, literature

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- Text: When the category that we complete is not left exact but has some weaker kind of limit for finite diagrams, the universal property of the completion is usually stated with respect to functors that enjoy a property reminiscent of flatness
- Concepts: category, left exact, limit, finite diagrams, universal property, completion, functors, flatness

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- Text: In this fashion notions like that of a left covering or a multilimit merging functor have appeared in the literature
- Concepts: left covering, multilimit merging functor

- Text: We show here that such notions coincide with flatness when the latter is interpreted relative to (the internal logic of) a site structure associated to the target category
- Concepts: 'flatness', 'internal logic', 'site structure', 'target category'

- Text: We exploit this in order to show that the left Kan extensions of such functors, along the inclusion of their domain into its completion, are left exact
- Concepts: 'left Kan extensions', 'domain', 'completion', 'left exact'

- Text: This gives in a very economical and uniform manner the universal property of such completions
- Concepts: 'universal property', 'completions'

- Text: Our result relies heavily on some unpublished work of A
- Concepts: mathematics concept not present in the given context

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- Text: Kock from 1989
- Concepts: None extracted, as the context alone does not provide enough information to extract math concepts.

- Text: We further apply this to give a pretopos completion process for small categories having a weak finite limit property.

- Concepts: 'pretopos completion', 'small category', 'weak finite limit property'

- Text: The purpose of this paper is to set up a theory of generalized operads and multicategories and to use it as a language in which to propose a definition of weak n-category
- Concepts: 'generalized operads', 'multicategories', 'language', 'definition', 'weak n-category'

- Text: Included is a full explanation of why the proposed definition of n-category is a reasonable one, and of what happens when n is less than or equal to 2
- Concepts: 'n-category', 'proposed definition', 'less than or equal to 2'

- Text: Generalized operads and multicategories play other parts in higher-dimensional algebra too, some of which are outlined here: for instance, they can be used to simplify the opetopic approach to n-categories expounded by Baez, Dolan and others, and are a natural language in which to discuss enrichment of categorical structures.
- Concepts: 'generalized operads', 'multicategories', 'higher-dimensional algebra', 'opetopic approach', 'n-categories', 'enrichment', 'categorical structures'

- Text: This paper displays an approach to the construction of the homotopy theory of simplicial sets and the corresponding equivalence with the homotopy theory of topological spaces which is based on simplicial approximation techniques

- Concepts: 'homotopy theory', 'simplicial sets', 'equivalence', 'topological spaces', 'simplicial approximation techniques'

- Text: The required simplicial approximation results for simplicial sets and their proofs are given in full
- Concepts: 'simplicial approximation', 'simplicial sets', 'proofs'

- Text: Subdivision behaves like a covering in the context of the techniques displayed here.
- Concepts: 'subdivision', 'covering', 'techniques'

- Text: This article treats the problem of deriving the reflector of a semi-abelian category $\cal A$ onto a Birkhoff subcategory $\cal B$ of $\cal A$
- Concepts: 'semi-abelian category', 'reflector', 'Birkhoff subcategory'

- Text: Basing ourselves on Carrasco, Cegarra and Grandjean's homology theory for crossed modules, we establish a connection between our theory of Baer invariants with a generalization---to semi-abelian categories---of Barr and Beck's cotriple homology theory
- Concepts: 'homology theory', 'crossed modules', 'Baer invariants', 'semi-abelian categories', 'cotriple homology theory', 'Barr and Beck'

- Text: This results in a semi-abelian version of Hopf's formula and the Stallings-Stammbach sequence from group homology.
- Concepts: 'semi-abelian', 'Hopf's formula', 'Stallings-Stammbach sequence', 'group homology'

- Text: Extending the work of Fröhlich, Lue and Furtado-Coelho, we consider the theory of Baer invariants in the context of semi-abelian categories
- Concepts: 'Fröhlich', 'Lue', 'Furtado-Coelho', 'Baer invariants', 'semi-abelian categories', 'theory'

- Text: Several exact sequences, relative to a subfunctor of the identity functor, are obtained
- Concepts: 'exact sequences', 'subfunctor', 'identity functor'

- Text: We consider a notion of commutator which, in the case of abelianization, corresponds to Smith's
- Concepts: 'commutator', 'abelianization', "Smith's"

- Text: The resulting notion of centrality fits into Janelidze and Kelly's theory of central extensions
- Concepts: 'notion of centrality', 'Janelidze and Kelly', 'theory', 'central extensions'

- Text: Finally we propose a notion of nilpotency, relative to a Birkhoff subcategory of a semi-abelian category.
- Concepts: 'nilpotency', 'Birkhoff subcategory', 'semi-abelian category'

- Text: It is shown that, for a finitely-complete category C with coequalizers of kernel pairs, if every product-regular epi is also stably-regular then there exist the reflections (R)Grphs(C) --> (R)Rel(C), from (reflexive) graphs into (reflexive) relations in C, and Cat(C) --> Preord(C), from categories into preorders in C
- Concepts: finitely-complete category', 'coequalizers of kernel pairs', 'product-regular epi', 'stably-regular', 'reflections', 'graphs', 'relations', 'categories', 'preorders'

- Text: Furthermore, such a sufficient condition ensures as well that these reflections do have stable units
- Concepts: 'sufficient condition', 'reflections', 'stable units'

- Text: This last property is equivalent to the existence of a monotone-light factorization system, provided there are sufficiently many effective descent morphisms with domain in the respective full subcategory
- Concepts: monotone-light factorization system', 'effective descent morphisms', 'full subcategory'

- Text: In this way, we have internalized the monotone-light factorization for small categories via preordered sets, associated with the reflection Cat --> Preord, which is now just the special case C = Set.
- Concepts: 'monotone-light factorization', 'small categories', 'preordered sets', 'reflection', 'C = Set', 'internalized'

- Text: Two notions, generic morphisms and parametric representations, useful for the analysis of endofunctors arising in enumerative combinatorics, higher dimensional category theory, and logic, are defined and examined
- Concepts: 'endofunctors', 'enumerative combinatorics', 'higher dimensional category theory', 'logic', 'generic morphisms', 'parametric representations'

- Text: Applications to the Batanin approach to higher category theory, Joyal species and operads are provided.
- Concepts: 'higher category theory', 'Batanin approach', 'Joyal species', 'operads'

- Text: The centre of a monoidal category is a braided monoidal category
- Concepts: 'monoidal category', 'centre', 'braided monoidal category'

- Text: Monoidal categories are monoidal objects (or pseudomonoids) in the monoidal bicategory of categories
- Concepts: 'monoidal category', 'monoidal object', 'pseudomonoid', 'monoidal bicategory', 'category'

- Text: This paper provides a universal construction in a braided monoidal bicategory that produces a braided monoidal object from any monoidal object
- Concepts: 'braided monoidal bicategory', 'braided monoidal object', 'monoidal object', 'universal construction'

- Text: Some properties and sufficient conditions for existence of the construction are examined.
- Concepts: 'properties', 'sufficient conditions', 'existence', 'construction'

- Text: In the early 1990's the authors proved that the full subcategory of `sup-lattices' determined by the constructively completely distributive (CCD) lattices is equivalent to the idempotent splitting completion of the bicategory of sets and relations
- Concepts: 'sup-lattices', 'constructively completely distributive lattices', 'idempotent splitting completion', 'bicategory', 'sets', 'relations'

- Text: Having many corollaries, this was an extremely useful result
- Concepts: 'corollaries', 'result'

- Text: Moreover, as the authors soon suspected, it specializes a much more general result. Let D be a monad on a category C in which idempotents split
- Concepts: 'monad', 'category', 'idempotents', 'split'

- Text: Write kar(C_D) for the idempotent splitting completion of the Kleisli category
- Concepts: 'idempotent splitting completion', 'Kleisli category'

- Text: Write spl(C^D) for the category whose objects are pairs ((L,s),t), where (L,s) is an object of the Eilenberg-Moore category for D, and t is a homomorphism that splits s, with spl(C^D)((((L,s),t),((L',s'),t'))=C^D((L,s)(L',s')). The main result is that kar(C_D) is isomorphic to spl(C^D)
- Concepts: category, objects, pairs, Eilenberg-Moore category, homomorphism, splits, isomorphic

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- Text: We also show how this implies the CCD lattice characterization theorem and consider a more general context.
- Concepts: 'CCD lattice', 'characterization theorem'

- Text: Some unsolved problems about the classifying topos for Boolean algebras, as well as about the axiomatic arithmetic of finite combinatorial toposes, are closely connected with some simple distinctions between finite automata.
- Concepts: 'classifying topos', 'Boolean algebras', 'axiomatic arithmetic', 'finite combinatorial toposes', 'finite automata'

- Text: We show that every small category enriched over Sl - the symmetric monoidal closed category of sup-lattices and sup-preserving morphisms - is Morita equivalent to an Sl-monoid
- Concepts: 'small category', 'enriched', 'symmetric monoidal closed category', 'sup-lattices', 'sup-preserving morphisms', 'Morita equivalent', 'Sl-monoid'

- Text: As a corollary, we obtain a result of Borceux and Vitale asserting that every separable Sl-category is Morita equivalent to a separable Sl-monoid.

- Concepts: corollary, result, Borceux, Vitale, separable Sl-category, Morita equivalent, separable Sl-monoid

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- Text: A PROP is a way of encoding structure borne by an object of a symmetric monoidal category
- Concepts: 'PROP', 'encoding structure', 'object', 'symmetric monoidal category'

- Text: We describe a notion of distributive law for PROPs, based on Beck's distributive laws for monads
- Concepts: distributive law', 'PROPs', 'Beck's distributive laws', 'monads'

- Text: A distributive law between PROPs allows them to be composed, and an algebra for the composite PROP consists of a single object with an algebra structure for each of the original PROPs, subject to compatibility conditions encoded by the distributive law
- Concepts: 'distributive law', 'PROP', 'composite PROP', 'algebra structure', 'compatibility conditions'

- Text: An example is the PROP for bialgebras, which is a composite of the PROP for coalgebras and that for algebras.
- Concepts: 'PRO', 'bialgebras', 'PROP', 'coalgebras', 'algebras'

- Text: We show, for a monad T, that coalgebra structures on a T-algebra can be described in terms of "braidings", provided that the monad is equipped with an invertible distributive law satisfying the Yang-Baxter equation.

- Concepts: monad, coalgebra, T-algebra, distributive law, Yang-Baxter equation, braidings

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- Text: Cubical sets have a directed homology, studied in a previous paper and consisting of preordered abelian groups, with a positive cone generated by the structural cubes
- Concepts: 'Cubical sets', 'directed homology', 'preordered abelian groups', 'positive cone', 'structural cubes'

- Text: By this additional information, cubical sets can provide a sort of `noncommutative topology', agreeing with some results of noncommutative geometry but lacking the metric aspects of C* -algebras
- Concepts: 'cubical sets', 'noncommutative topology', 'noncommutative geometry', 'C* -algebras'

- Text: Here, we make such similarity stricter by introducing normed cubical sets and their normed directed homology, formed of normed preordered abelian groups
- Concepts: 'normed cubical sets', 'normed directed homology', 'normed preordered abelian groups'

- Text: The normed cubical sets NC_\theta associated with `irrational' rotations have thus the same classification up to isomorphism as the well-known irrational rotation C* -algebras A_\theta.

- Concepts: 'normed cubical sets', 'irrational rotations', 'classification up to isomorphism', 'irrational rotation', 'C*-algebras'

- Text: We characterize semi-abelian monadic categories and their localizations
- Concepts: 'semi-abelian', 'monadic categories', 'localizations'

- Text: These results are then used to obtain a characterization of pointed protomodular quasimonadic categories, and in particular of protomodular quasivarieties.
- Concepts: 'pointed', 'protomodular', 'quasimonadic', 'categories', 'protomodular quasivarieties'

- Text: A pregroup is a partially ordered monoid in which every element has a left and a right adjoint
- Concepts: 'pregroup', 'partially ordered monoid', 'left adjoint', 'right adjoint'

- Text: The main result is that for some well-behaved subgroups of the group of diffeomorphisms of the real numbers, the set of all endofunctions of the integers that are asymptotic at $\pm\infty$ to (the restriction to the integers of) a function in the subgroup is a pregroup.
- Concepts: 'diffeomorphisms', 'real numbers', 'endofunctions', 'integers', 'asymptotic', 'subgroup', 'pregroup'

- Text: In this paper we introduce and study the categorical group of derivations, Der(G, A), from a categorical group G into a braided categorical group (A,c) equipped with a given coherent left action of G
- Concepts: 'categorical group', 'derivations', 'braided categorical group', 'coherent left action'

- Text: Categorical groups provide a 2-dimensional vision of groups and so this object is a sort of 0-cohomology at a higher level for categorical groups
- Concepts: 'categorical groups', '2-dimensional vision', 'groups', '0-cohomology', 'higher level'

- Text: We show that the functor Der(-, A) is corepresentable by the semidirect product of A with G and that Der(G,-) preserves homotopy kernels
- Concepts: functor, corepresentable, semidirect product, Der, homotopy kernels

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- Text: Well-known cohomology groups, and exact sequences relating these groups, in several different contexts are then obtained as examples of this general theory.
- Concepts: 'cohomology groups', 'exact sequences', 'general theory'

- Text: In this paper we construct extensions of Set-monads -- and, more generally, of lax Rel-monads -- into lax monads of the bicategory Mat(V) of generalized V-matrices, whenever V is a well-behaved lattice equipped with a tensor product

- Concepts: 'Set-monads', 'lax Rel-monads', 'lax monads', 'bicategory', 'generalized V-matrices', 'well-behaved lattice', 'tensor product'

- Text: We add some guiding examples.
- Concepts: 'guiding examples'

- Text: We show that strongly protomodular categories (as the category of groups for instance) provide an appropriate framework in which the commutator of two equivalence relations do coincide with the commutator of their associated normal subobjects, whereas it is not the case in any semi-abelian category.
- Concepts: protomodular categories, category of groups, commutator, equivalence relations, normal subobjects, semi-abelian category

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- Text: We generalize to an arbitrary variety the von Neumann axiom for a ring
- Concepts: 'arbitrary variety', 'von Neumann axiom', 'ring'

- Text: We study its implications on the purity of monomorphisms and the flatness of algebras.
- Concepts: 'purity', 'monomorphisms', 'flatness', 'algebras'

- Text: Brown representability approximates the homotopy category of spectra by means of cohomology functors defined on finite spectra

- Concepts: 'Brown representability', 'homotopy category', 'spectra', 'cohomology functors', 'finite spectra'

- Text: We will show that if a model category $\cal K$ is suitably determined by λ-small objects then its homotopy category $Ho(\cal K)$ is approximated by cohomology functors defined on those λ-small objects
- Concepts: model category, homotopy category, cohomology functors, λ-small objects

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- Text: In the case of simplicial sets, we have $\lambda = \omega_1$, i.e., λ-small means countable.
- Concepts: 'simplicial sets', 'λ', 'ω_1', 'countable'

- Text: For large signatures Σ we prove that Birkhoff's Variety Theorem holds (i.e., equationally presentable collections of Σ-algebras are precisely those closed under limits, subalgebras, and quotient algebras) iff the universe of small sets is not measurable
- Concepts: Birkhoff's Variety Theorem', 'equationally presentable', 'Σ-algebras', 'limits', 'subalgebras', 'quotient algebras', 'universe of small sets', 'measurable'

- Text: Under that limitation Birkhoff's Variety Theorem holds in fact for F-algebras of an arbitrary endofunctor F of the category Class of classes and functions. For endofunctors F of Set, the category of small sets, Jan Reiterman proved that if F

is a varietor (i.e., if free F-algebras exist) then Birkhoff's Variety Theorem holds for F-algebras

- Concepts: endofunctor, category, F-algebras, small sets, varietor, free F-algebras, Birkhoff's Variety Theorem

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- Text: We prove the converse, whenever F preserves preimages: if $F$is not a varietor, Birkhoff's Variety Theorem does not hold
- Concepts: 'preserve preimages', 'varietor', 'Birkhoff's Variety Theorem'

- Text: However, we also present a non-varietor satisfying Birkhoff's Variety Theorem
- Concepts: 'Birkhoff's Variety Theorem', 'non-varietor'

- Text: Our most surprising example is two varietors whose coproduct does not satisfy Birkhoff's Variety Theorem.
- Concepts: 'varietors', 'coproduct', "Birkhoff's Variety Theorem"

- Text: The paper is in essence a survey of categories having ϕ-weighted colimits for all the weights ϕ in some class Φ
- Concepts: 'categories', 'weighted colimits', 'weights', 'class'

- Text: We introduce the class Φ^+ of Φ-flat weights which are those ψ for which ψ-colimits commute in the base $\cal V$ with limits having weights in Φ; and the class Φ^- of Φ-atomic weights, which are those ψ for which ψ-limits commute in the base $\cal V$ with colimits having weights in Φ

- Concepts: 'class', 'weights', 'Φ-flat', 'ψ', 'colimits', 'commute', 'base', '$\cal V$', 'limits', 'Φ-atomic', 'limits', 'colimits'

- Text: We show that both these classes are saturated (that is, what was called closed in the terminology of Albert and Kelly)
- Concepts: 'saturated', 'closed'

- Text: We prove that for the class $\cal P$ of all weights, the classes $\cal P^+$ and $\cal P^-$ both coincide with the class $\Q$ of absolute weights
- Concepts: 'class', 'weights', '$\cal P$', '$\cal P^+$', '$\cal P^-$', '$\Q$', 'absolute weights'

- Text: For any class Φ and any category $\cal A$, we have the free Φ-cocompletion $\Phi(\cal A)$ of $\cal A$; and we recognize $\cal Q(\cal A)$ as the Cauchy-completion of $\cal A$
- Concepts: 'class', 'category', 'free', 'cocompletion', 'Cauchy-completion'

- Text: We study the equivalence between ${(\cal Q(\cal A^{op}))}^{op}$ and $\cal Q(\cal A)$, which we exhibit as the restriction of the Isbell adjunction between ${[\cal A,\cal V]}^{op}$ and $[\cal A^{op},\cal V]$ when $\cal A$ is small; and we give a new Morita theorem for any class Φ containing $\cal Q$

- Concepts: equivalence, restriction, adjunction, Isbell adjunction, class, Morita theorem

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- Text: We end with the study of Φ-continuous weights and their relation to the Φ-flat weights.
- Concepts: 'Φ-continuous', 'Φ-flat'

- Text: In order to apply nonstandard methods to modern algebraic geometry, as a first step in this paper we study the applications of nonstandard constructions to category theory
- Concepts: 'nonstandard methods', 'algebraic geometry', 'nonstandard constructions', 'category theory'

- Text: It turns out that many categorical properties are well behaved under enlargements.
- Concepts: 'categorical properties', 'enlargements'

- Text: Following Lawvere, a generalized metric space (gms) is a set X equipped with a metric map from X^{2} to the interval of upper reals (approximated from above but not from below) from 0 to ∞ inclusive, and satisfying the zero self-distance law and the triangle inequality. We describe a completion of gms's by Cauchy filters of formal balls
- Concepts: 'generalized metric space', 'metric map', 'X^{2}', 'interval of upper reals', 'zero self-distance law', 'triangle inequality', 'completion', 'Cauchy filters', 'formal balls'

- Text: In terms of Lawvere's approach using categories enriched over $[0,\infty]$, the Cauchy filters are equivalent to flat left modules. The completion generalizes the usual one for metric spaces
- Concepts: Lawvere's approach, categories enriched over $[0,\infty$, Cauchy filters, flat left modules, completion, metric spaces

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- Text: For quasimetrics it is equivalent to the Yoneda completion in its netwise form due to Kunzi and Schellekens and thereby gives a new and explicit characterization of the points of the Yoneda completion. Non-expansive functions between gms's lift to continuous maps between the completions. Various examples and constructions are given, including finite products. The completion is easily adapted to produce a locale, and that part of the work is constructively valid
- Concepts: 'quasimetrics', 'Yoneda completion', 'netwise form', 'Kunzi', 'Schellekens', 'non-expansive functions', 'continuous maps', 'finite products', 'locale', 'constructively valid'

- Text: The exposition illustrates the use of geometric logic to enable point-based reasoning for locales.
- Concepts: 'geometric logic', 'point-based reasoning', 'locales'

- Text: A precise concept of concrete geometrical category is introduced in an axiomatic way
- Concepts: 'concrete geometrical category', 'axiomatic'

- Text: To any algebra L for an many-sorted infinitary algebraic theory T is associated a concrete geometrical category Geo(L), the so-called classifying concrete geometrical category of L, satisfying a universal property
- Concepts: 'infinitary algebraic theory', 'algebra', 'sorted', 'concrete geometrical category', 'classifying concrete geometrical category', 'universal property'

- Text: The terminology "geometrical" is justified firstly for Geo(L) and secondly for any concrete geometrical category by proving that they are all classifying ones
- Concepts: 'geometrical', 'concrete geometrical category', 'classifying'

- Text: The legitimate category CGC of concrete geometrical categories is build up and proved to be the dual of the legitimate category TGC of topological geometrical categories.
- Concepts: 'category', 'concrete geometrical category', 'dual', 'topological geometrical category'

- Text: For every group G, we construct a functor F : SET --> SET (finitary for a finite group G) such that the monoid of all natural endotransformations of F is a group isomorphic to G.
- Concepts: 'group', 'functor', 'SET', 'natural endotransformations', 'monoid', 'isomorphic'

- Text: We consider a semi-abelian category V and we write Act(G,X) for the set of actions of the object G on the object X, in the sense of the theory of semi-direct products in V

- Concepts: 'semi-abelian category', 'actions', 'object', 'theory of semi-direct products'

- Text: We investigate the representability of the functor Act(-,X) in the case where V is locally presentable, with finite limits commuting with filtered colimits
- Concepts: 'functor', 'representability', 'locally presentable', 'finite limits', 'filtered colimits'

- Text: This contains all categories of models of a semi-abelian theory in a Grothendieck topos, thus in particular all semi-abelian varieties of universal algebra
- Concepts: 'semi-abelian theory', 'Grothendieck topos', 'semi-abelian varieties', 'universal algebra'

- Text: For such categories, we prove first that the representability of Act(-,X) reduces to the preservation of binary coproducts
- Concepts: 'categories', 'representability', 'Act', 'preservation', 'binary coproducts'

- Text: Next we give both a very simple necessary condition and a very simple sufficient condition, in terms of amalgamation properties, for the preservation of binary coproducts by the functor Act(-,X) in a general semi-abelian category
- Concepts: 'amalgamation properties', 'binary coproducts', 'functor', 'semi-abelian category'

- Text: Finally, we exhibit the precise form of the more involved ``if and only if'' amalgamation property corresponding to the representability of actions: this condition is in particular related to a new notion of ``normalization of a morphism''
- Concepts: 'amalgamation property', 'representability of actions', 'normalization of a morphism'

- Text: We provide also a wide supply of algebraic examples and counter-examples, giving in particular evidence of the relevance of the object representing Act(-,X), when it turns out to exist.
- Concepts: 'algebraic examples', 'counter-examples', 'object representing', 'Act(-,X)'

- Text: We generalize the Baues-Jibladze descent theorem to a large class of groupoid enriched categories.
- Concepts: 'groupoid enriched categories', 'Baues-Jibladze descent theorem'

- Text: The definition of a category of (T,V)-algebras, where V is a unital commutative quantale and T is a Set-monad, requires the existence of a certain lax extension of T
- Concepts: 'category', '(T,V)-algebras', 'commutative quantale', 'Set-monad', 'lax extension'

- Text: In this article, we present a general construction of such an extension
- Concepts: general construction', 'extension'

- Text: This leads to the formation of two categories of (T,V)-algebras: the category Alg(T,V) of canonical (T,V)-algebras, and the category Alg(T',V) of op-canonical (T,V)-algebras
- Concepts: category, (T,V)-algebras, Alg(T,V), Alg(T',V), canonical (T,V)-algebras, op-canonical (T,V)-algebras

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- Text: The usual topological-like examples of categories of (T,V)-algebras (preordered sets, topological, metric and approach spaces) are obtained in this way, and the category of closure spaces appears as a category of canonical (P,V)-algebras, where P is the powerset monad
- Concepts: categories, algebras, preordered sets, topological spaces, metric spaces, approach spaces, closure spaces, monad

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- Text: This unified presentation allows us to study how these categories are related, and it is shown that under suitable hypotheses both Alg(T,V) and Alg(T',V) embed coreflectively into Alg(P,V).
- Concepts: 'unified presentation', 'categories', 'Alg', 'coreflectively', 'embed'

- Text: This paper is the second in a series exploring the properties of a functor which assigns a homotopy double groupoid with connections to a Hausdorff space. We show that this functor satisfies a version of the van Kampen theorem, and so is a suitable tool for nonabelian, 2-dimensional, local-to-global problems

- Concepts: 'functor', 'homotopy double groupoid', 'connections', 'Hausdorff space', 'van Kampen theorem', 'nonabelian', '2-dimensional', 'local-to-global problems'

- Text: The methods are analogous to those developed by Brown and Higgins for similar theorems for other higher homotopy groupoids. An integral part of the proof is a detailed discussion of commutative cubes in a double category with connections, and a proof of the key result that any composition of commutative cubes is commutative
- Concepts: 'higher homotopy groupoids', 'Brown and Higgins', 'theorems', 'commutative cubes', 'double category', 'connections', 'composition', 'proof'

- Text: These results have recently been generalised to all dimensions by Philip Higgins.
- Concepts: 'dimensions', 'generalised'

- Text: A survey of parts of General Coalgebra is presented with applications to the theory of systems
- Concepts: 'general coalgebra', 'theory of systems'

- Text: Stress is laid on terminal coalgebras and coinduction as well as iterative algebras and iterative theories.
- Concepts: 'terminal coalgebras', 'coinduction', 'iterative algebras', 'iterative theories'

- Text: In the quest for an elegant formulation of the notion of ``polycategory'' we develop a more symmetric counterpart to Burroni's notion of ``T- category'', where T is a cartesian monad on a category X with pullbacks
- Concepts: 'polycategory', 'symmetric counterpart', 'Burroni's notion', 'T-category', 'cartesian monad', 'category X', 'pullbacks'

- Text: Our approach involves two such monads, S and T, that are linked by a suitable generalization of a distributive law in the sense of Beck
- Concepts: 'monads', 'Suitable generalization', 'distributive law', 'Beck'

- Text: This takes the form of a span omega : TS ST in the functor category [X,X] and guarantees essential associativity for a canonical pullback-induced composition of S-T-spans over X, identifying them as the 1-cells of a bicategory, whose (internal) monoids then qualify as ``omega-categories''
- Concepts: span, functor category, essential associativity, pullback-induced composition, S-T-spans, bicategory, internal monoids, omega-categories

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- Text: In case that S and T both are the free monoid monad on set, we construct an omega utilizing an apparently new classical distributive law linking the free semigroup monad with itself
- Concepts: 'monoid monad', 'free monoid monad', 'set', 'omega', 'distributive law', 'free semigroup monad'

- Text: Our construction then gives rise to so-called ``planar polycategories'', which nowadays seem to be of more intrinsic interest than Szabo's original polycategories
- Concepts: 'construction', 'planar polycategories', 'Szabo''s original polycategories'

- Text: Weakly cartesian monads on X may be accommodated as well by first quotienting the bicategory of X-spans.
- Concepts: 'weakly cartesian monads', 'bicategory', 'X-spans', 'quotienting'

- Text: We revise our `Physical Traces' paper in the light of the results in [Abramsky and Coecke LiCS`04]
- Concepts: 'Physical Traces', 'paper', 'results', 'Abramsky', 'Coecke', 'LiCS`04'

- Text: The key fact is that the notion of a strongly compact closed category allows abstract notions of adjoint, bipartite projector and inner product to be defined, and their key properties to be proved
- Concepts: 'strongly compact closed category', 'adjoint', 'bipartite projector', 'inner product', 'key properties'

- Text: In this paper we improve on the definition of strong compact closure as compared to the one presented in [Abramsky and Coecke LiCS`04]
- Concepts: 'strong compact closure', 'definition'

- Text: This modification enables an elegant characterization of strong compact closure in terms of adjoints and a Yanking axiom, and a better treatment of bipartite projectors.
- Concepts: 'characterization', 'strong compact closure', 'adjoints', 'Yanking axiom', 'bipartite projectors'

- Text: We give two related universal properties of the span construction
- Concepts: 'universal properties', 'span construction'

- Text: The first involves sinister morphisms out of the base category and sinister transformations
- Concepts: 'morphisms', 'transformations', 'base category'

- Text: The second involves oplax morphisms out of the bicategory of spans having an extra property; we call these `jointed' oplax morphisms.
- Concepts: 'op-lax morphisms', 'bicategory of spans', 'jointed oplax morphisms'

- Text: The relationships between thin elements, commutative shells and connections in cubical omega-categories are explored by a method which does not involve the use of pasting theory or nerves of omega-categories (both of which were previously needed for this purpose; see Al-Agl, Brown and Steiner, Section 9)
- Concepts: 'cubical omega-categories', 'thin elements', 'commutative shells', 'connections'

- Text: It is shown that composites of commutative shells are commutative and that thin structures are equivalent to appropriate sets of connections; this work extends to all dimensions the results proved in dimensions 2 and 3 in Brown, Kamps and Porter and Brown and Mosa.
- Concepts: 'composites', 'commutative', 'shells', 'thin structures', 'equivalent', 'sets', 'connections', 'dimensions', 'Brown', 'Kamps', 'Porter', 'Mosa'

- Text: Call-by-push-value is a "semantic machine code", providing a set of simple primitives from which both the call-by-value and call-by-name paradigms are built
- Concepts: 'call-by-push-value', 'semantic machine code', 'primitives', 'call-by-value', 'call-by-name'

- Text: We present its operational semantics as a stack machine, suggesting a term judgement of stacks
- Concepts: 'operational semantics', 'stack machine', 'term judgement', 'stacks'

- Text: We then see that CBPV, incorporating these stack terms, has a simple categorical semantics based on an adjunction between values and stacks
- Concepts: 'CBPV', 'stack terms', 'categorical semantics', 'adjunction', 'values', 'stacks'

- Text: There are no coherence requirements. We describe this semantics incrementally

- Concepts: coherence requirements', 'semantics'

- Text: First, we introduce locally indexed categories and the opGrothendieck construction, and use these to give the basic structure for interpreting the three judgements: values, stacks and computations
- Concepts: 'locally indexed categories', 'opGrothendieck construction', 'judgements', 'values', 'stacks', 'computations'

- Text: Then we look at the universal property required to interpret each type constructor
- Concepts: 'universal property', 'type constructor', 'interpret'

- Text: We define a model to be a strong adjunction with countable coproducts, countable products and exponentials. We see a wide range of instances of this structure: we give examples for divergence, storage, erratic choice, continuations, possible worlds and games (with or without a bracketing condition), in each case resolving the strong monad from the literature into a strong adjunction
- Concepts: 'strong adjunction', 'countable coproducts', 'countable products', 'exponentials', 'divergence', 'storage', 'erratic choice', 'continuations', 'possible worlds', 'games', 'strong monad'

- Text: And we give ways of constructing models from other models. Finally, we see that call-by-value and call-by-name are interpreted within the Kleisli and co-Kleisli parts, respectively, of a call-by-push-value adjunction.

- Concepts: construction, models, Kleisli, co-Kleisli, call-by-value, call-by-name, call-by-push-value adjunction

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- Text: Call two maps, f,g from C to C', of chain complexes absolutely homologous if for any additive functor F, the induced Ff and Fg are homologous (induce the same map on homology)
- Concepts: 'chain complexes', 'additive functor', 'homology'

- Text: It is known that the identity is absolutely homologous to 0 iff it is homotopic to 0 and tempting to conjecture that f and g are absolutely homologous iff they are homotopic
- Concepts: identity', 'homologous', 'homotopic', 'conjecture'

- Text: This conjecture is false, but there is an equational characterization of absolute homology
- Concepts: 'conjecture', 'equational characterization', 'absolute homology'

- Text: I also characterize left absolute and right absolute (in which F is quantified over left or right exact functors).
- Concepts: 'left absolute', 'right absolute', 'quantified', 'left exact functor', 'right exact functor'

- Text: We thoroughly treat several familiar and less familiar definitions and results concerning categories, functors and distributors enriched in a base quantaloid Q
- Concepts: 'categories', 'functors', 'distributors', 'enriched', 'base quantaloid'

- Text: In analogy with V-category theory we discuss such things as adjoint functors, (pointwise) left Kan extensions, weighted (co)limits, presheaves and free (co)completion, Cauchy completion and Morita equivalence
- Concepts: V-category, adjoint functors, left Kan extensions, weighted limits, presheaves, free completion, Cauchy completion, Morita equivalence

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- Text: With an appendix on the universality of the quantaloid Dist(Q) of Q-enriched categories and distributors.
- Concepts: 'appendix', 'universality', 'quantaloid', 'Q-enriched categories', 'distributors'

- Text: We recall and reformulate certain known constructions, in order to make a convenient setting for obtaining generalized monotone-light factorizations in the sense of A
- Concepts: 'constructions', 'generalized', 'monotone-light factorizations'

- Text: Carboni, G
- Concepts: None. The context only mentions a name.

- Text: Janelidze, G
- Concepts: Sorry, the context provided for this problem seems to be incomplete or missing. Can you please provide a complete context so I can extract the words that denote Math concepts?

- Text: M

- Concepts: There are no math concepts mentioned in the given context "M".

- Text: Kelly and R
- Concepts: None provided in the context

- Text: Paré
- Concepts: There is not enough information in the given context to extract any math concepts. The word "Paré" does not have any mathematical meaning or context.

- Text: This setting is used to study the existence of monotone-light factorizations both in categories of simplicial objects and in categories of internal categories
- Concepts: monotone-light factorizations, categories, simplicial objects, internal categories

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- Text: It is shown that there is a non-trivial monotone-light factorization for simplicial sets, such that the monotone-light factorization for reflexive graphs via reflexive relations is a special case of it, obtained by truncation
- Concepts: 'monotone-light factorization', 'simplicial sets', 'reflexive graphs', 'reflexive relations', 'truncation'

- Text: More generally, we will show that there exists a monotone-light factorization associated with every full subcategory Mono(F_n), n >= 0, consisting of all simplicial sets whose unit morphisms are monic for the localization

$F_n:\mathbf{Set}^{\Delta^{op}}\rightarrow\mathbf{Set}^{\Delta^{op}_n
which truncates each simplicial set after the object of n-simplices

- Concepts: 'simplicial set', 'unit morphisms', 'monic', 'localization', 'truncates', 'n-simplices'

- Text: The monotone-light factorization for categories via preorders is as well derived from the proposed setting
- Concepts: 'monotone-light factorization', 'preorders', 'categories'

- Text: We also show that, for regular Mal'cev categories, the reflection of internal groupoids into internal equivalence relations necessarily produces monotone-light factorizations
- Concepts: 'regular Mal'cev categories', 'internal groupoids', 'internal equivalence relations', 'monotone-light factorizations'

- Text: It turns out that all these reflections do have stable units, in the sense of C
- Concepts: 'stable units', 'C'

- Text: Cassidy, M
- Concepts: No math concepts are given in the context provided.

- Text: Hébert and G
- Concepts: None, as the context does not provide any information related to Math concepts.

- Text: M

- Concepts: No concepts can be extracted from this context as it only contains one letter.

- Text: Kelly, giving rise to Galois theories.
- Concepts: 'Galois theories'

- Text: Storrer introduced the epimorphic hull of a commutative semiprime ring R and showed that it is (up to isomorphism) the unique essential epic von Neumann regular extension of R
- Concepts: 'commutative semiprime ring', 'epimorphic hull', 'von Neumann regular extension', 'essential epic'

- Text: In the case when R = C(X) with X a Tychonoff space, we show that the embedding induced by a dense subspace of X is always essential
- Concepts: 'Tychonoff space', 'embedding', 'dense subspace', 'essential'

- Text: This simplifies the search for spaces whose epimorphic hull is a full ring of continuous functions, and allows us to obtain new examples where this occurs
- Concepts: 'epimorphic hull', 'full ring of continuous functions'

- Text: The main theorem comes close to a characterisation of this phenomenon.
- Concepts: characterisation, phenomenon

- Text: We show that the generic symmetric monoidal category with a commutative separable algebra which has a Σ-family of actions is the category of cospans of finite Σ-labelled graphs restricted to finite sets as objects, thus providing a syntax for automata on the alphabet Σ
- Concepts: symmetric monoidal category, commutative separable algebra, Σ-family, cospans, finite Σ-labelled graphs, syntax, automata

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- Text: We use this result to produce semantic functors for Σ-automata.
- Concepts: 'semantic functors', 'Σ-automata'

- Text: This work is a contribution to a recent field, Directed Algebraic Topology
- Concepts: 'Directed Algebraic Topology'

- Text: Categories which appear as fundamental categories of `directed structures', e.g
- Concepts: 'categories', 'directed structures', 'fundamental categories'

- Text: ordered topological spaces, have to be studied up to appropriate notions of directed homotopy equivalence, which are more general than ordinary equivalence of categories
- Concepts: 'ordered topological spaces', 'directed homotopy equivalence', 'equivalence of categories'

- Text: Here we introduce past and future equivalences of categories - sort of symmetric versions of an adjunction - and use them and their combinations to get `directed models' of a category; in the simplest case, these are the join of the least full reflective and the least full coreflective subcategory.
- Concepts: categories, adjunction, directed models, full reflective subcategory, full coreflective subcategory

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- Text: This paper constructs models of intuitionistic set theory in suitable categories
- Concepts: 'intuitionistic set theory', 'models', 'categories'

- Text: First, a Basic Intuitionistic Set Theory (BIST) is stated, and the categorical semantics are given
- Concepts: 'Intuitionistic Set Theory', 'Categorical Semantics'

- Text: Second, we give a notion of an ideal over a category, using which one can build a model of BIST in which a given topos occurs as the sets
- Concepts: 'ideal', 'category', 'model', 'BIST', 'topos', 'sets'

- Text: And third, a sheaf model is given of a Basic Intuitionistic Class Theory conservatively extending BIST
- Concepts: 'sheaf model', 'Basic Intuitionistic Class Theory', 'conservatively extending'

- Text: The paper extends the results in Awodey, Butz, Simpson and Streicher (2003) by introducing a new and perhaps more natural notion of ideal, and in the class theory of part three.

- Concepts: 'class theory', 'ideal', 'natural notion'

- Text: The aim of this paper is to describe Quillen model category structures on the category CatC of internal categories and functors in a given finitely complete category C
- Concepts: 'paper', 'Quillen model category', 'category', 'internal categories', 'functors', 'finitely complete category'

- Text: Several non-equivalent notions of internal equivalence exist; to capture these notions, the model structures are defined relative to a given Grothendieck topology on C. Under mild conditions on C, the regular epimorphism topology determines a model structure where we is the class of weak equivalences of internal categories (in the sense of Bunge and Pare)
- Concepts: 'internal equivalence', 'model structures', 'Grothendieck topology', 'regular epimorphism topology', 'weak equivalences', 'internal categories', 'Bunge and Pare'

- Text: For a Grothendieck topos C we get a structure that, though different from Joyal and Tierney's, has an equivalent homotopy category
- Concepts: 'Grothendieck topos', 'structure', 'homotopy category'

- Text: In case C is semi-abelian, these weak equivalences turn out to be homology isomorphisms, and the model structure on CatC induces a notion of homotopy of internal crossed modules

- Concepts: semi-abelian, weak equivalences, homology isomorphisms, model structure, CatC, homotopy, internal crossed modules

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- Text: In case C is the category Gp of groups and homomorphisms, it reduces to the case of crossed modules of groups. The trivial topology on a category C determines a model structure on CatC where we is the class of strong equivalences (homotopy equivalences), fib the class of internal functors with the homotopy lifting property, and cof the class of functors with the homotopy extension property
- Concepts: 'category', 'groups', 'homomorphisms', 'crossed modules', 'topology', 'model structure', 'strong equivalences', 'homotopy equivalences', 'internal functors', 'homotopy lifting property', 'functors', 'homotopy extension property'

- Text: As a special case, the ``folk'' Quillen model category structure on the category Cat = CatSet of small categories is recovered.
- Concepts: 'Quillen model category', 'category', 'small categories'

- Text: It is well known that for any monad, the associated Kleisli category is embedded in the category of Eilenberg-Moore algebras as the free ones
- Concepts: 'monad', 'Kleisli category', 'embedded', 'category', 'Eilenberg-Moore algebras', 'free ones'

- Text: We discovered some interesting examples in which this embedding is reflective; that is, it has a left adjoint
- Concepts: 'embedding', 'reflective', 'left adjoint'

- Text: To understand this phenomenon we introduce and study a class of monads arising from factorization systems, and thereby termed factorization monads
- Concepts: monads, factorization systems, factorization monads

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- Text: For them we show that under some simple conditions on the factorization system the free algebras are a full reflective subcategory of the algebras
- Concepts: 'factorization system', 'free algebras', 'reflective subcategory', 'algebras'

- Text: We provide various examples of this situation of a combinatorial nature.
- Concepts: combinatorial

- Text: A generating family, in a category C is a collection of objects $\{A_i|i\in I\}$ such that if for any subobject Y >--> X, every $f: A_i \rightarrow X$ factors through m, then m is an isomorphism - i.e
- Concepts: 'generating family', 'category', 'objects', 'subobject', 'isomorphism', 'factor'

- Text: the functors $C(A_i, -)$ are collectively conservative
- Concepts: functors', 'conservative'

- Text: In this paper, we examine some circumstances under which subobjects of 1 form a generating family
- Concepts: 'generating family', 'subobjects', '1'

- Text: Objects for which subobjects of 1 do form a generating family are called partially well-pointed
- Concepts: 'subobjects', 'generating family', 'partially well-pointed'

- Text: For a Grothendieck topos, it is well known that subobjects of 1 form a generating family if and only if the topos is localic
- Concepts: 'Grothendieck topos', 'subobjects', 'generating family', 'localic'

- Text: For the elementary case, little more is known
- Concepts: 'elementary case'

- Text: The problem is studied by Borceux, where it is shown that the result is internally true, an equivalent condition is found in the boolean case, and certain preservation properties are shown
- Concepts: 'problem', 'internally true', 'equivalent condition', 'boolean case', 'preservation properties'

- Text: We look at two different approaches to the problem, one based on a generalization of projectivity, and the other based on looking at the most extreme sorts of counterexamples.
- Concepts: 'generalization', 'projectivity', 'counterexamples'

- Text: In this paper the machinery and results developed in [Awodey et al., 2004] are extended to the study of constructive set theories
- Concepts: 'machinery', 'results', 'constructive set theories'

- Text: Specifically, we introduce two constructive set theories BCST and CST and prove that they are sound and complete with respect to models in categories with certain structure
- Concepts: set theories', 'constructive', 'soundness', 'completeness', 'models', 'categories', 'structure'

- Text: Specifically, basic categories of classes and categories of classes are axiomatized and shown to provide models of the aforementioned set theories
- Concepts: 'categories', 'classes', 'set theories', 'models', 'axiomatized'

- Text: Finally, models of these theories are constructed in the category of ideals.
- Concepts: 'category', 'ideals', 'models'

- Text: In this paper, we examine a new approach to topos theory - rather than considering subobjects, look at quotients
- Concepts: 'topos theory', 'subobjects', 'quotients'

- Text: This leads to the notion of a copower object, which is the object of quotients of a given object
- Concepts: 'copower object', 'object of quotients'

- Text: We study some properties of copower objects, many of which are similar to the properties of power objects
- Concepts: 'copower objects', 'power objects', 'properties'

- Text: Given enough categorical structure (i.e
- Concepts: 'categorical structure'

- Text: in a pretopos) it is possible to get power objects from copower objects, and vice versa. We then examine some new definitions of finiteness arising from the notion of a copower object
- Concepts: 'pretopos', 'power objects', 'copower objects', 'finiteness'

- Text: We will see that the most naturally occurring such notions are equivalent to the standard notions, K-finiteness (at least for well-pointed objects) and $\tilde{K}$-finiteness, but that this new way of looking at them gives new information, and in fact gives rise to another notion of finiteness, which is related to the classical notion of an amorphous set - i.e
- Concepts: 'K-finiteness', '$\tilde{K}$-finiteness', 'finiteness', 'amorphous set'

- Text: an infinite set that is not the disjoint union of two infinite sets. Finally, We look briefly at two similar notions: potency objects and per objects.
- Concepts: 'infinite set', 'disjoint union', 'potency objects', 'per objects'

- Text: The process some call `categorification' consists of interpreting set-theoretic structures in mathematics as derived from category-theoretic structures
- Concepts: 'categorification', 'set-theoretic structures', 'category-theoretic structures'

- Text: Examples include the interpretation of N as the Burnside rig of the category of finite sets with product and coproduct, and of N[x] in terms the category of combinatorial species
- Concepts: Burnside rig, category of finite sets, product, coproduct, N[x, combinatorial species

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- Text: This has interesting applications to quantum mechanics, and in particular the quantum harmonic oscillator, via Joyal's `combinatorial species', and a new generalization called `stuff types' described by Baez and Dolan, which are a special case of Kelly's `clubs'
- Concepts: quantum mechanics, quantum harmonic oscillator, combinatorial species, stuff types, clubs, generalization

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- Text: Operators between stuff types be represented as rudimentary Feynman diagrams for the oscillator
- Concepts: 'operators', 'stuff types', 'Feynman diagrams', 'oscillator'

- Text: In quantum mechanics, we want to represent states in an algebra over the complex numbers, and also want our Feynman diagrams to carry more structure than these `stuff operators' can do, and these turn out to be closely related

- Concepts: 'quantum mechanics', 'algebra', 'complex numbers', 'Feynman diagrams', 'structure', 'operators'

- Text: We will describe a categorification of the quantum harmonic oscillator in which the group of `phases' - that is, U(1), the circle group - plays a special role
- Concepts: 'categorification', 'quantum harmonic oscillator', 'group', 'phases', 'U(1)', 'circle group', 'special role'

- Text: We describe a general notion of `M-stuff types' for any monoid M, and see that the case M = U(1) provides an interpretation of time evolution in the combinatorial setting, as well as recovering the usual Feynman rules for the quantum harmonic oscillator.
- Concepts: 'monoid', 'time evolution', 'combinatorial setting', 'Feynman rules', 'quantum harmonic oscillator'

- Text: Motivated by applications to Mackey functors, Serge Bouc characterized pullback and finite coproduct preserving functors between categories of permutation representations of finite groups
- Concepts: 'Mackey functors', 'pullback', 'finite coproduct', 'permutation representations', 'finite groups'

- Text: Initially surprising to a category theorist, this result does have a categorical explanation which we provide.
- Concepts: 'category theorist', 'categorical explanation'

- Text: What remains of a geometrical notion like that of a principal bundle when the base space is not a manifold but a coarse graining of it, like the poset formed by a base for the topology ordered under inclusion? Motivated by the search for a geometrical framework for developing gauge theories in algebraic quantum field theory, we give, in the present paper, a first answer to this question
- Concepts: 'principal bundle', 'base space', 'coarse graining', 'poset', 'topology', 'inclusion', 'geometrical framework', 'gauge theories', 'algebraic quantum field theory'

- Text: The notions of transition function, connection form and curvature form find a nice description in terms of cohomology, in general non-Abelian, of a poset with values in a group G
- Concepts: 'transition function', 'connection form', 'curvature form', 'cohomology', 'non-Abelian', 'poset', 'group G'

- Text: Interpreting a 1-cocycle as a principal bundle, a connection turns out to be a 1-cochain associated in a suitable way with this 1-cocycle; the curvature of a connection turns out to be its 2-coboundary
- Concepts: '1-cocycle', 'principal bundle', 'connection', '1-cochain', 'curvature', '2-coboundary'

- Text: We show the existence of nonflat connections, and relate flat connections to homomorphisms of the fundamental group of the poset into G

- Concepts: 'connections', 'nonflat connections', 'flat connections', 'homomorphisms', 'fundamental group', 'poset'

- Text: We discuss holonomy and prove an analogue of the Ambrose-Singer theorem.
- Concepts: holonomy, Ambrose-Singer theorem

- Text: Given a groupoid G one has, in addition to the equivalence of categories E from G to its skeleton, a fibration F from G to its set of connected components (seen as a discrete category)
- Concepts: 'groupoid', 'equivalence of categories', 'skeleton', 'connected components', 'discrete category', 'fibration'

- Text: From the observation that E and F differ unless G[x,x]=id_x for every object x of G, we prove there is a fibered equivalence from C[\Sigma^{-1}] to C/\Sigma when \Sigma is a Yoneda-system of a loop-free category C
- Concepts: Yoneda-system, loop-free category, fibered equivalence

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- Text: In fact, all the equivalences from C[\Sigma^{-1}]$ to C/\Sigma are fibered
- Concepts: equivalences, fibered

- Text: Furthermore, since the quotient C/\Sigma shrinks as \Sigma grows, we define the component category of a loop-free category as C/{\overline{\Sigma}} where \overline{\Sigma} is the greatest Yoneda-system of C.

- Concepts: 'quotient', 'component category', 'loop-free category', 'Yoneda-system'

- Text: Directed Algebraic Topology is a recent field, deeply linked with ordinary and higher dimensional Category Theory
- Concepts: 'Directed Algebraic Topology', 'higher dimensional Category Theory'

- Text: A `directed space', e.g
- Concepts: 'directed space'

- Text: an ordered topological space, has directed homotopies (which are generally non reversible) and a fundamental category (replacing the fundamental groupoid of the classical case)
- Concepts: 'ordered topological space', 'directed homotopies', 'fundamental category', 'fundamental groupoid'

- Text: Finding a simple - possibly finite - model of the latter is a non-trivial problem, whose solution gives relevant information on the given `space'; a problem which is of interest for applications as well as in general Category Theory
- Concepts: 'simple model', 'finite model', 'non-trivial problem', 'relevant information', 'space', 'applications', 'Category Theory'

- Text: Here we continue the work ``The shape of a category up to directed homotopy'', with a deeper analysis of `surjective models', motivated by studying the singularities of 3-dimensional ordered spaces.

- Concepts: 'category', 'directed homotopy', 'surjective models', 'singularities', '3-dimensional ordered spaces'

- Text: Given an additive equational category with a closed symmetric monoidal structure and a potential dualizing object, we find sufficient conditions that the category of topological objects over that category has a good notion of full subcategories of strong and weakly topologized objects and show that each is equivalent to the chu category of the original category with respect to the dualizing object.
- Concepts: 'additive equational category', 'closed symmetric monoidal structure', 'dualizing object', 'category of topological objects', 'full subcategories', 'strongly topologized objects', 'weakly topologized objects', 'chu category'

- Text: Motivated by a desire to gain a better understanding of the ``dimension-by-dimension'' decompositions of certain prominent monads in higher category theory, we investigate descent theory for endofunctors and monads
- Concepts: 'monads', 'higher category theory', 'dimension-by-dimension decompositions', 'endofunctors', 'descent theory'

- Text: After setting up a basic framework of indexed monoidal categories, we describe a suitable subcategory of Cat over which we can view the assignment C |-> Mnd(C) as an indexed category; on this base category, there is a natural topology

- Concepts: 'indexed monoidal categories', 'subcategory', 'Cat', 'assignment', 'Mnd(C)', 'indexed category', 'base category', 'natural topology'

- Text: Then we single out a class of monads which are well-behaved with respect to reindexing
- Concepts: monads', 'reindexing', 'well-behaved'

- Text: The main result is now, that such monads form a stack
- Concepts: monads, stack

- Text: Using this, we can shed some light on the free strict ω-category monad on globular sets and the free operad-with-contraction monad on the category of collections.
- Concepts: 'strict ω-category', 'monad', 'globular sets', 'operad-with-contraction', 'category of collections'

- Text: In this paper equivalence of the concepts of ana-bicategory and the 2D-multitopic category is proved
- Concepts: ana-bicategory', '2D-multitopic category', 'equivalence'

- Text: The equivalence is FOLDS equivalence of the FOLDS-Specifications of the two concepts
- Concepts: 'equivalence', 'FOLDS equivalence', 'FOLDS-Specifications', 'concepts'

- Text: Two constructions for transforming one form of category to another are given and it is shown that we get a structure equivalent to the original one when we compose the two constructions.

- Concepts: 'constructions', 'transforming', 'category', 'structure', 'compose', 'equivalent'

- Text: The well-known notion of crossed module of groups is raised in this paper to the categorical level supported by the theory of categorical groups
- Concepts: 'crossed module', 'groups', 'categorical level', 'theory of categorical groups'

- Text: We construct the cokernel of a categorical crossed module and we establish the universal property of this categorical group
- Concepts: 'categorical crossed module', 'cokernel', 'universal property', 'categorical group'

- Text: We also prove a suitable 2-dimensional version of the kernel-cokernel lemma for a diagram of categorical crossed modules
- Concepts: 'kernel-cokernel lemma', 'diagram', 'categorical', 'crossed modules', '2-dimensional'

- Text: We then study derivations with coefficients in categorical crossed modules and show the existence of a categorical crossed module given by inner derivations
- Concepts: 'derivations', 'coefficients', 'categorical crossed modules', 'inner derivations'

- Text: This allows us to define the low-dimensional cohomology categorical groups and, finally, these invariants are connected by a six-term 2-exact sequence obtained by using the kernel-cokernel lemma.
- Concepts: 'cohomology', 'categorical groups', 'invariants', 'six-term 2-exact sequence', 'kernel-cokernel lemma'

- Text: Given a topological space X, $K(X)$ denotes the upper semi-lattice of its (Hausdorff) compactifications
- Concepts: 'topological space', 'Hausdorff', 'compactifications', 'upper semi-lattice'

- Text: Recent studies have asked when, for $\alpha X \in K(X)$, the restriction homomorphism $\rho : C(\alpha X) \to C(X)$ is an epimorphism in the category of commutative rings
- Concepts: αX, $K(X)$, restriction homomorphism, epimorphism, category, commutative rings

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- Text: This article continues this study by examining the sub-semilattice, $K_{epi}(X)$, of those compactifications where ρ is an epimorphism along with two of its subsets, and its complement $K_{nepi}(X)$
- Concepts: 'sub-semilattice', 'compactifications', 'epimorphism', 'subset', 'complement', 'nepi'

- Text: The role of $K_z(X)\subseteq K(X)$ of those αX where X is z-embedded in αX, is also examined
- Concepts: 'K_z(X)', 'K(X)', 'z-embedded'

- Text: The cases where X is a P-space and, more particularly, where X is discrete, receive special attention.
- Concepts: P-space, discrete

- Text: This paper studies numerals, natural numbers objects and, more generally, free actions, in a topos
- Concepts: 'numerals', 'natural numbers objects', 'free actions', 'topos'

- Text: A pre-numeral is a poset with a constant, 0, and a unary operation, s, such that: x\leq y implies sx \leq sy x\leq sx A numeral is a minimal pre-numeral.
- Concepts: 'pre-numeral', 'poset', 'constant', 'unary operation', 'minimal pre-numeral'

- Text: A representation theory for (strict) categorical groups is constructed
- Concepts: 'representation theory', 'categorical groups'

- Text: Each categorical group determines a monoidal bicategory of representations
- Concepts: 'categorical group', 'monoidal bicategory', 'representations'

- Text: Typically, these bicategories contain representations which are indecomposable but not irreducible
- Concepts: 'bicategories', 'representations', 'indecomposable', 'irreducible'

- Text: A simple example is computed in explicit detail.
- Concepts: 'simple example', 'computed', 'explicit detail' (no specific Math concepts mentioned in this context)

- Text: Two constructions of paths in double categories are studied, providing algebraic versions of the homotopy groupoid of a space
- Concepts: 'double categories', 'paths', 'algebraic versions', 'homotopy groupoid', 'space'

- Text: Universal properties of these constructions are presented
- Concepts: 'universal properties', 'constructions'

- Text: The first is seen as the codomain of the universal oplax morphism of double categories and the second, which is a quotient of the first, gives the universal normal oplax morphism
- Concepts: 'codomain', 'universal oplax morphism', 'double categories', 'quotient', 'normal oplax morphism'

- Text: Normality forces an equivalence relation on cells, a special case of which was seen before in the free adjoint construction
- Concepts: 'normality', 'equivalence relation', 'cells', 'free adjoint construction'

- Text: These constructions are the object part of 2-comonads which are shown to be oplax idempotent
- Concepts: '2-comonads', 'op-lax idempotent'

- Text: The coalgebras for these comonads turn out to be Leinster's fc-multicategories, with representable identities in the second case.
- Concepts: 'coalgebras', 'comonads', 'fc-multicategories', 'representable identities'

- Text: A flow on a compact Hausdorff space X is given by a map t : X --> X
- Concepts: 'flow', 'compact', 'Hausdorff space', 'map'

- Text: The general goal of this paper is to find the ''cyclic parts'' of such a flow
- Concepts: 'cyclic parts', 'flow'

- Text: To do this, we approximate (X,t) by a flow on a Stone space (that is, a totally disconnected, compact Hausdorff space)
- Concepts: 'approximate', 'flow', 'Stone space', 'totally disconnected', 'compact', 'Hausdorff space'

- Text: Such a flow can be examined by analyzing the resulting flow on the Boolean algebra of clopen subsets, using the spectrum defined in our previous TAC paper, The cyclic spectrum of a Boolean flow
- Concepts: 'Boolean algebra', 'clopen subsets', 'spectrum', 'cyclic spectrum', 'Boolean flow'

- Text: In this paper, we describe the cyclic spectrum in terms that do not rely on topos theory

- Concepts: 'cyclic spectrum', 'topos theory'

- Text: We then compute the cyclic spectrum of any finitely generated Boolean flow
- Concepts: 'cyclic spectrum', 'finitely generated', 'Boolean flow'

- Text: We define when a sheaf of Boolean flows can be regarded as cyclic and find necessary conditions for representing a Boolean flow using the global sections of such a sheaf
- Concepts: 'sheaf', 'Boolean flows', 'cyclic', 'representing', 'global sections'

- Text: In the final section, we define and explore a related spectrum based on minimal subflows of Stone spaces.
- Concepts: 'spectrum', 'minimal subflows', 'Stone spaces'

- Text: The correlators of two-dimensional rational conformal field theories that are obtained in the TFT construction of Fuchs, Runkel and Schweigert are shown to be invariant under the action of the relative modular group and to obey bulk and boundary factorisation constraints
- Concepts: two-dimensional, rational conformal field theories, TFT construction, relative modular group, bulk factorisation constraints, boundary factorisation constraints

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- Text: We present results both for conformal field theories defined on oriented surfaces and for theories defined on unoriented surfaces

- Concepts: 'conformal field theory', 'oriented surfaces', 'unoriented surfaces'

- Text: In the latter case, in particular the so-called cross cap constraint is included.
- Concepts: 'cross cap constraint'

- Text: The construction of a free restriction category can be broken into two steps: the construction of a free stable semilattice fibration followed by the construction of a free restriction category for this fibration
- Concepts: 'restriction category', 'free restriction category', 'stable semilattice fibration', 'free stable semilattice fibration'

- Text: Restriction categories produced from such fibrations are `unitary', in a sense which generalizes that from the theory of inverse semigroups
- Concepts: 'Restriction categories', 'fibrations', 'unitary', 'theory of inverse semigroups'

- Text: Characterization theorems for unitary restriction categories are derived
- Concepts: unitary restriction categories, characterization theorems

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- Text: The paper ends with an explicit description of the free restriction category on a directed graph.

- Concepts: 'restriction category', 'free restriction category', 'directed graph', 'explicit description'

- Text: A quantaloid is a sup-lattice-enriched category; our subject is that of categories, functors and distributors enriched in a base quantaloid $\mathcal{Q}$
- Concepts: 'quantaloid', 'sup-lattice-enriched category', 'enriched category', 'base quantaloid', 'functor', 'distributor'

- Text: We show how cocomplete $\mathcal{Q}$-categories are precisely those which are tensored and conically cocomplete, or alternatively, those which are tensored, cotensored and `order-cocomplete'
- Concepts: 'cocomplete', '$\mathcal{Q}$-category', 'tensored', 'conically cocomplete', 'cotensored', 'order-cocomplete'

- Text: In fact, tensors and cotensors in a $\mathcal{Q}$-category determine, and are determined by, certain adjunctions in the category of $\mathcal{Q}$-categories; some of these adjunctions can be reduced to adjuctions in the category of ordered sets
- Concepts: 'tensors', 'cotensors', '$\mathcal{Q}$-category', 'adjunctions', 'category of $\mathcal{Q}$-categories', 'ordered sets'

- Text: Bearing this in mind, we explain how tensored $\mathcal{Q}$-categories are equivalent to order-valued closed pseudofunctors on $\mathcal{Q}^{op}$; this result is then finetuned to obtain in particular that cocomplete

$\mathcal{Q}$-categories are equivalent to sup-lattice-valued homomorphisms on $\mathcal{Q}^{op}$ (a.k.a.\ $\mathcal{Q}$-modules).

- Concepts: $\mathcal{Q}$-categories, tensored $\mathcal{Q}$-categories, order-valued closed pseudofunctors, $\mathcal{Q}^{op}$, cocomplete $\mathcal{Q}$-categories, sup-lattice-valued homomorphisms, $\mathcal{Q}$-modules

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- Text: We say that a class $\mathbb{D}$ of categories is the Bourn localization of a class $\mathbb{C}$ of categories, and we write $\mathbb{D} = \mathrm{Loc}\mathbb{C}$, if $\mathbb{D}$ is the class of all (finitely complete) categories $\mathcal{D}$ such that for each object A in $\mathcal{D}$, $\mathrm{Pt}(\mathcal{D}\downarrow A) \in \mathbb{C}$, where $\mathrm{Pt}(\mathcal{D}\downarrow A)$ denotes the category of all pointed objects in the comma-category $(\mathcal{D}\downarrow A)$
- Concepts: 'category', 'Bourn localization', 'finitely complete', 'object', 'comma-category', 'pointed objects'

- Text: As D
- Concepts: None provided. Please provide the full context to extract the math concepts.

- Text: Bourn showed, if we take $\mathbb{D}$ to be the class of Mal'tsev categories in the sense of A
- Concepts: 'Mal'tsev categories'

- Text: Carboni, J
- Concepts: None - The given context only includes a person's name, which does not denote any specific math concept.

- Text: Lambek, and M
- Concepts: Lambek

- Text: C
- Concepts: no Math concepts are present in this incomplete context

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- Text: Pedicchio, and $\mathbb{C}$ to be the class of unital categories in the sense of D
- Concepts: 'unital categories'

- Text: Bourn, which generalize pointed Jónsson-Tarski varieties, then $\mathbb{D} = \mathrm{Loc}(\mathbb{C})$
- Concepts: 'generalize', 'Jónsson-Tarski varieties', 'Loc'

- Text: A similar result was obtained by the author: if $\mathbb{D}$ is as above and $\mathbb{C}$ is the class of subtractive categories, which generalize pointed subtractive varieties in the sense of A
- Concepts: 'subtractive categories', 'pointed subtractive varieties'

- Text: Ursini, then $\mathbb{D} = \mathrm{Loc}(\mathbb{C})$
- Concepts: 'Ursini', '$\mathbb{D}$', 'Loc', '$\mathbb{C}$'

- Text: In the present paper we extend these results to abstract classes of categories obtained from classes of varieties
- Concepts: 'abstract classes', 'categories', 'classes of varieties'

- Text: We also show that the Bourn localization of the union of the classes of unital and subtractive categories is still the class of Mal'tsev categories.
- Concepts: 'Bourn localization', 'union', 'classes', 'unital categories', 'subtractive categories', 'Mal'tsev categories'

- Text: Let L be an arbitrary orthomodular lattice
- Concepts: 'orthomodular lattice'

- Text: There is a one to one correspondence between orthomodular sublattices of L satisfying an extra condition and quantic quantifiers
- Concepts: 'one to one correspondence', 'orthomodular sublattices', 'extra condition', 'quantic quantifiers'

- Text: The category of orthomodular lattices is equivalent to the category of posets having two families of endofunctors satisfying six conditions.
- Concepts: 'orthomodular lattices', 'category', 'equivalent', 'posets', 'endofunctors', 'six conditions'

- Text: We study closedness properties of internal relations in finitely complete categories, which leads to developing a unified approach to: Mal'tsev categories, in the sense of A

- Concepts: 'internal relations', 'finitely complete categories', 'Mal'tsev categories'

- Text: Carboni, J
- Concepts: There are no math concepts mentioned in this context.

- Text: Lambek and M
- Concepts: 'Lambek', 'M' (There are no math concepts mentioned in this context.)

- Text: C
- Concepts: None given - there is no information in the context to extract math concepts from.

- Text: Pedicchio, that generalize Mal'tsev varieties of universal algebras; unital categories, in the sense of D
- Concepts: 'generalize', 'Mal\'tsev varieties', 'universal algebras', 'unital categories', 'sense', 'D'

- Text: Bourn, that generalize pointed Jónsson-Tarski varieties; and subtractive categories, introduced by the author, that generalize pointed subtractive varieties in the sense of A
- Concepts: generalize, pointed, Jónsson-Tarski varieties, subtractive categories, pointed subtractive varieties

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- Text: Ursini.

- Concepts: None, as there are no math concepts mentioned in the given context.

- Text: We consider exponentiable objects in lax slices of Top with respect to the specialization order (and its opposite) on a base space B
- Concepts: 'exponentiable objects', 'lax slices', 'Top', 'specialization order', 'base space'

- Text: We begin by showing that the lax slice over B has binary products which are preserved by the forgetful functor to Top if and only if B is a meet (respective, join) semilattice in Top, and go on to characterize exponentiability over a complete Alexandrov space B.
- Concepts: 'lax slice', 'binary products', 'forgetful functor', 'Top', 'meet semilattice', 'join semilattice', 'complete Alexandrov space', 'exponentiability'

- Text: For a differential graded k-quiver Q we define the free A_\infty-category FQ generated by Q
- Concepts: 'differential graded', 'k-quiver', 'free A_\infty-category', 'generated'

- Text: The main result is that the restriction A_\infty-functor A_\infty(FQ, A) \to A_1(Q,A) is an equivalence, where objects of the last A_\infty-category are morphisms of differential graded k-quivers Q \to A.

- Concepts: 'A_\infty-functor', 'A_\infty-category', 'restriction', 'equivalence', 'differential graded k-quivers'

- Text: It is shown that the cubical nerve of a strict omega-category is a sequence of sets with cubical face operations and distinguished subclasses of thin elements satisfying certain thin filler conditions
- Concepts: 'cubical nerve', 'omega-category', 'sequence of sets', 'cubical face operations', 'thin elements', 'thin filler conditions'

- Text: It is also shown that a sequence of this type is the cubical nerve of a strict omega-category unique up to isomorphism; the cubical nerve functor is therefore an equivalence of categories
- Concepts: 'cubical nerve', 'strict omega-category', 'isomorphism', 'equivalence of categories'

- Text: The sequences of sets involved are the analogues of cubical T-complexes appropriate for strict omega-categories
- Concepts: sequences of sets', 'cubical T-complexes', 'strict omega-categories'

- Text: Degeneracies are not required in the definition of these sequences, but can in fact be constructed as thin fillers
- Concepts: 'degeneracies', 'sequences', 'thin fillers'

- Text: The proof of the thin filler conditions uses chain complexes and chain homotopies.

- Concepts: 'chain complexes', 'chain homotopies', 'thin filler conditions'

- Text: We show, for an arbitrary adjunction $F \dashv U : \cal B \to \cal A$ with $\cal B$ Cauchy complete, that the functor F is comonadic if and only if the monad T on $\cal A$ induced by the adjunction is of effective descent type, meaning that the free T-algebra functor $F^{T}: \cal A \to \cal A^{T}$ is comonadic
- Concepts: 'adjunction', 'Cauchy complete', 'functor', 'comonadic', 'monad', 'effective descent type', 'free algebra functor'

- Text: This result is applied to several situations: In Section 4 to give a sufficient condition for an exponential functor on a cartesian closed category to be monadic, in Sections 5 and 6 to settle the question of the comonadicity of those functors whose domain is Set, or Set$_{\star}$, or the category of modules over a semisimple ring, in Section 7 to study the effectiveness of (co)monads on module categories
- Concepts: exponential functor, cartesian closed category, monadic, comonadicity, Set, Set$_{\star}$, modules, semisimple ring, (co)monads, module categories

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- Text: Our final application is a descent theorem for noncommutative rings from which we deduce an important result of A
- Concepts: 'descent theorem', 'noncommutative rings', 'important result', 'A'

- Text: Joyal and M
- Concepts: None given - the context is incomplete and does not mention any math concepts.

- Text: Tierney and of J.-P
- Concepts: None - the context does not mention any math concepts or topics.

- Text: Olivier, asserting that the effective descent morphisms in the opposite of the category of commutative unital rings are precisely the pure monomorphisms.
- Concepts: 'effective descent morphisms', 'opposite category', 'commutative unital rings', 'pure monomorphisms'

- Text: We give a Dialectica-style interpretation of first-order classical affine logic
- Concepts: 'Dialectica-style interpretation', 'first-order logic', 'classical logic', 'affine logic'

- Text: By moving to a contraction-free logic, the translation (a.k.a
- Concepts: None (The given context is incomplete and does not contain any math concepts.)

- Text: D-translation) of a first-order formula into a higher-type $\exists\forall$-formula can be made symmetric with respect to duality, including exponentials
- Concepts: first-order formula', 'higher-type formula', '$\exists\forall$-formula', 'duality', 'exponentials'

- Text: It turned out that the propositional part of our D-translation uses the same construction as de Paiva's dialectica category GC and we show how our D-translation extends GC to the first-order setting in terms of an indexed category
- Concepts: D-translation, propositional part, first-order setting, indexed category, dialectica category

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- Text: Furthermore the combination of Girard's ?!-translation and our D-translation results in the essentially equivalent $\exists\forall$-formulas as the double-negation translation and Godel's original D-translation.
- Concepts: 'Girard\'s ?!-translation', 'D-translation', 'double-negation translation', 'Godel\'s original D-translation', '$\exists\forall$-formulas'

- Text: This note investigates two generic constructions used to produce categorical models of linear logic, the Chu construction and the Dialectica construction, in parallel
- Concepts: 'categorical models', 'linear logic', 'Chu construction', 'Dialectica construction'

- Text: The constructions have the same objects, but are rather different in other ways
- Concepts: constructions', 'objects'

- Text: We discuss similarities and differences and prove that the Dialectica construction can be done over a symmetric monoidal closed basis

- Concepts: 'Dialectica construction', 'symmetric monoidal closed basis'

- Text: We also point out interesting open problems concerning the Dialectica construction.
- Concepts: 'Dialectica construction', 'open problems'

- Text: The cyclic Chu-construction for closed bicategories with pullbacks, which generalizes the original Chu-construction for symmetric monoidal closed categories, turns out to have a non-cyclic counterpart
- Concepts: 'cyclic Chu-construction', 'closed bicategories', 'pullbacks', 'Chu-construction', 'symmetric monoidal closed categories', 'non-cyclic counterpart'

- Text: Both use so-called Chu-spans as new 1-cells between 1-cells of the underlying bicategory, which form the new objects
- Concepts: 'Chu-spans', '1-cells', 'bicategory', 'objects'

- Text: Chu-spans may be seen as a natural generalization of 2-cell-spans in the base bicategory that no longer are confined to a single hom-category
- Concepts: Chu-spans', '2-cell-spans', 'generalization', 'bicategory', 'hom-category'

- Text: This view helps to clarify the composition of Chu-spans. We consider various approaches of linking the underlying bicategory with the newly constructed ones, e.g

- Concepts: 'composition', 'Chu-spans', 'bicategory', 'constructed ones'

- Text: by means of two-dimensional generalizations of bifibrations
- Concepts: two-dimensional, generalizations, bifibrations

- Text: In the quest for a better connection, we investigate, whether Chu-spans form a double category
- Concepts: Chu-spans', 'double category'

- Text: While this turns out not to be the case, we are led to considering a generalization of the construction to paths of 1-cells in the base, leading to two hierarchies of closed bicategories, one for linear paths and one for loops
- Concepts: 'generalization', 'construction', 'paths', '1-cells', 'base', 'hierarchies', 'closed bicategories', 'linear paths', 'loops'

- Text: The possibility of moving beyond paths, respectively, loops of the same length is indicated. Finally, Chu-spans in rel are identified as bipartite state transition systems
- Concepts: paths, loops, length, Chu-spans, rel, bipartite state transition systems

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- Text: Even though their composition may fail here due to the lack of pullbacks in rel, basic game-theoretic constructions can be performed on cyclic Chu-spans
- Concepts: pullbacks, game-theoretic constructions, cyclic Chu-spans

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- Text: These are available in all symmetric monoidal closed categories with finite products
- Concepts: 'symmetric monoidal closed category', 'finite product'

- Text: If pullbacks exist as well, the bicategory of cyclic Chu-spans inherits a monoidal structure that on objects coincides with the categorical product.
- Concepts: 'pullbacks', 'bicategory', 'cyclic Chu-spans', 'monoidal structure', 'categorical product'

- Text: This paper serves to bring three independent but important areas of computer science to a common meeting point: Formal Concept Analysis (FCA), Chu Spaces, and Domain Theory (DT)
- Concepts: 'Formal Concept Analysis', 'Chu Spaces', 'Domain Theory'

- Text: Each area is given a perspective or reformulation that is conducive to the flow of ideas and to the exploration of cross-disciplinary connections
- Concepts: 'area', 'perspective', 'reformulation', 'flow of ideas', 'cross-disciplinary connections'

- Text: Among other results, we show that the notion of state in Scott's information system corresponds precisely to that of formal concepts in FCA with respect to all finite Chu spaces, and the entailment relation corresponds to ``association rules''
- Concepts: 'Scott\'s information system', 'state', 'formal concepts', 'FCA', 'finite Chu spaces', 'entailment relation', 'association rules'

- Text: We introduce, moreover, the notion of approximable concept and show that approximable concepts represent algebraic lattices which are identical to Scott domains except the inclusion of a top element
- Concepts: 'approximable concept', 'algebraic lattices', 'Scott domains', 'inclusion', 'top element'

- Text: This notion serves as a stepping stone in recent work in which a new notion of morphism on formal contexts results in a category equivalent to (a) the category of complete algebraic lattices and Scott continuous functions, and (b) a category of information systems and approximable mappings.
- Concepts: formal contexts, morphism, category, complete algebraic lattices, Scott continuous functions, information systems, approximable mappings

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- Text: This paper describes a natural deduction formulation for Full Intuitionistic Linear Logic (FILL), an intriguing variation of multiplicative linear logic, due to Hyland and de Paiva
- Concepts: 'natural deduction formulation', 'Full Intuitionistic Linear Logic', 'FILL', 'multiplicative linear logic', 'Hyland', 'de Paiva'

- Text: The system FILL resembles intuitionistic logic, in that all its connectives are independent, but resembles classical logic in that its sequent-calculus formulation has intrinsic multiple conclusions
- Concepts: 'system FILL', 'intuitionistic logic', 'connectives', 'sequent-calculus', 'intrinsic multiple conclusions'

- Text: From the intrinsic multiple conclusions comes the inspiration to modify Parigot's natural deduction systems for classical logic, to produce a natural deduction formulation and a term assignment system for FILL.
- Concepts: 'multiple conclusions', 'natural deduction', 'classical logic', 'term assignment', 'FILL'

- Text: We show that any free *-autonomous category is equivalent (in a strict sense) to a free *-autonomous category in which the double-involution $(-)^{**}$ is the identity functor and the canonical isomorphism $A\simeq A^{**}$ is an identity arrow for all A.
- Concepts: '*-autonomous category', 'free *-autonomous category', 'double involution', 'identity functor', 'canonical isomorphism', 'identity arrow'

- Text: This paper describes the historical background and motivation involved in the discovery (or invention) of Chu categories.
- Concepts: 'Chu categories'

- Text: We define and study familial 2-functors primarily with a view to the development of the 2-categorical approach to operads of [Weber, 2005]
- Concepts: 'familial 2-functors', '2-functors', '2-categorical approach', 'operads'

- Text: Also included in this paper is a result in which the well-known characterisation of a category as a simplicial set via the Segal condition, is generalised to a result about nice monads on cocomplete categories
- Concepts: category, simplicial set, Segal condition, monads, cocomplete categories

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- Text: Instances of this general result can be found in [Leinster, 2004], [Berger, 2002] and [Moerdijk-Weiss, 2007b]
- Concepts: general result', 'Leinster', 'Berger', 'Moerdijk-Weiss'

- Text: Aspects of this general theory are then used to show that the composite 2-monads of [Weber, 2005] that describe symmetric and braided analogues of the ω-operads of [Batanin, 1998], are cartesian 2-monads and their underlying endo-2-functor is familial
- Concepts: 2-monads, symmetric, braided, ω-operads, cartesian 2-monads, underlying endo-2-functor, familial

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- Text: Intricately linked to the notion of familial 2-functor is the theory of fibrations in a finitely complete 2-category [Street, 1974] [Street, 1980], and those aspects of that theory that we require, that weren't discussed in [Weber, 2007], are reviewed here.
- Concepts: 'familial 2-functor', 'fibrations', 'finely complete 2-category'

- Text: We classify the "quotients" of a tannakian category in which the objects of a tannakian subcategory become trivial, and we examine the properties of such quotient categories.

- Concepts: 'tannakian category', 'tannakian subcategory', 'quotients', 'trivial objects', 'quotient categories'

- Text: We prove that the monoidal 2-category of cospans of ordinals and surjections is the universal monoidal category with an object X with a semigroup and a cosemigroup structures, where the two structures satisfy a certain 2-dimensional separable algebra condition.
- Concepts: 'monoidal 2-category', 'cospans', 'ordinals', 'surjections', 'universal monoidal category', 'semigroup', 'cosemigroup', '2-dimensional separable algebra condition'

- Text: Topological cospans and their concatenation, by pushout, appear in the theories of tangles, ribbons, cobordisms, etc
- Concepts: 'topological cospans', 'concatenation', 'pushout', 'tangles', 'ribbons', 'cobordisms'

- Text: Various algebraic invariants have been introduced for their study, which it would be interesting to link with the standard tools of Algebraic Topology, (co)homotopy and (co)homology functors. Here we introduce collarable (and collared) cospans between topological spaces
- Concepts: 'algebraic invariants', 'Algebraic Topology', '(co)homotopy', '(co)homology functors', 'collarable cospans', 'collared cospans', 'topological spaces'

- Text: They generalise the cospans which appear in the previous theories, as a consequence of a classical theorem on manifolds with boundary
- Concepts: 'cospans', 'manifolds with boundary', 'classical theorem'

- Text: Their interest lies in the fact that their concatenation is realised by means of homotopy pushouts
- Concepts: 'concatenation', 'homotopy pushouts'

- Text: Therefore, cohomotopy functors induce `functors' from collarable cospans to spans of sets, providing - by linearisation - topological quantum field theories (TQFT) on manifolds and their cobordisms
- Concepts: 'cohomotopy functors', 'collarable cospans', 'spans of sets', 'linearisation', 'topological quantum field theories', 'manifolds', 'cobordisms'

- Text: Similarly, (co)homology and homotopy functors take collarable cospans to relations of abelian groups or (co)spans of groups, yielding other `algebraic' invariants. This is the second paper in a series devoted to the study of cospans in Algebraic Topology
- Concepts: 'homology functors', 'homotopy functors', 'collarable cospans', 'relations of abelian groups', '(co)spans of groups', 'algebraic invariants', 'Algebraic Topology'

- Text: It is practically independent from the first, which deals with higher cubical cospans in abstract categories
- Concepts: 'higher cubical cospans', 'abstract categories'

- Text: The third article will proceed from both, studying cubical topological cospans and their collared version.
- Concepts: 'cubical topological cospans', 'collared version'

- Text: Following the analogy between algebras (monoids) and monoidal categories the construction of nucleus for non-associative algebras is simulated on the categorical level. Nuclei of categories of modules are considered as an example.
- Concepts: 'algebras', 'monoids', 'monoidal categories', 'nucleus', 'non-associative algebras', 'categories of modules'

- Text: We define the notion of an additive model category and prove that any stable, additive, combinatorial model category $\cal M$ has a model enrichment over $Sp^\Sigma(sAb)$ (symmetric spectra based on simplicial abelian groups)
- Concepts: additive model category', 'combinatorial model category', 'stable model category', 'model enrichment', 'symmetric spectra', 'simplicial abelian groups'

- Text: So to any object X in $\cal M$ one can attach an endomorphism ring object, denoted $hEnd_ad(X)$, in the category $Sp^\Sigma(sAb)$
- Concepts: 'object', '$\cal M$', 'endomorphism ring object', '$hEnd_ad(X)$', 'category', '$Sp^\Sigma(sAb)$'

- Text: We establish some useful properties of these endomorphism rings. We also develop a new notion in enriched category theory which we call `adjoint modules'
- Concepts: 'endomorphism rings', 'enriched category theory', 'adjoint modules'

- Text: This is used to compare enrichments over one symmetric monoidal model category with enrichments over a Quillen equivalent one
- Concepts: 'symmetric monoidal model category', 'enrichments', 'Quillen equivalent'

- Text: In particular, it is used here to compare enrichments over $\Sp^\Sigma(s\Ab)$ and chain complexes.
- Concepts: 'enrichments', '$\Sp^\Sigma$', 'sAb', 'chain complexes'

- Text: Given an arbitrary locally finitely presentable category K and finitary monads T and S on K, we characterize monad morphisms $\alpha: S\to T$ with the property that the induced functor $\alpha_*: K^T \to K^ S$ between the categories of Eilenberg-Moore algebras is fully faithful
- Concepts: locally finitely presentable category, finitary monads, monad morphisms, functor, Eilenberg-Moore algebras, fully faithful

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- Text: We call such monad morphisms dense and give a characterization of them in the spirit of Beth's definability theorem: α is a dense monad morphism if and only if every

T-operation is explicitly defined using S-operations

- Concepts: 'monad morphisms', 'dense', 'characterization', 'Beth's definability theorem', 'α', 'T-operation', 'S-operations', 'explicitly defined'

- Text: We also give a characterization in terms of epimorphic property of α and clarify the connection between various notions of epimorphisms between monads.
- Concepts: 'epimorphic', 'α', 'monads'

- Text: J.-L
- Concepts: None given (I cannot extract any math concepts from this short and vague context.)

- Text: Loday introduced the concept of coherent unit actions on a regular operad and showed that such actions give Hopf algebra structures on the free algebras
- Concepts: 'regular operad', 'coherent unit actions', 'Hopf algebra', 'free algebras'

- Text: Hopf algebras obtained this way include the Hopf algebras of shuffles, quasi-shuffles and planar rooted trees
- Concepts: 'Hopf algebras', 'shuffles', 'quasi-shuffles', 'planar rooted trees'

- Text: We characterize coherent unit actions on binary quadratic regular operads in terms of linear equations of the generators of the operads

- Concepts: 'coherent unit actions', 'binary quadratic regular operads', 'linear equations', 'generators'

- Text: We then use these equations to classify operads with coherent unit actions
- Concepts: 'equations', 'classify', 'operads', 'coherent unit actions'

- Text: We further show that coherent unit actions are preserved under taking products and thus yield Hopf algebras on the free object of the product operads when the factor operads have coherent unit actions
- Concepts: 'coherent unit actions', 'products', 'Hopf algebras', 'free object', 'product operads', 'factor operads'

- Text: On the other hand, coherent unit actions are never preserved under taking the dual in the operadic sense except for the operad of associative algebras.
- Concepts: 'coherent unit actions', 'dual', 'operadic sense', 'operad', 'associative algebras'

- Text: We define a notion of weak cubical category, abstracted from the structure of n-cubical cospans $x : \wedge^n \to X$ in a category X where $\wedge$ is the `formal cospan' category
- Concepts: 'weak cubical category', 'n-cubical cospans', 'formal cospan', 'category'

- Text: These diagrams form a cubical set with compositions $x +_i y$ in all directions, which are computed using pushouts and behave `categorically' in a weak sense, up to suitable comparisons

- Concepts: 'cubical set', 'compositions', 'pushouts', 'categorically', 'weak sense'

- Text: Actually, we work with a `symmetric cubical structure', which includes the transposition symmetries, because this allows for a strong simplification of the coherence conditions
- Concepts: 'symmetric cubical structure', 'transposition symmetries', 'coherence conditions'

- Text: These notions will be used in subsequent papers to study topological cospans and their use in Algebraic Topology, from tangles to cobordisms of manifolds. We also introduce the more general notion of a multiple category, where - to start with - arrows belong to different sorts, varying in a countable family, and symmetries must be dropped
- Concepts: 'topological cospans', 'Algebraic Topology', 'tangles', 'cobordisms', 'manifolds', 'multiple category', 'arrows', 'symmetries'

- Text: The present examples seem to show that the symmetric cubical case is better suited for topological applications.
- Concepts: 'symmetric cubical case', 'topological applications'

- Text: We discuss an approach to constructing a weak n-category of cobordisms
- Concepts: 'weak n-category', 'cobordisms'

- Text: First we present a generalisation of Trimble's definition of n-category which seems most appropriate for this construction; in this definition composition is parametrised by a contractible operad
- Concepts: 'n-category', 'Trimble's definition', 'composition', 'contractible operad'

- Text: Then we show how to use this definition to define the n-category nCob, whose k-cells are k-cobordisms, possibly with corners
- Concepts: 'n-category', 'k-cells', 'k-cobordisms', 'corners'

- Text: We follow Baez and Langford in using ``manifolds embedded in cubes'' rather than general manifolds
- Concepts: 'manifolds', 'embedded in cubes'

- Text: We make the construction for 1-manifolds embedded in 2- and 3-cubes
- Concepts: 'construction', 'manifolds', 'embedded', '2-cubes', '3-cubes'

- Text: For general dimensions k and n we indicate what the construction should be.
- Concepts: 'general dimensions', 'construction'

- Text: Usually bundle gerbes are considered as objects of a 2-groupoid, whose 1-morphisms, called stable isomorphisms, are all invertible

- Concepts: 'bundle gerbes', '2-groupoid', '1-morphisms', 'stable isomorphisms', 'invertible'

- Text: I introduce new 1-morphisms which include stable isomorphisms, trivializations and bundle gerbe modules
- Concepts: '1-morphisms', 'stable isomorphisms', 'trivializations', 'bundle gerbe modules'

- Text: They fit into the structure of a 2-category of bundle gerbes, and lead to natural definitions of surface holonomy for closed surfaces, surfaces with boundary, and unoriented closed surfaces.
- Concepts: 2-category, bundle gerbes, surface holonomy, closed surfaces, surfaces with boundary, unoriented closed surfaces

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- Text: We have shown that complete spreads (with a locally connected domain) over a bounded topos E (relative to S) are `comprehensive' in the sense that they are precisely the second factor of a factorization associated with an instance of the comprehension scheme involving S-valued distributions on E
- Concepts: 'complete spreads', 'locally connected domain', 'bounded topos', 'comprehensive', 'factorization', 'comprehension scheme', 'S-valued distributions'

- Text: Lawvere has asked whether the `Michael coverings' (or complete spreads with a definable dominance domain) are comprehensive in a similar fashion

- Concepts: 'comprehensive', 'Michael coverings', 'complete spreads', 'definable dominance domain'

- Text: We give here a positive answer to this question
- Concepts: positive answer'

- Text: In order to deal effectively with the comprehension scheme in this context, we introduce a notion of an `extensive topos doctrine,' where the extensive quantities (or distributions) have values in a suitable subcategory of what we call `locally discrete' locales
- Concepts: comprehension scheme, extensive topos doctrine, extensive quantities, subcategory, locally discrete locales

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- Text: In the process we define what we mean by a quasi locally connected topos, a notion that we feel may be of interest in its own right.
- Concepts: 'quasi locally connected', 'topos', 'notion'

- Text: The core of a category (first defined in ``Core algebra revisited'' Theoretical Computer Science, Vol 375, Issues 1-3, pp 193-200) has the structure of an abstract core algebra (first defined in the same place)
- Concepts: 'category', 'core of a category', 'abstract core algebra'

- Text: A question was left open: is there more structure yet to be defined? The answer is no: it is shown that any operation on an object arising from the fact that the object is the core of its

category can be defined using only the constant and two binary operations that appear in the definition of abstract core algebra
- Concepts: structure', 'object', 'category', 'core', 'operation', 'constant', 'binary operations', 'abstract core algebra', 'defined'

- Text: In the process a number of facts about abstract core algebras must be developed.
- Concepts: 'abstract core algebras'

- Text: New techniques for constructing a distributive law of a monad over another are studied using submonads, quotient monads, product monads, recursively-defined distributive laws, and linear equations
- Concepts: distributive law, monad, submonad, quotient monad, product monad, recursively-defined distributive law, linear equations

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- Text: Sequel papers will consider distributive laws in closed categories and will construct monad approximations for compositions which fail to be a monad.
- Concepts: 'distributive laws', 'closed categories', 'monad approximations', 'composition', 'monad'

- Text: In this paper we give a characterization of constructively completely distributive (CCD) lattices in presheaves on C, for C a small category with pullbacks.
- Concepts: 'constructively completely distributive', 'CCD lattices', 'presheaves', 'small category', 'pullbacks'

- Text: Francisco Marmolejo pointed out a mistake in the statement of Proposition 4.4 in our TAC paper (Vol
- Concepts: Proposition 4.4', 'TAC paper'

- Text: 16, No
- Concepts: None, as there are no words in the context that denote Math concepts.

- Text: 28)
- Concepts: None. The given context does not contain any information related to Math concepts.

- Text: The mistaken version is used later in that paper
- Concepts: No math concepts are present in this context.

- Text: Our purpose here is to correct the error by providing an explicit description of the finite coproduct completion of the dual of the category of connected G-sets
- Concepts: 'finite coproduct completion', 'dual', 'category', 'connected G-sets'

- Text: The description uses the distinguished morphisms of a factorization system on the category of G-sets.
- Concepts: 'morphisms', 'factorization system', 'category', 'G-sets'

- Text: We give an interpretation of Yetter's Invariant of manifolds M in terms of the homotopy type of the function space TOP(M,B(\cal G))$, where \cal G is a crossed module and B(\cal

G) is its classifying space

- Concepts: 'Yetter's Invariant', 'manifolds', 'homotopy type', 'function space', 'crossed module', 'classifying space'

- Text: From this formulation, there follows that Yetter's invariant depends only on the homotopy type of M, and the weak homotopy type of the crossed module \cal G
- Concepts: 'Yetter's invariant', 'homotopy type', 'weak homotopy type', 'crossed module'

- Text: We use this interpretation to define a twisting of Yetter's Invariant by cohomology classes of crossed modules, defined as cohomology classes of their classifying spaces, in the form of a state sum invariant
- Concepts: 'Yetter's Invariant', 'cohomology classes', 'crossed modules', 'classifying spaces', 'state sum invariant'

- Text: In particular, we obtain an extension of the Dijkgraaf-Witten Invariant of manifolds to categorical groups
- Concepts: 'Dijkgraaf-Witten invariant', 'manifolds', 'categorical groups', 'extension',

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- Text: The straightforward extension to crossed complexes is also considered.
- Concepts: 'crossed complexes'

- Text: Bicat is the tricategory of bicategories, homomorphisms, pseudonatural transformations, and modifications

- Concepts: 'bicategories', 'homomorphisms', 'pseudonatural transformations', 'modifications', 'tricategory'

- Text: Gray is the subtricategory of 2-categories, 2-functors, pseudonatural transformations, and modifications
- Concepts: 'subtricategory', '2-categories', '2-functors', 'pseudonatural transformations', 'modifications'

- Text: We show that these two tricategories are not triequivalent.
- Concepts: 'tricategories', 'triequivalent'

- Text: The notion of cartesian bicategory, introduced by Carboni and Walters for locally ordered bicategories, is extended to general bicategories
- Concepts: 'cartesian bicategory', 'locally ordered bicategories', 'general bicategories'

- Text: It is shown that a cartesian bicategory is a symmetric monoidal bicategory.
- Concepts: 'cartesian bicategory', 'symmetric monoidal bicategory'

- Text: Iterative algebras, defined by the property that every guarded system of recursive equations has a unique solution, are proved to have a much stronger property: every system of recursive equations has a unique strict solution
- Concepts: 'iterative algebras', 'guarded system', 'recursive equations', 'unique solution', 'strict solution'

- Text: Those systems that have a unique solution in every iterative algebra are characterized.
- Concepts: 'unique solution', 'iterative algebra', 'characterized'

- Text: It is the aim of this paper to compute the category of Eilenberg-Moore algebras for the monad arising from the dual unit-ball functor on the category of (semi)normed spaces
- Concepts: 'Eilenberg-Moore algebras', 'monad', 'dual unit-ball functor', '(semi)normed spaces'

- Text: We show that this gives rise to a stronger algebraic structure than the totally convex one obtained from the closed unit ball functor on the category of Banach spaces.
- Concepts: 'algebraic structure', 'totally convex', 'closed unit ball functor', 'category', 'Banach spaces'

- Text: Motivated by an analysis of Abramsky-Jagadeesan games, the paper considers a categorical semantics for a polarized notion of two-player games, a semantics which has close connections with the logic of (finite cartesian) sums and products, as well as with the multiplicative structure of linear logic
- Concepts: categorical semantics, polarized notion, two-player games, finite cartesian sums, finite cartesian products, multiplicative structure, linear logic

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- Text: In each case, the structure is polarized, in the sense that it will be modelled by two categories, one for each of two polarities, with a module structure connecting them

- Concepts: 'polarized', 'categories', 'module structure'

- Text: These are studied in considerable detail, and a comparison is made with a different notion of polarization due to Olivier Laurent: there is an adjoint connection between the two notions.
- Concepts: 'polarization', 'adjoint connection'

- Text: It is well known that the internal suplattices in the topos of sheaves on a locale are precisely the modules on that locale
- Concepts: 'internal sublattices', 'topos', 'sheaves', 'locale', 'modules'

- Text: Using enriched category theory and a lemma on KZ doctrines we prove (the generalization of) this fact in the case of ordered sheaves on a small quantaloid
- Concepts: 'enriched category theory', 'lemma', 'KZ doctrines', 'generalization', 'ordered sheaves', 'quantaloid'

- Text: Comparing module-equivalence with sheaf-equivalence for quantaloids and using the notion of centre of a quantaloid, we refine a result of F
- Concepts: 'module-equivalence', 'sheaf-equivalence', 'quantaloids', 'centre of a quantaloid', 'result', 'refine'

- Text: Borceux and E
- Concepts: No math concepts are mentioned in this context. The given information is not sufficient to extract any math concepts.

- Text: Vitale.
- Concepts: None (there are no math concepts mentioned in the given context)

- Text: We illustrate the formula $ (\downarrow p)x = \Gamma_!(x/p) $, which gives the reflection $\downarrow p$ of a category $p : P \to X$ over X in discrete fibrations
- Concepts: 'formula', 'reflection', 'category', 'discrete fibrations'

- Text: One of its proofs is based on a ``complement operator'' which takes a discrete fibration A to the functor $\neg A$, right adjoint to $\Gamma_!(A\times-):Cat/X \to Set$ and valued in discrete opfibrations
- Concepts: 'complement operator', 'discrete fibration', 'right adjoint', 'functor', 'opfibrations'

- Text: Some consequences and applications are presented.
- Concepts: None, as there are no words that denote Math concepts in this context.

- Text: The nature of the spatial background for classical analysis and for modern theories of continuum physics requires more than the partial invariants of locales and cohomology rings for its description
- Concepts: 'classical analysis', 'modern theories of continuum physics', 'spatial background', 'partial invariants', 'locales', 'cohomology rings', 'description'

- Text: As Maxwell emphasized, this description has various levels of precision depending on the needs of investigation
- Concepts: Maxwell, precision, investigation (no math concepts are present in this context)

- Text: These levels correspond to different categories of space, all of which have intuitively the feature of cohesion
- Concepts: 'levels', 'categories', 'space', 'cohesion'

- Text: Our aim here is to continue the axiomatic study of such categories, which involves the following aspects: I
- Concepts: 'axiomatic study', 'categories'

- Text: Categories of space as cohesive backgrounds II
- Concepts: 'Categories', 'space', 'cohesive backgrounds'

- Text: Cohesion versus non-cohesion; quality types III
- Concepts: 'cohesion', 'non-cohesion', 'quality types'

- Text: Extensive quality; intensive quality in its rarefied and condensed aspects; the canonical qualities form and substance IV
- Concepts: form, substance

- Text: Non-cohesion within cohesion via constancy on infinitesimals V
- Concepts: constancy, infinitesimals

- Text: The example of reflexive graphs and their atomic numbers VI
- Concepts: reflexive graphs', 'atomic numbers'

- Text: Sufficient cohesion and the Grothendieck condition VII
- Concepts: 'cohesion', 'Grothendieck condition VII'

- Text: Weak generation of a subtopos by a quotient topos I look forward to further work on each of these aspects, as well as development of categories of dynamical laws, constitutive relations, and other mathematical structures that naturally live in cohesive categories.
- Concepts: 'subtopos', 'quotient topos', 'categories', 'mathematical structures', 'cohesive categories'

- Text: In some bicategories, the 1-cells are `morphisms' between the 0-cells, such as functors between categories, but in others they are `objects' over the 0-cells, such as bimodules, spans, distributors, or parametrized spectra
- Concepts: 'bicategories', '1-cells', 'morphisms', '0-cells', 'functors', 'categories', 'objects', 'bimodules', 'spans', 'distributors', 'parametrized spectra'

- Text: Many bicategorical notions do not work well in these cases, because the `morphisms between 0-cells', such as ring homomorphisms, are missing
- Concepts: bicategorical', '0-cells', 'ring homomorphisms'

- Text: We can include them by using a pseudo double category, but usually these morphisms also induce base change functors acting on the 1-cells
- Concepts: 'pseudo double category', 'morphisms', 'base change functors', '1-cells'

- Text: We avoid complicated coherence problems by describing base change `nonalgebraically', using categorical fibrations
- Concepts: 'coherence problems', 'base change', 'categorical fibrations'

- Text: The resulting `framed bicategories' assemble into 2-categories, with attendant notions of equivalence, adjunction, and so on which are more appropriate for our examples than are the usual bicategorical ones. We then describe two ways to construct framed bicategories
- Concepts: 'framed bicategories', '2-categories', 'equivalence', 'adjunction'

- Text: One is an analogue of rings and bimodules which starts from one framed bicategory and builds another
- Concepts: 'analogue of rings', 'bimodules', 'framed bicategory'

- Text: The other starts from a `monoidal fibration', meaning a parametrized family of monoidal categories, and produces an analogue of the framed bicategory of spans
- Concepts: 'monoidal fibration', 'parametrized family', 'monoidal categories', 'framed bicategory', 'spans'

- Text: Combining the two, we obtain a construction which includes both enriched and internal categories as special cases.
- Concepts: 'enriched categories', 'internal categories', 'construction'

- Text: Recently, symmetric categorical groups are used for the study of the Brauer groups of symmetric monoidal categories
- Concepts: 'symmetric categorical groups', 'Brauer groups', 'symmetric monoidal categories'

- Text: As a part of these efforts, some algebraic structures of the 2-category of symmetric categorical groups SCG are being investigated
- Concepts: '2-category', 'symmetric categorical groups', 'algebraic structures'

- Text: In this paper, we consider a 2-categorical analogue of an abelian category, in such a way that it contains SCG as an example
- Concepts: '2-categorical', 'abelian category', 'SCG'

- Text: As a main theorem, we construct a long cohomology 2-exact sequence from any extension of complexes in such a 2-category
- Concepts: 'cohomology', '2-exact sequence', 'extension of complexes', '2-category'

- Text: Our axiomatic and self-dual definition will enable us to simplify the proofs, by analogy with abelian categories.
- Concepts: 'axiomatic definition', 'self-dual definition', 'simplify', 'proofs', 'analogy', 'abelian categories'

- Text: We prove a general theorem relating pseudo-exponentiable objects of a bicategory K to those of the Kleisli bicategory of a pseudo-monad on K
- Concepts: 'exponentiable objects', 'bicategory', 'Kleisli bicategory', 'pseudo-monad'

- Text: This theorem is applied to obtain pseudo-exponentiable objects of the homotopy slices Top//B of the category of topological spaces and the pseudo-slices Cat//B of the category of small categories.
- Concepts: theorem, exponentiable objects, homotopy slices, category, topological spaces, pseudo-slices

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- Text: We prove that, given any small category A$=, the derivator HOT_A, corresponding to the homotopy theory of presheaves of homotopy types on A, is characterized by a natural universal property
- Concepts: 'small category', 'HOT_A', 'derivator', 'homotopy theory', 'presheaves', 'homotopy types', 'natural universal property'

- Text: In particular, the theory of Kan extensions extends to the setting of Grothendieck derivators.

- Concepts: 'Kan extensions', 'Grothendieck derivators', 'theory'

- Text: We develop in some generality the dualities that often arise when one object lies in two different categories
- Concepts: dualities, categories

- Text: In our examples, one category is equational and the other consists of the topological objects in a (generally different) equational category.
- Concepts: category, equational category, topological objects

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- Text: The role of the Frobenius operations in analyzing finite spaces, as well as the extended algebraic geometry over rigs, depend partly on varieties (Birkhoffian inclusions of algebraic categories) that have coreflections as well as reflections and whose dual category of affine spaces is extensive
- Concepts: 'Frobenius operations', 'finite spaces', 'extended algebraic geometry', 'rigs', 'varieties', 'Birkhoffian inclusions', 'algebraic categories', 'coreflections', 'reflections', 'dual category', 'affine spaces', 'extensive'

- Text: Even within the category of those rigs where 1 + 1 = 1, not only distributive lattices but also the function algebras of tropical geometry (where x + 1 = 1) and the dimension rigs of separable prextensive categories (where x + x^2 = x^2) enjoy those features
- Concepts: category, rigs, distributive lattices, function algebras, tropical geometry, dimension rigs, separable prextensive categories

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- Text: (Talk given at CT08, Calais.)
- Concepts: None provided. The given context does not contain any specific mention or indication of Math concepts.

- Text: Assuming that B is a full A_∞-subcategory of a unital A_∞-category $\cc$ we construct the quotient unital A_∞-category $\cd=$`$\cc/\cb$'
- Concepts: 'A_∞-subcategory', 'unital A_∞-category', 'quotient unital A_∞-category'

- Text: It represents the A_∞^u-2-functor $A \mapsto A_\infty^u(C,A)_{mod B}$, which associates with a given unital A_∞-category A the A_∞-category of unital A_∞-functors $C \to A$, whose restriction to B is contractible
- Concepts: 'A∞-functor', 'A∞-category', 'unital', 'restriction', 'contractible'

- Text: Namely, there is a unital A_∞-functor $e: C \to D$ such that the composition $B \hookrightarrow C \to^e D$ is contractible, and for an arbitrary unital A_∞-category A the restriction A_∞-functor $(e\boxtimes 1)M : A_\infty^u(D,A)\to A_\infty^u(C,A)_{mod B}$ is an equivalence. Let C_k be the differential graded category of differential graded k-modules
- Concepts: 'unital', 'A_∞-functor', 'composition', 'contractible', 'unital A_∞-category', 'restriction', 'equivalence', 'differential graded category', 'differential graded

k-modules'

- Text: We prove that the Yoneda A_∞-functor $Y: A \to A_\infty^u(A^{op}, C_k)$ is a full embedding for an arbitrary unital A_∞-category A
- Concepts: 'Yoneda', 'A_∞-functor', 'full embedding', 'unital A_∞-category'

- Text: In particular, such A is A_∞-equivalent to a differential graded category with the same set of objects.
- Concepts: 'A_∞-equivalent', 'differential graded category', 'set of objects'

- Text: If C and D are varieties of algebras in the sense of general algebra, then by a representable functor C --> D we understand a functor which, when composed with the forgetful functor D --> Set, gives a representable functor in the classical sense; Freyd showed that these functors are determined by D-coalgebra objects of C
- Concepts: 'varieties of algebras', 'representable functor', 'general algebra', 'forgetful functor', 'classical sense', 'coalgebra objects'

- Text: Let Rep(C, D) denote the category of all such functors, a full subcategory of Cat(C, D, opposite to the category of D-coalgebras in C. It is proved that Rep(C, D) has small colimits, and in certain situations, explicit constructions for the representing coalgebras are obtained. In particular, Rep(C, D) always has an initial object

- Concepts: functors, category, full subcategory, colimits, coalgebras, initial object, representing coalgebras

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- Text: This is shown to be ``trivial'' unless C and D either both have no zeroary operations, or both have more than one derived zeroary operation
- Concepts: 'zeroary operations', 'derived zeroary operation'

- Text: In those two cases, the functors in question may have surprisingly opulent structures
- Concepts: 'functors', 'structures'

- Text: It is also shown that every set-valued representable functor on C admits a universal morphism to a D-valued representable functor
- Concepts: set-valued functor, representable functor, universal morphism, D-valued functor

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- Text: Several examples are worked out in detail, and areas for further investigation are noted.
- Concepts: None given, as there are no specific math concepts referenced in the context.

- Text: We construct a star-autonomous structure on the functor category K^J, where J is small, K is small-complete, and both are star-autonomous
- Concepts: 'functor category', 'star-autonomous structure', 'small-complete'

- Text: A weaker result, that K^J admits a linear distributive structure, is also shown under weaker hypotheses
- Concepts: linear distributive structure'

- Text: The latter leads to a deeper understanding of the notion of linear functor.
- Concepts: 'linear functor', 'notion'

- Text: Some aspects of basic category theory are developed in a finitely complete category $\cal C$, endowed with two factorization systems which determine the same discrete objects and are linked by a simple reciprocal stability law
- Concepts: 'category theory', 'finitely complete category', 'factorization systems', 'discrete objects', 'reciprocal stability law'

- Text: Resting on this axiomatization of final and initial functors and discrete (op)fibrations, concepts such as components, slices and coslices, colimits and limits, left and right adjunctible maps, dense maps and arrow intervals, can be naturally defined in $\cal C$, and several classical properties concerning them can be effectively proved
- Concepts: final functor, initial functor, discrete fibration, discrete opfibration, component, slice, coslice, colimit, limit, left adjoint, right adjoint, adjunctible map, dense map, arrow interval

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- Text: For any object X of $\cal C$, by restricting $\cal C/X$ to the slices or to the coslices of X, two dual ``underlying categories'' are obtained

- Concepts: object, category, slices, coslices, underlying categories

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- Text: These can be enriched over internal sets (discrete objects) of $\cal C$: internal hom-sets are given by the components of the pullback of the corresponding slice and coslice of X
- Concepts: 'enriched', 'internal sets', 'discrete objects', 'internal hom-sets', 'pullback', 'slice', 'coslice'

- Text: The construction extends to give functors $\cal C \to Cat$, which preserve (or reverse) slices and adjunctible maps and which can be enriched over internal sets too.
- Concepts: functors, category, slices, adjunctible maps, enriched, internal sets

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- Text: An effort to initiate the subject of the title: the basic tool is the study of the abstract closed interval equipped with certain equational structures.
- Concepts: 'abstract closed interval', 'equational structures'

- Text: This paper presents a sound and complete category-theoretic notion of models for Linear Abadi and Plotkin Logic, a logic suitable for reasoning about parametricity in combination with recursion
- Concepts: 'category-theoretic', 'models', 'Linear Abadi', 'Plotkin Logic', 'logic', 'parametricity', 'recursion'

- Text: A subclass of these called parametric LAPL structures can be seen as an axiomatization of domain theoretic models of parametric polymorphism, and we show how to solve general (nested) recursive domain equations in these
- Concepts: parametric LAPL structures, domain theoretic models, parametric polymorphism, nested recursive domain equations

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- Text: Parametric LAPL structures constitute a general notion of model of parametricity in a setting with recursion
- Concepts: Parametric LAPL structures', 'model of parametricity', 'setting', 'recursion'

- Text: In future papers we will demonstrate this by showing how many different models of parametricity and recursion give rise to parametric LAPL structures, including Simpson and Rosolini's set theoretic models, a syntactic model based on Lily and a model based on admissible pers over a reflexive domain.
- Concepts: parametricity, recursion, LAPL structures, set theoretic models, syntactic model, admissible pers, reflexive domain

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- Text: The author introduced and employed certain `fundamental pushout toposes' in the construction of the coverings fundamental groupoid of a locally connected topos
- Concepts: 'fundamental pushout toposes', 'construction', 'coverings', 'fundamental groupoid', 'locally connected topos'

- Text: Our main purpose in this paper is to generalize this construction without the local connectedness assumption

- Concepts: 'generalize', 'construction', 'local connectedness', 'assumption'

- Text: We replace connected components by constructively complemented, or definable, monomorphisms
- Concepts: 'connected components', 'complemented monomorphisms', 'definable monomorphisms'

- Text: Unlike the locally connected case, where the fundamental groupoid is localic prodiscrete and its classifying topos is a Galois topos, in the general case our version of the fundamental groupoid is a locally discrete progroupoid and there is no intrinsic Galois theory in the sense of Janelidze
- Concepts: 'locally connected', 'fundamental groupoid', 'localic prodiscrete', 'classifying topos', 'Galois topos', 'locally discrete', 'progroupoid', 'intrinsic Galois theory', 'Janelidze'

- Text: We also discuss covering projections, locally trivial, and branched coverings without local connectedness by analogy with, but also necessarily departing from, the locally connected case
- Concepts: 'covering projections', 'locally trivial', 'branched coverings'

- Text: Throughout, we work abstractly in a setting given axiomatically by a category V of locally discrete locales that has as examples the categories D of discrete locales, and Z of zero-dimensional locales

- Concepts: 'category', 'locally discrete', 'locales', 'discrete locales', 'zero-dimensional locales'

- Text: In this fashion we are led to give unified and often simpler proofs of old theorems in the locally connected case, as well as new ones without that assumption.
- Concepts: 'locally connected', 'theorems'

- Text: This paper deals with Kan extensions in a weak double category
- Concepts: 'Kan extensions', 'weak double category'

- Text: Absolute Kan extensions are closely related to the orthogonal adjunctions introduced in a previous paper
- Concepts: 'Absolute Kan extensions', 'orthogonal adjunctions'

- Text: The pointwise case is treated by introducing internal comma objects, which can be defined in an arbitrary double category.
- Concepts: 'internal comma objects', 'double category'

- Text: In this paper we show that eight coherence conditions suffice for the definition of a pseudodistributive law between pseudomonads.
- Concepts: 'coherence conditions', 'pseudodistributive law', 'pseudomonads'

- Text: We show that, in any Mal'tsev (and a fortiori protomodular) category E, not only the fibre Grd_X E of internal groupoids above the object X is a naturally Mal'tsev category, but moreover it shares with the category Ab of abelian groups the property following which the domain of any split epimorphism is isomorphic with the direct sum of its codomain with its kernel
- Concepts: 'Mal\'tsev category', 'protomodular category', 'internal groupoids', 'Abelian groups', 'split epimorphism', 'direct sum', 'kernel'

- Text: This allows us to point at a new class of ``non-pointed additive'' categories which is necessarily protomodular
- Concepts: 'non-pointed', 'additive', 'categories', 'protomodular'

- Text: Actually this even gives rise to a larger classification table of non-pointed additive categories which gradually take place between the class of naturally Mal'tsev categories and the one of essentially affine categories
- Concepts: 'classification table', 'additive categories', 'naturally Mal\'tsev categories', 'essentially affine categories'

- Text: As an application, when furthermore the ground category E is efficiently regular, we get a new way to produce Baer sums in the fibres Grd_X E and, more generally, in the fibres n-Grd_X E.
- Concepts: 'efficiently regular', 'Baer sums', 'fibres', 'Grd_X', 'n-Grd_X'

- Text: Maps (left adjoint arrows) between Frobenius objects in a cartesian bicategory B are precisely comonoid homomorphisms and, for A Frobenius and any T in B, map(B)(T,A) is a groupoid.
- Concepts: Frobenius objects, cartesian bicategory, comonoid homomorphisms, groupoid

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- Text: Using the reflection of the category C of compact 0-dimensional topological spaces into the category of Stone spaces we introduce a concept of a fibration in C
- Concepts: 'category', 'compact', 'topological spaces', 'Stone spaces', 'fibration'

- Text: We show that: (i) effective descent morphisms in C are the same as the surjective fibrations; (ii) effective descent morphisms in C with respect to the fibrations are all surjections.
- Concepts: effective descent morphisms, surjective fibrations, surjections

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- Text: Propositions 4.2 and 4.3 of the author's article (Theory Appl
- Concepts: Propositions, article, theory, application

- Text: Categ
- Concepts: 'category'

- Text: 14 (2005), 451-479) are not correct
- Concepts: None. There are no math concepts mentioned in this context.

- Text: We show that their use can be avoided and all remaining results remain correct. See note on p
- Concepts: None. The context does not include any words that denote math concepts.

- Text: 24.
- Concepts: None - The context "24" does not contain any words that denote math concepts.

- Text: Let X and A be sets and $\alpha:X\to A$ a map between them
- Concepts: 'sets', 'map'

- Text: We call a map $\mu:X\times X\times X\to A$ an approximate Mal'tsev operation with approximation α, if it satisfies $\mu(x,y,y) = \alpha(x) = \mu(y,y,x)$ for all $x,y\in X$
- Concepts: map, Mal'tsev operation, approximation, α, X, A

- Text: Note that if $A = X$ and the approximation α is an identity map, then μ becomes an ordinary Mal'tsev operation
- Concepts: identity map, Mal'tsev operation

- Text: We prove the following two characterization theorems: a category $\mathbb{X}$ is a Mal'tsev category if and only if in the functor category $\mathbf{Set}^{\mathbb{X}^\mathrm{op}\times\mathbb{X}}$ there exists an internal approximate Mal'tsev operation

$\mathrm{hom}_{\mathbb{X}}\times \mathrm{hom}_{\mathbb{X}}\times \mathrm{hom}_{\mathbb{X}}\rightarrow A$ whose approximation α satisfies a suitable condition; a regular category $\mathbb{X}$ with finite coproducts is a Mal'tsev category, if and only if in the functor category $\mathbb{X}^\mathbb{X}$ there exists an internal approximate Mal'tsev co-operation $A\rightarrow 1_\mathbb{X}+1_\mathbb{X}+1_\mathbb{X}$ whose approximation α is a natural transformation with every component a regular epimorphism in $\mathbb{X}$

- Concepts: category, Mal'tsev category, functor category, internal approximate Mal'tsev operation, hom, regular category, finite coproducts, internal approximate Mal'tsev co-operation, natural transformation, regular epimorphism

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- Text: Note that in both of these characterization theorems, if require further the approximation α to be an identity morphism, then the conditions there involving α become equivalent to $\mathbb{X}$ being a naturally Mal'tsev category.
- Concepts: 'characterization theorems', 'approximation', 'identity morphism', 'naturally Mal'tsev category'

- Text: We show how to formulate the notion of locally cartesian closed category without chosen pullbacks, by the use of Makkai's theory of anafunctors.
- Concepts: 'locally cartesian closed category', 'pullbacks', 'Makkai's theory', 'anafunctors'

- Text: Notions and techniques of enriched category theory can be used to study topological structures, like metric spaces, topological spaces and approach spaces, in the context of topological theories
- Concepts: 'enriched category theory', 'metric spaces', 'topological spaces', 'approach spaces', 'topological theories'

- Text: Recently in [D
- Concepts: None provided. Please provide a valid context to extract concepts from.

- Text: Hofmann, Injective spaces via adjunction, arXiv:math.CT/0804.0326] the construction of a Yoneda embedding allowed to identify injectivity of spaces as cocompleteness and to show monadicity of the category of injective spaces and left adjoints over SET
- Concepts: 'Yoneda embedding', 'injectivity of spaces', 'cocompleteness', 'monadicity', 'category of injective spaces', 'left adjoints', 'SET'

- Text: In this paper we generalise these results, studying cocompleteness with respect to a given class of distributors
- Concepts: 'cocompleteness', 'class of distributors'

- Text: We show in particular that the description of several semantic domains presented in [M
- Concepts: 'semantic domains'

- Text: Escardo and B
- Concepts: None given. The context does not contain any statements related to math concepts.

- Text: Flagg, Semantic domains, injective spaces and monads, Electronic Notes in Theoretical Computer Science 20 (1999)] can be translated into the V-enriched setting.
- Concepts: 'Semantic domains', 'injective spaces', 'monads', 'V-enriched setting'

- Text: For accessible set-valued functors it is well known that weak preservation of limits is equivalent to representability, and weak preservation of connected limits to familial representability
- Concepts: 'accessible set-valued functors', 'weak preservation of limits', 'representability', 'weak preservation of connected limits', 'familial representability'

- Text: In contrast, preservation of weak wide pullbacks is equivalent to being a coproduct of quotients of $\hom$-functors modulo groups of automorphisms
- Concepts: weak wide pullbacks', 'coproduct', 'quotients', '$\hom$-functors', 'groups of automorphisms'

- Text: For finitary functors this was proved by Andr\'e Joyal who called these functors analytic
- Concepts: finitary functors', 'analytic'

- Text: We introduce a generalization of Joyal's concept from endofunctors of Set to endofunctors of a symmetric monoidal category.
- Concepts: 'generalization', 'endofunctors', 'Set', 'symmetric monoidal category'

- Text: We present sufficient conditions under which effective descent morphisms in a quasivariety of universal algebras are the same as regular epimorphisms and examples for which they are the same as regular epimorphisms satisfying projectivity.
- Concepts: 'effective descent morphisms', 'quasivariety', 'universal algebras', 'regular epimorphisms', 'projectivity'

- Text: Recent investigations of lax algebras - in generalization of Barr's relational algebras -make an essential use of lax extensions of monad functors on Set to the category Rel(V) of sets and V-relations (where V is a unital quantale)
- Concepts: 'lax algebras', 'Barr's relational algebras', 'lax extensions', 'monad functors', 'Set', 'category', 'Rel(V)', 'sets', 'V-relations', 'unital quantale'

- Text: For a given monad there may be many such lax extensions, and different constructions appear in the literature
- Concepts: monad, lax extensions, constructions, literature

- Text: The aim of this article is to shed a unifying light on these lax extensions, and present a symptomatic situation in which distinct monads yield isomorphic categories of lax algebras.

- Concepts: 'article', 'unifying', 'lax extensions', 'symptomatic situation', 'monads', 'isomorphic categories', 'lax algebras'

- Text: We propose a convenient category for directed homotopy consisting of "directed" topological spaces generated by "directed" cubes
- Concepts: 'category', 'directed homotopy', 'topological space', 'cube'

- Text: Its main advantage is that, like the category of topological spaces generated by simplices suggested by J
- Concepts: 'category', 'topological spaces', 'simplices'

- Text: H
- Concepts: None, as there is no information provided in the context.

- Text: Smith, it is locally presentable.
- Concepts: 'locally presentable'

- Text: We introduce a notion of weakly Mal'cev category, and show that: (a) every internal reflexive graph in a weakly Mal'tsev category admits at most one multiplicative graph structure in the sense of Janelidze, and such a structure always makes it an internal category; (b) (unlike the special case of Mal'tsev categories) there are weakly Mal'tsev categories in which not every internal category is an internal groupoid

- Concepts: 'internal reflexive graph', 'weakly Mal'cev category', 'multiplicative graph structure', 'internal category', 'Mal'tsev categories', 'internal groupoid'

- Text: We also give a simplified characterization of internal groupoids among internal categories in this context.
- Concepts: 'internal groupoids', 'internal categories'

- Text: The theory of completion of T_0 objects in categories of affine objects over a given complete category developed by the second author is extended to the case of T_0 objects in categories of 2affine objects
- Concepts: 'completion', 'T_0 objects', 'categories', 'affine objects', 'complete category', '2affine objects'

- Text: In the paper the case of the category Set and target object the two-point set is studied in detail and an internal characterization of 2affine sets is provided.
- Concepts: 'category', 'Set', 'two-point set', 'internal characterization', '2affine sets'

- Text: In a recent paper, Daisuke Tambara defined two-sided actions on an endomodule (= endodistributor) of a monoidal V-category A
- Concepts: 'monoidal V-category', 'endomodule', 'endodistributor', 'two-sided actions'

- Text: When A is autonomous (= rigid = compact), he showed that the V-category (that we call Tamb(A)) of so-equipped endomodules (that we call Tambara modules) is equivalent to the monoidal centre Z[A,V] of the convolution monoidal V-category [A, V]
- Concepts: autonomous, rigid, compact, V-category, Tamb(A), endomodules, Tambara modules, monoidal centre, convolution monoidal V-category

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- Text: Our paper extends these ideas somewhat
- Concepts: None identified as the context does not mention any specific Math concepts.

- Text: For general A, we construct a promonoidal V-category DA (which we suggest should be called the double of A) with an equivalence of [DA, V] with Tamb(A)
- Concepts: promonoidal V-category', 'double', 'equivalence', 'Tamb(A)'

- Text: When A is closed, we define strong (respectively, left strong) Tambara modules and show that these constitute a V-category Tamb_s(A) (respectively, Tamb_{ls}(A)) which is equivalent to the centre (respectively, lax centre) of [A, V]
- Concepts: Tambara modules', 'V-category', 'centre', 'lax centre'

- Text: We construct localizations D_sA and D_{ls}A of DA such that there are equivalences of Tamb_s(A) with [D_sA, V] and of Tamb_{ls}(A) with [D_{ls}A, V]

- Concepts: localizations, DA, Tamb_s(A), D_sA, V, Tamb_{ls}(A), D_{ls}A

- Text: When A is autonomous, every Tambara module is strong; this implies an equivalence of Z[A, V] with [DA,V].
- Concepts: autonomous', 'Tambara module', 'strong', 'equivalence', 'Z[A, V', '[DA,V'

- Text: We prove that every small strongly connected category k has a full embedding preserving all limits existing in k into a category of unary universal algebras
- Concepts: 'small', 'strongly connected category', 'full embedding', 'preserving', 'limits', 'unary universal algebras'

- Text: The number of unary operations can be restricted to |mor k| in case when k has a terminal object and only preservation of limits over finitely many objects is desired
- Concepts: 'unary operations', 'terminal object', 'preservation of limits', 'finely many objects'

- Text: And all limits existing in such a category k are preserved by a full embedding of k into the category of all algebraic systems with |mor k| unary operation and one unary relation.
- Concepts: 'category', 'limits', 'embedding', 'algebraic systems', '|mor k|', 'unary operation', 'unary relation'

- Text: A protolocalisation of a regular category is a full reflective regular subcategory, whose reflection preserves pullbacks of regular epimorphisms along arbitrary morphisms

- Concepts: 'protolocalisation', 'regular category', 'full reflective regular subcategory', 'reflection', 'pullbacks', 'regular epimorphisms', 'arbitrary morphisms'

- Text: We devote special attention to the epireflective protolocalisations of an exact Mal'cev category; we characterise them in terms of a corresponding closure operator on equivalence relations
- Concepts: 'epireflective', 'protolocalisations', 'exact', 'Mal\'cev category', 'closure operator', 'equivalence relations'

- Text: We give some examples in algebra and in topos theory.
- Concepts: algebra', 'topos theory'

- Text: This paper revisits the authors' notion of a differential category from a different perspective
- Concepts: 'differential category', 'notion', 'perspective'

- Text: A differential category is an additive symmetric monoidal category with a comonad (a "coalgebra modality") and a differential combinator
- Concepts: 'differential category', 'additive', 'symmetric monoidal category', 'comonad', 'coalgebra modality', 'differential combinator'

- Text: The morphisms of a differential category should be thought of as the linear maps; the differentiable or smooth maps would then be morphisms of the coKleisli category

- Concepts: 'differential category', 'linear maps', 'differentiable maps', 'smooth maps', 'coKleisli category'

- Text: The purpose of the present paper is to directly axiomatize differentiable maps and thus to move the emphasis from the linear notion to structures resembling the coKleisli category
- Concepts: 'axiomatize', 'differentiable maps', 'linear notion', 'coKleisli category', 'structures'

- Text: The result is a setting with a more evident and intuitive relationship to the familiar notion of calculus on smooth maps
- Concepts: 'calculus', 'smooth maps'

- Text: Indeed a primary example is the category whose objects are Euclidean spaces and whose morphisms are smooth maps. A Cartesian differential category is a Cartesian left additive category which possesses a Cartesian differential operator
- Concepts: 'Cartesian differential category', 'Cartesian left additive category', 'Cartesian differential operator', 'Euclidean spaces', 'smooth maps'

- Text: The differential operator itself must satisfy a number of equations, which guarantee, in particular, that the differential of any map is `"linear" in a suitable sense. We present an analysis of the basic properties of Cartesian differential categories
- Concepts: 'differential operator', 'equations', 'differential of a map', 'linear', 'Cartesian differential categories'

- Text: We show that under modest and natural assumptions, the coKleisli category of a differential category is Cartesian differential
- Concepts: 'differential category', 'coKleisli category', 'Cartesian differential'

- Text: Finally we present a (sound and complete) term calculus for these categories which allows their structure to be analysed using essentially the same language one might use for traditional multi-variable calculus.
- Concepts: term calculus, categories, structure, multi-variable calculus

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- Text: Let M = (M, m, u) be a monad and let (MX, m) be the free M-algebra on the object X
- Concepts: 'monad', 'M-algebra', 'free M-algebra', 'object'

- Text: Consider an M-algebra (A, a), a retraction r : (MX, m) --> (A, a) and a section t : (A, a) --> (MX, m) of r
- Concepts: M-algebra', 'retraction', 'section'

- Text: The retract (A, a) is not free in general
- Concepts: retract, free

- Text: We observe that for many monads with a `combinatorial flavor' such a retract is not only a free algebra (MA_0, m), but it is also the case that the object A_0 of generators is determined in a canonical way by the section t

- Concepts: monads, free algebra, generators, canonical way, section

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- Text: We give a precise form of this property, prove a characterization, and discuss examples from combinatorics, universal algebra, convexity and topos theory.
- Concepts: 'property', 'characterization', 'combinatorics', 'universal algebra', 'convexity', 'topos theory'

- Text: Globular complexes were introduced by E
- Concepts: 'Globular complexes'

- Text: Goubault and the author to model higher dimensional automata
- Concepts: higher dimensional automata', 'modeling'

- Text: Globular complexes are topological spaces equipped with a globular decomposition which is the directed analogue of the cellular decomposition of a CW-complex
- Concepts: 'globular complexes', 'topological spaces', 'globular decomposition', 'directed analogue', 'cellular decomposition', 'CW-complex'

- Text: We prove that there exists a combinatorial model category such that the cellular objects are exactly the globular complexes and such that the homotopy category is equivalent to the homotopy category of flows

- Concepts: 'combinatorial model category', 'cellular objects', 'globular complexes', 'homotopy category', 'flows'

- Text: The underlying category of this model category is a variant of M
- Concepts: model category'

- Text: Grandis' notion of d-space over a topological space colimit generated by simplices
- Concepts: d-space, topological space, colimit, simplices

- Text: This result enables us to understand the relationship between the framework of flows and other works in directed algebraic topology using d-spaces
- Concepts: 'flows', 'directed algebraic topology', 'd-spaces'

- Text: It also enables us to prove that the underlying homotopy type functor of flows can be interpreted up to equivalences of categories as the total left derived functor of a left Quillen adjoint.
- Concepts: 'underlying homotopy type functor', 'flows', 'equivalences of categories', 'total left derived functor', 'left Quillen adjoint'

- Text: This article contains a review of categorifications of semisimple representations of various rings via abelian categories and exact endofunctors on them
- Concepts: 'categorifications', 'semisimple representations', 'rings', 'abelian categories', 'exact endofunctors'

- Text: A simple definition of an abelian categorification is presented and illustrated with several examples, including categorifications of various representations of the symmetric group and its Hecke algebra via highest weight categories of modules over the Lie algebra sl_n
- Concepts: 'abelian categorification', 'representations', 'symmetric group', 'Hecke algebra', 'highest weight categories', 'modules', 'Lie algebra', 'sl_n'

- Text: The review is intended to give non-experts in representation theory who are familiar with the topological aspects of categorification (lifting quantum link invariants to homology theories) an idea for the sort of categories that appear when link homology is extended to tangles.
- Concepts: 'representation theory', 'categorification', 'quantum link invariants', 'homology theories', 'categories', 'link homology', 'tangles'

- Text: We study convergent (terminating and confluent) presentations of n-categories
- Concepts: convergent presentations', 'terminating', 'confluent', 'n-categories'

- Text: Using the notion of polygraph (or computad), we introduce the homotopical property of finite derivation type for n-categories, generalising the one introduced by Squier for word rewriting systems

- Concepts: 'polygraph', 'computad', 'homotopical property', 'finite derivation type', 'n-categories', 'Squier', 'word rewriting systems'

- Text: We characterise this property by using the notion of critical branching
- Concepts: 'notion', 'critical branching'

- Text: In particular, we define sufficient conditions for an n-category to have finite derivation type
- Concepts: 'n-category', 'finite derivation type'

- Text: Through examples, we present several techniques based on derivations of 2-categories to study convergent presentations by 3-polygraphs.
- Concepts: 'derivations', '2-categories', 'convergent presentations', '3-polygraphs'

- Text: This paper introduces the notions of vector field and flow on a general differentiable stack
- Concepts: 'vector field', 'flow', 'differentiable stack'

- Text: Our main theorem states that the flow of a vector field on a compact proper differentiable stack exists and is unique up to a uniquely determined 2-cell
- Concepts: vector field, compact proper differentiable stack, flow, unique, 2-cell

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- Text: This extends the usual result on the existence and uniqueness of flows on a manifold as well as the author's existing results for orbifolds
- Concepts: 'existence', 'uniqueness', 'flows', 'manifold', 'orbifolds'

- Text: It sets the scene for a discussion of Morse Theory on a general proper stack and also paves the way for the categorification of other key aspects of differential geometry such as the tangent bundle and the Lie algebra of vector fields.
- Concepts: Morse theory, proper stack, categorification, differential geometry, tangent bundle, Lie algebra, vector fields

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- Text: With the representable T-categories, we form a connection between two concepts, both owed to A
- Concepts: 'representable T-categories'

- Text: Burroni : on the one hand, the one of T-category, and, on the other hand, the one of T-lax algebra
- Concepts: 'T-category', 'T-lax algebra'

- Text: Both of them generalise the concept of algebra on a monad T.
- Concepts: 'monad', 'algebra'

- Text: Let G be a non-finite profinite group and let $G-Sets_{df}$ be the canonical site of finite discrete G-sets
- Concepts: 'profinite group', 'canonical site', 'finite discrete', 'G-sets'

- Text: Then the category R^+_G, defined by Devinatz and Hopkins, is the category obtained by considering $G-Sets_{df}$ together with the profinite G-space G itself, with morphisms being continuous G-equivariant maps
- Concepts: 'category', 'R^+_G', 'Devinatz and Hopkins', '$G-Sets_{df}$', 'profinite G-space', 'morphisms', 'continuous', 'G-equivariant maps'

- Text: We show that R^+_G is a site when equipped with the pretopology of epimorphic covers
- Concepts: 'R^+_G', 'site', 'pretopology', 'epimorphic covers'

- Text: We point out that presheaves of spectra on R^+_G are an efficient way of organizing the data that is obtained by taking the homotopy fixed points of a continuous G-spectrum with respect to the open subgroups of G
- Concepts: 'presheaves', 'spectra', 'homotopy fixed points', 'continuous G-spectrum', 'open subgroups', 'G'

- Text: Additionally, utilizing the result that R^+_G is a site, we describe various model category structures on the category of presheaves of spectra on R^+_G and make some observations about them.
- Concepts: 'R^+_G', 'site', 'presheaves of spectra', 'model category structures'

- Text: The purpose of this paper is to extend the results of TAC Vol

- Concepts: None - the context does not mention any specific math concepts.

- Text: 20, No
- Concepts: No, 20 (no math concepts present in this context)

- Text: 15 from the case of abelian groups (Z-modules) to that of modules over a large class of not necessarily commutative rings.
- Concepts: abelian groups, Z-modules, modules, not necessarily commutative rings

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- Text: This paper continues the work of our previous papers, The cyclic spectrum of a Boolean flow TAC 10, 392-419 and Spectra of finitely generated Boolean flows TAC 16, 434-459
- Concepts: 'cyclic spectrum', 'Boolean flow', 'finitely generated Boolean flows', 'spectra'

- Text: We define eventually cyclic Boolean flows and the eventually cyclic spectrum of a Boolean flow
- Concepts: Boolean flows, eventually cyclic Boolean flows, spectrum, eventually cyclic spectrum

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- Text: We show that this spectrum, as well as the spectra defined in our earlier papers, extend to parametrized flows on Stone spaces and on compact Hausdorff space when symbolic dynamics is used
- Concepts: 'spectrum', 'parametrized flows', 'Stone spaces', 'compact Hausdorff space', 'symbolic dynamics'

- Text: An example shows that the cyclic spectrum for a parameterized flow is sometimes over a non-spatial locale.
- Concepts: 'cyclic spectrum', 'parameterized flow', 'non-spatial locale'

- Text: We axiomatically define (pre-)Hilbert categories
- Concepts: 'Hilbert categories', 'pre-Hilbert categories', 'axiomatically'

- Text: The axioms resemble those for monoidal Abelian categories with the addition of an involutive functor
- Concepts: 'axioms', 'monoidal Abelian categories', 'addition', 'involutive functor'

- Text: We then prove embedding theorems: any locally small pre-Hilbert category whose monoidal unit is a simple generator embeds (weakly) monoidally into the category of pre-Hilbert spaces and adjointable maps, preserving adjoint morphisms and all finite (co)limits
- Concepts: 'locally small', 'pre-Hilbert category', 'monoidal unit', 'simple generator', 'embedding theorems', 'weakly monoidally', 'pre-Hilbert spaces', 'adjointable maps', 'adjoint morphisms', 'finite (co)limits'

- Text: An intermediate result that is important in its own right is that the scalars in such a category necessarily form an involutive field
- Concepts: 'category', 'scalars', 'involutive field'

- Text: In case of a Hilbert category, the embedding extends to the category of Hilbert spaces and continuous linear maps
- Concepts: 'Hilbert category', 'embedding', 'category', 'Hilbert spaces', 'continuous linear maps'

- Text: The axioms for (pre-)Hilbert categories are weaker than the axioms found in other approaches to axiomatizing 2-Hilbert spaces
- Concepts: (pre-)Hilbert categories', 'axioms', '2-Hilbert spaces'

- Text: Neither enrichment nor a complex base field is presupposed
- Concepts: 'enrichment', 'complex base field'

- Text: A comparison to other approaches will be made in the introduction.
- Concepts: 'comparison', 'approaches'

- Text: Distributive laws between monads (triples) were defined by Jon Beck in the 1960s
- Concepts: 'monads', 'triples', 'distributive laws'

- Text: They were generalized to monads in 2-categories and noticed to be monads in a 2-category of monads
- Concepts: 'monads', '2-categories', '2-category of monads'

- Text: Mixed distributive laws are comonads in the 2-category of monads; if the comonad has a right adjoint monad, the mate of a mixed distributive law is an ordinary distributive law

- Concepts: 'monads', 'comonads', '2-category', 'mixed distributive laws', 'right adjoint', 'mate', 'ordinary distributive law'

- Text: Particular cases are the entwining operators between algebras and coalgebras
- Concepts: 'entwining operators', 'algebras', 'coalgebras'

- Text: Motivated by work on weak entwining operators, we define and study a weak notion of distributive law for monads
- Concepts: weak entwining operators, monads, distributive law

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- Text: In particular, each weak distributive law determines a wreath product monad (in the terminology of Lack and Street); this gives an advantage over the mixed case.
- Concepts: 'weak distributive law', 'wreath product monad', 'mixed case'

- Text: We introduce the notion of elementary Seely category as a notion of categorical model of Elementary Linear Logic (ELL) inspired from Seely's definition of models of Linear Logic (LL)
- Concepts: 'elementary Seely category', 'categorical model', 'Elementary Linear Logic', 'Seely's definition', 'models of Linear Logic'

- Text: In order to deal with additive connectives in ELL, we use the approach of Danos and Joinet
- Concepts: 'additive', 'connectives', 'ELL', 'Danos', 'Joinet'

- Text: From the categorical point of view, this requires us to go outside the usual interpretation of connectives by functors
- Concepts: 'categorical', 'connectives', 'functors'

- Text: The $!$ connective is decomposed into a pre-connective $\sharp$ which is interpreted by a whole family of functors (generated by $\id$, $\tens$ and $\with$)
- Concepts: connective, pre-connective, functors, id, tens, with

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- Text: As an application, we prove the stratified coherent model and the obsessional coherent model to be elementary Seely categories and thus models of ELL.
- Concepts: stratified coherent model, obsessional coherent model, elementary Seely categories, models, ELL

- Text: In this paper, we consider an enriched orthogonality for classes of spaces, with respect to groupoids, simplicial sets and spaces themselves
- Concepts: 'enriched orthogonality', 'groupoids', 'simplicial sets', 'spaces'

- Text: This point of view allows one to characterize homotopy equivalences, shape and strong shape equivalences
- Concepts: 'homotopy equivalences', 'shape', 'strong shape equivalences'

- Text: We show that there exists a class of spaces, properly containing ANR-spaces, for which shape and strong shape equivalences coincide

- Concepts: ANR-spaces', 'shape equivalences', 'strong shape equivalences'

- Text: For such a class of spaces homotopy orthogonality implies enriched orthogonality.
- Concepts: 'class of spaces', 'homotopy orthogonality', 'enriched orthogonality'

- Text: Higher Homotopy van Kampen Theorems allow some colimit calculations of certain homotopical invariants of glued spaces
- Concepts: 'Homotopy van Kampen Theorems', 'colimit', 'homotopical invariants', 'glued spaces'

- Text: One corollary is to describe homotopical excision in critical dimensions in terms of induced modules and crossed modules over groupoids
- Concepts: 'corollary', 'homotopical excision', 'critical dimensions', 'modules', 'crossed modules', 'groupoids'

- Text: This paper shows how fibred and cofibred categories give an overall context for discussing and computing such constructions, allowing one result to cover many cases
- Concepts: 'fibred categories', 'cofibred categories', 'computing constructions'

- Text: A useful general result is that the inclusion of a fibre of a fibred category preserves connected colimits
- Concepts: 'fibre', 'fibred category', 'connected colimits'

- Text: The main homotopical applications are to pairs of spaces with several base points; we also describe briefly applications to triads.
- Concepts: 'homotopical', 'pairs of spaces', 'base points', 'triads'

- Text: The state space of a machine admits the structure of time
- Concepts: 'state space', 'structure', 'time'

- Text: For example, the geometric realization of a precubical set, a generalization of an unlabeled asynchronous transition system, admits a ``local preorder'' encoding control flow
- Concepts: 'geometric realization', 'precubical set', 'unlabeled asynchronous transition system', 'local preorder', 'control flow'

- Text: In the case where time does not loop, the ``locally preordered'' state space splits into causally distinct components
- Concepts: 'locally preordered', 'state space', 'causally distinct components'

- Text: The set of such components often gives a computable invariant of machine behavior
- Concepts: 'computable invariant', 'machine behavior'

- Text: In the general case, no such meaningful partition could exist
- Concepts: 'general case', 'meaningful partition'

- Text: However, as we show in this note, the locally preordered geometric realization of a precubical set admits a ``locally monotone'' covering from a state space in which time does not loop
- Concepts: 'preordered', 'geometric realization', 'precubical set', 'locally monotone', 'covering', 'state space', 'time'

- Text: Thus we hope to extend geometric techniques in static program analysis to looping processes.
- Concepts: 'geometric techniques', 'static program analysis', 'looping processes'

- Text: Prior work towards the subject of higher-dimensional categories gives rise to several examples of a category over Cat to which the slice-category construction can be lifted universally
- Concepts: 'higher-dimensional categories', 'category', 'Cat', 'slice-category construction', 'lifted universally'

- Text: The present paper starts by supplying this last clause with a precise meaning
- Concepts: precise meaning'

- Text: It goes on to establish for any such category a certain embedding in a presheaf category, to describe the image, and hence to derive conditions collectively sufficient for that functor to be an equivalence
- Concepts: 'category', 'embedding', 'presheaf category', 'image', 'functor', 'equivalence'

- Text: These conditions are met in the foremost of the examples: the category of dendrotopic sets.
- Concepts: 'category', 'dendrotopic sets'

- Text: We continue our examination of absolute CR-epic spaces, or spaces with the property that any embedding induces an epimorphism, in the category of commutative rings, between their rings of continuous functions
- Concepts: 'absolute', 'CR-epic spaces', 'embedding', 'epimorphism', 'category', 'commutative rings', 'continuous functions'

- Text: We examine more closely the deleted plank construction, which generalizes the Dieudonne construction, and yields absolute CR-epic spaces which are not Lindelof
- Concepts: 'deleted plank construction', 'Dieudonne construction', 'absolute CR-epic spaces', 'Lindelof'

- Text: For the Lindelof case, an earlier paper has shown the usefulness of the countable neighbourhood property, CNP, and the Alster condition (where CNP means that the space is a

P-space in any compactification and the Alster condition says that any cover of the space by G_δ sets has a countable subcover, provided each compact subset can be covered by a finite subset.) In this paper, we find further properties of Lindelof CNP spaces and of Alster spaces, including constructions that preserve these properties and conditions equivalent to these properties

- Concepts: Lindelof, countable neighbourhood property, CNP, Alster condition, P-space, compactification, G_δ sets, countable subcover, compact subset, constructions, equivalent conditions

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- Text: We explore the outgrowths of such spaces and find several examples that answer open questions in our previous work.
- Concepts: 'outgrowths', 'spaces', 'examples', 'open questions'

- Text: In a triangulated closed symmetric monoidal category, there are natural dualities induced by the internal Hom
- Concepts: 'triangulated', 'closed', 'symmetric monoidal category', 'natural dualities', 'internal Hom'

- Text: Given a monoidal exact functor f^* between two such categories and adjoint couples (f^*,f_*), $(f_*,f^!)$, we establish the commutative diagrams necessary for f^* and f_* to respect certain dualities, for a projection formula to hold between them (as duality preserving exact functors) and for classical base change and composition formulas to hold when such duality preserving functors are composed

- Concepts: 'monoidal exact functor', 'adjoint couples', 'projection formula', 'dualities', 'base change', 'composition formulas'

- Text: This framework allows us to define push-forwards for Witt groups, for example.
- Concepts: 'framework', 'push-forwards', 'Witt groups'

- Text: We show that the (co)endomorphism algebra of a sufficiently separable ``fibre'' functor into $Vect_k$, for $k$ a field of characteristic 0, has the structure of what we call a ``unital'' von Neumann core in $Vect_k$
- Concepts: (co)endomorphism algebra', 'separable', 'fibre functor', 'field', 'characteristic 0', 'structure', 'unital von Neumann core', 'Vect_k'

- Text: For $Vect_k$, this particular notion of algebra is weaker than that of a Hopf algebra, although the corresponding concept in Set is again that of a group.
- Concepts: 'algebra', 'Hopf algebra', '$Vect_k$', 'group', 'Set'

- Text: We adapt the work of Power to describe general, not-necessarily composable, not-necessarily commutative 2-categorical pasting diagrams and their composable and commutative parts
- Concepts: '2-categorical', 'pasting diagrams', 'composable', 'commutative'

- Text: We provide a deformation theory for pasting diagrams valued in the 2-category of k-linear categories, paralleling that provided for diagrams of algebras by Gerstenhaber and Schack, proving the standard results
- Concepts: 'deformation theory', 'pasting diagrams', '2-category', 'k-linear categories', 'algebras', 'Gerstenhaber', 'Schack', 'standard results'

- Text: Along the way, the construction gives rise to a bicategorical analog of the homotopy G-algebras of Gerstenhaber and Voronov.
- Concepts: 'construction', 'bicategorical', 'homotopy G-algebras', 'Gerstenhaber', 'Voronov'

- Text: Sifted colimits, important for algebraic theories, are "almost" just the combination of filtered colimits and reflexive coequalizers
- Concepts: 'sifted colimits', 'algebraic theories', 'filtered colimits', 'reflexive coequalizers'

- Text: For example, given a finitely cocomplete category $\cal A$, then a functor with domain $\cal A$ preserves sifted colimits iff it preserves filtered colimits and reflexive coequalizers
- Concepts: 'finitely cocomplete category', 'functor', 'sifted colimits', 'filtered colimits', 'reflexive coequalizers'

- Text: But for general categories $\cal A$ that statement is not true: we provide a counter-example.

- Concepts: 'categories', 'counter-example'

- Text: The notion of a subtractive category recently introduced by the author, is a pointed categorical counterpart of the notion of a subtractive variety of universal algebras in the sense of A.~Ursini (recall that a variety is subtractive if its theory contains a constant 0 and a binary term s satisfying s(x,x)=0 and s(x,0)=x)
- Concepts: 'subtractive category', 'categorical counterpart', 'subtractive variety', 'universal algebras', 'binary term', 'constant 0'

- Text: Let us call a pointed regular category $\mathbb{C}$ normal if every regular epimorphism in $\mathbb{C}$ is a normal epimorphism
- Concepts: 'pointed regular category', 'normal', 'regular epimorphism', 'normal epimorphism'

- Text: It is well known that any homological category in the sense of F
- Concepts: 'homological category'

- Text: Borceux and D
- Concepts: None provided, as the context does not contain any clear references to math concepts.

- Text: Bourn is both normal and subtractive
- Concepts: 'normal', 'subtractive'

- Text: We prove that in any subtractive normal category, the upper and lower 3×3 lemmas hold true, which generalizes a similar result for homological categories due to D
- Concepts: 'subtractive normal category', '3×3 lemmas', 'homological categories'

- Text: Bourn (note that the middle 3×3 lemma holds true if and only if the category is homological)
- Concepts: 'middle $3\\times 3$ lemma', 'homological', 'category'

- Text: The technique of proof is new: the pointed subobject functor $\mathcal{S}=\mathrm{Sub}(-):\mathbb{C}\rightarrow\mathbf{Set}_*$ turns out to have suitable preservation/reflection properties which allow us to reduce the proofs of these two diagram lemmas to the standard diagram-chasing arguments in $\mathbf{Set}_*$ (alternatively, we could use the more advanced embedding theorem for regular categories due to M.~Barr)
- Concepts: subobject functor, preservation, reflection properties, reduced proofs, diagram lemmas, diagram-chasing arguments, embedding theorem, regular categories

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- Text: The key property of $\mathcal{S}$, which allows to obtain these diagram lemmas, is the preservation of subtractive spans
- Concepts: 'mathcal{S}', 'diagram lemmas', 'subtractive spans', 'preservation'

- Text: Subtractivity of a span provides a weaker version of the rule of subtraction --- one of the elementary rules for chasing diagrams in abelian categories, in the sense of S
- Concepts: 'subtractivity', 'span', 'rule of subtraction', 'elementary rules', 'chasing diagrams', 'abelian categories'

- Text: Mac Lane
- Concepts: Unfortunately, there are no specific math concepts mentioned in this context as "Mac Lane" could refer to various concepts, such as the mathematician Saunders Mac Lane or the Mac Lane cohomology theory. More context would be needed to identify specific math concepts.

- Text: A pointed regular category is subtractive if and only if every span in it is subtractive, and moreover, the functor $\mathcal{S}$ not only preserves but also reflects subtractive spans
- Concepts: 'pointed', 'regular category', 'subtractive', 'span', 'functor', 'preserves', 'reflects'

- Text: Thus, subtractivity seems to be exactly what we need in order to prove the upper/lower 3×3 lemmas in a normal category
- Concepts: 'subtractivity', '3×3 lemmas', 'normal category'

- Text: Indeed, we show that a normal category is subtractive if and only if these 3×3 lemmas hold true in it
- Concepts: 'normal category', 'subtractive', '3×3 lemmas'

- Text: Moreover, we show that for any pointed regular category $\mathbb{C}$ (not necessarily a normal one), we have: $\mathbb{C}$ is subtractive if and only if the lower 3×3 lemma holds true in $\mathbb{C}$.
- Concepts: 'pointed regular category', 'subtractive', 'lower 3×3 lemma'

- Text: The metric jets, introduced here, generalize the jets (at order one) of Charles Ehresmann
- Concepts: 'metric jets', 'jets', 'order one', 'Charles Ehresmann'

- Text: In short, for a ``good'' map f (said to be ``tangentiable'' at a) between metric spaces, we define its metric jet tangent at a (composed of all the maps which are locally lipschitzian at a and tangent to f at a) called the ``tangential'' of f at a, and denoted Tf_a
- Concepts: 'metric spaces', 'tangentiable', 'metric jet tangent', 'locally lipschitzian', 'tangent to f at a'

- Text: So, in this metric context, we define a ``new differentiability'' (called ``tangentiability'') which extends the classical differentiability (while preserving most of its properties) to new maps, traditionally pathologic.
- Concepts: metric context', 'differentiability', 'tangentiability', 'classical differentiability', 'maps', 'pathologic'

- Text: Protomodularity, in the pointed case, is equivalent to the Split Short Five Lemma

- Concepts: 'protomodularity', 'pointed case', 'split short five lemma'

- Text: It is also well known that this condition implies that every internal category is in fact an internal groupoid
- Concepts: 'internal category', 'internal groupoid'

- Text: In this work, this is condition (II) and we introduce two other conditions denoted (I) and (III)
- Concepts: 'condition (II)', 'conditions (I and III)'

- Text: Under condition (I), every multiplicative graph is an internal category
- Concepts: 'multiplicative graph', 'internal category'

- Text: Under condition (III), every star-multiplicative graph can be extended (uniquely) to a multiplicative graph, a problem raised by G
- Concepts: 'multiplicative graph', 'star-multiplicative graph', 'condition (III)'

- Text: Janelidze in the semiabelian context. When the three conditions hold, internal groupoids have a simple description, that, in the semiabelian context, correspond to the notion of internal crossed module, in the sense of Janelidze.
- Concepts: 'semiabelian context', 'internal groupoids', 'internal crossed module', 'Janelidze'

- Text: We characterise the double central extensions in a semi-abelian category in terms of commutator conditions
- Concepts: 'double central extensions', 'semi-abelian category', 'commutator conditions'

- Text: We prove that the third cohomology group H^3(Z,A) of an object Z with coefficients in an abelian object A classifies the double central extensions of Z by A.
- Concepts: cohomology group, third cohomology group, object, abelian object, double central extensions

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- Text: We clarify the relationship between separable and covering morphisms in general categories by introducing and studying an intermediate class of morphisms that we call strongly separable.
- Concepts: 'separable morphisms', 'covering morphisms', 'general categories', 'strongly separable morphisms'

- Text: The purpose of this paper is to prove a new, incomplete-relative, version of Non-abelian Snake Lemma, where "relative" refers to a distinguished class of normal epimorphisms in the ground category, and "incomplete" refers to omitting all completeness/cocompleteness assumptions not involving that class.
- Concepts: 'paper', 'prove', 'new', 'incomplete-relative', 'Non-abelian Snake Lemma', 'relative', 'normal epimorphisms', 'ground category', 'incomplete', 'completeness', 'cocompleteness'

- Text: In this paper we show that in a homological category in the sense of F
- Concepts: 'homological category'

- Text: Borceux and D
- Concepts: None provided. Context is incomplete.

- Text: Bourn, the notion of an internal precrossed module corresponding to a star-multiplicative graph, in the sense of G
- Concepts: 'internal precrossed module', 'star-multiplicative graph'

- Text: Janelidze, can be obtained by directly internalizing the usual axioms of a crossed module, via equivariance
- Concepts: 'internalizing', 'axioms', 'crossed module', 'equivariance'

- Text: We then exhibit some sufficient conditions on a homological category under which this notion coincides with the notion of an internal crossed module due to G
- Concepts: 'homological category', 'internal crossed module'

- Text: Janelidze
- Concepts: There are no math concepts mentioned in this context.

- Text: We show that this is the case for any category of distributive Ω_2-groups, in particular for the categories of groups with operations in the sense of G

- Concepts: 'category', 'distributive', 'Ω_2-groups', 'categories of groups', 'operations', 'G'

- Text: Orzech.
- Concepts: There are no math concepts mentioned in this context.

- Text: We describe a simplified categorical approach to Galois descent theory
- Concepts: 'categorical approach', 'Galois descent theory'

- Text: It is well known that Galois descent is a special case of Grothendieck descent, and that under mild additional conditions the category of Grothendieck descent data coincides with the Eilenberg-Moore category of algebras over a suitable monad
- Concepts: 'Galois descent', 'Grothendieck descent', 'category', 'Eilenberg-Moore category', 'algebras', 'monad'

- Text: This also suggests using monads directly, and our monadic approach to Galois descent makes no reference to Grothendieck descent theory at all
- Concepts: 'monads', 'monadic approach', 'Galois descent', 'Grothendieck descent theory'

- Text: In order to make Galois descent constructions perfectly clear, we also describe their connections with some other related constructions of categorical algebra, and make various explicit calculations, especially with 1-cocycles and 1-dimensional non-abelian cohomology, usually omitted in the literature.

- Concepts: 'Galois descent constructions', 'categorical algebra', '1-cocycles', '1-dimensional non-abelian cohomology'

- Text: This is an expanded, revised and corrected version of the first author's 1981 preprint
- Concepts: None (there are no math concepts mentioned in this context)

- Text: The discussion of one-dimensional cohomology H^{1} in a fairly general category E involves passing to the 2-category Cat(E) of categories E
- Concepts: 'cohomology', 'category', '2-category'

- Text: In particular, the coefficient object is a category B in E and the torsors that H^{1} classifies are particular functors in E
- Concepts: 'category', 'torsors', 'H^{1}', 'functors'

- Text: We only impose conditions on E that are satisfied also by Cat(E) and argue that H^{1} for Cat(E) is a kind of H^{2} for E, and so on recursively
- Concepts: 'conditions', 'Cat(E)', 'H^{1}', 'kind', 'H^{2}', 'recursively'

- Text: For us, it is too much to ask E to be a topos (or even internally complete) since, even if E is, Cat(E) is not
- Concepts: 'topos', 'internally complete', 'Cat(E)'

- Text: With this motivation, we are led to examine morphisms in E which act as internal families and to internalize the comprehensive factorization of functors into a final functor followed by a discrete fibration
- Concepts: 'morphisms', 'internal families', 'internalize', 'comprehensive factorization', 'functors', 'final functor', 'discrete fibration'

- Text: We define B-torsors for a category B in E and prove clutching and classification theorems
- Concepts: B-torsors', 'category', 'clutching theorem', 'classification theorem'

- Text: The former theorem clutches Cech cocycles to construct torsors while the latter constructs a coefficient category to classify structures locally isomorphic to members of a given internal family of structures
- Concepts: 'theorem', 'Cech cocycles', 'construct torsors', 'coefficient category', 'classify structures', 'internal family of structures'

- Text: We conclude with applications to examples.
- Concepts: 'applications', 'examples'

- Text: Any semi-abelian category A appears, via the discrete functor, as a full replete reflective subcategory of the semi-abelian category of internal groupoids in A

- Concepts: 'semi-abelian category', 'discrete functor', 'internal groupoids'

- Text: This allows one to study the homology of n-fold internal groupoids with coefficients in a semi-abelian category A, and to compute explicit higher Hopf formulae
- Concepts: 'homology', 'internal groupoids', 'semi-abelian category', 'higher Hopf formulae', 'coefficients'

- Text: The crucial concept making such computations possible is the notion of protoadditive functor, which can be seen as a natural generalisation of the notion of additive functor.
- Concepts: 'protoadditive functor', 'additive functor', 'generalisation'

- Text: We present a general treatment of measures and integrals in certain (monoidal closed) categories
- Concepts: measures', 'integrals', 'monoidal closed categories'

- Text: Under appropriate conditions the integral can be defined by a universal property, and the universal measure is at the same time a universal multiplicative measure
- Concepts: 'integral', 'universal property', 'universal measure', 'multiplicative measure'

- Text: In the multiplicative case this assignment is right adjoint to the formation of the Boolean algebra of idempotents

- Concepts: 'multiplicative case', 'right adjoint', 'Boolean algebra', 'idempotents'

- Text: Now coproduct preservation yields an approach to product measures.
- Concepts: 'coproduct preservation', 'approach', 'product measures'

- Text: The 2-category of constructively completely distributive lattices is shown to be bidual to a 2-category of generalized orders that admits a monadic schizophrenic object biadjunction over the 2-category of ordered sets.
- Concepts: 2-category, completely distributive lattice, bidual, generalized order, monadic, schizophrenic object, biadjunction, ordered sets

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- Text: We show that categories weakly enriched over symmetric monoidal categories can be strictified to categories enriched in permutative categories
- Concepts: 'categories', 'weakly enriched', 'symmetric monoidal categories', 'strictified', 'enriched', 'permutative categories'

- Text: This is a "many 0-cells" version of the strictification of bimonoidal categories to strict ones.
- Concepts: 'bimonoidal categories', 'strictification', '0-cells'

- Text: We prove that every category of interest (in the sense of G
- Concepts: 'category', 'G'

- Text: Orzech) is action accessible in the sense of Bourn and Janelidze
- Concepts: 'action accessible', 'Bourn', 'Janelidze'

- Text: This fact allows us to give an intrinsic description of centers and centralizers in this class of categories
- Concepts: 'intrinsic description', 'centers', 'centralizers', 'categories'

- Text: We give also some new examples of categories of interest, mainly arising from Loday's papers.
- Concepts: 'categories', 'Loday'

- Text: Notions of generalized multicategory have been defined in numerous contexts throughout the literature, and include such diverse examples as symmetric multicategories, globular operads, Lawvere theories, and topological spaces
- Concepts: 'generalized multicategory', 'symmetric multicategories', 'globular operads', 'Lawvere theories', 'topological spaces'

- Text: In each case, generalized multicategories are defined as the ``lax algebras'' or ``Kleisli monoids'' relative to a ``monad'' on a bicategory
- Concepts: 'multicategories', 'lax algebras', 'Kleisli monoids', 'monad', 'bicategory'

- Text: However, the meanings of these words differ from author to author, as do the specific bicategories considered
- Concepts: bicategories'

- Text: We propose a unified framework: by working with monads on double categories and related structures (rather than bicategories), one can define generalized multicategories in a way that unifies all previous examples, while at the same time simplifying and clarifying much of the theory.
- Concepts: monads, double categories, bicategories, generalized multicategories, theory

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- Text: Groupoidification is a form of categorification in which vector spaces are replaced by groupoids and linear operators are replaced by spans of groupoids
- Concepts: 'groupoidification', 'categorification', 'vector spaces', 'groupoids', 'linear operators', 'spans'

- Text: We introduce this idea with a detailed exposition of `degroupoidification': a systematic process that turns groupoids and spans into vector spaces and linear operators
- Concepts: 'degroupoidification', 'groupoids', 'spans', 'vector spaces', 'linear operators'

- Text: Then we present three applications of groupoidification
- Concepts: 'groupoidification', 'applications', 'groupoid'

- Text: The first is to Feynman diagrams

- Concepts: 'Feynman diagrams'

- Text: The Hilbert space for the quantum harmonic oscillator arises naturally from degroupoidifying the groupoid of finite sets and bijections
- Concepts: 'Hilbert space', 'quantum harmonic oscillator', 'groupoid', 'finite sets', 'bijections', 'degroupoidifying'

- Text: This allows for a purely combinatorial interpretation of creation and annihilation operators, their commutation relations, field operators, their normal-ordered powers, and finally Feynman diagrams
- Concepts: 'combinatorial interpretation', 'creation operators', 'annihilation operators', 'commutation relations', 'field operators', 'normal-ordered powers', 'Feynman diagrams'

- Text: The second application is to Hecke algebras
- Concepts: 'Hecke algebras'

- Text: We explain how to groupoidify the Hecke algebra associated to a Dynkin diagram whenever the deformation parameter q is a prime power
- Concepts: 'groupoidify', 'Hecke algebra', 'Dynkin diagram', 'deformation parameter', 'prime power'

- Text: We illustrate this with the simplest nontrivial example, coming from the A_2 Dynkin diagram
- Concepts: 'Dynkin diagram', 'A_2'

- Text: In this example we show that the solution of the Yang--Baxter equation built into the A_2 Hecke algebra arises naturally from the axioms of projective geometry applied to the projective plane over the finite field $\mathbb{F}_q$
- Concepts: 'Yang-Baxter equation', 'A_2 Hecke algebra', 'projective geometry', 'projective plane', 'finite field', '$\mathbb{F}_q$'

- Text: The third application is to Hall algebras
- Concepts: Hall algebras'

- Text: We explain how the standard construction of the Hall algebra from the category of $\mathbb{F}_q$ representations of a simply-laced quiver can be seen as an example of degroupoidification
- Concepts: Hall algebra', 'category', 'representations', '$\mathbb{F}_q$', 'simply-laced quiver', 'degroupoidification'

- Text: This in turn provides a new way to categorify - or more precisely, groupoidify - the positive part of the quantum group associated to the quiver.
- Concepts: 'categorify', 'groupoidify', 'positive part', 'quantum group', 'quiver'

- Text: We clarify the relationship between internal profunctors and connectors on pairs (R,S) of equivalence relations which originally appeared in our new profunctorial approach of the Schreier-Mac Lane extension theorem

- Concepts: 'internal profunctors', 'connectors', 'equivalence relations', 'profunctorial approach', 'Schreier-Mac Lane extension theorem'

- Text: This clarification allows us to extend this Schreier-Mac Lane theorem to any exact Mal'cev category with centralizers
- Concepts: 'Schreier-Mac Lane theorem', 'exact category', 'Mal'cev category', 'centralizers'

- Text: On the other hand, still in the Mal'cev context and in respect to the categorical Galois theory associated with a reflection I, it allows us to produce the faithful action of a certain abelian group on the set of classes (up to isomorphism) of I-normal extensions having a given Galois groupoid.
- Concepts: 'Mal'cev context', 'categorical Galois theory', 'reflection', 'faithful action', 'abelian group', 'classes', 'isomorphism', 'I-normal extensions', 'Galois groupoid'

- Text: A combinatorial category Disk was introduced by André Joyal to play a role in his definition of weak ω-category
- Concepts: 'combinatorial category', 'Disk', 'definition', 'weak ω-category'

- Text: He defined the category Θ to be dual to Disk
- Concepts: 'category', 'dual', 'Disk'

- Text: In the ensuing literature, a more concrete description of Θ was provided

- Concepts: None - this context does not contain any specific mathematical concepts or terms.

- Text: In this paper we provide another proof of the dual equivalence and introduce various categories equivalent to Disk or Θ, each providing a helpful viewpoint.
- Concepts: 'proof', 'dual equivalence', 'categories', 'Disk', 'Θ', 'viewpoint'

- Text: We present two generalizations of the Span construction
- Concepts: 'Span construction', 'generalizations'

- Text: The first generalization gives Span of a category with all pullbacks as a (weak) double category
- Concepts: 'pullbacks', 'category', 'double category', 'weak double category'

- Text: This double category Span A can be viewed as the free double category on the vertical category A where every vertical arrow has both a companion and a conjoint (and these companions and conjoints are adjoint to each other)
- Concepts: 'double category', 'free double category', 'vertical category', 'companion', 'conjoint', 'adjoint'

- Text: Thus defined, Span : Cat --> Doub becomes a 2-functor, which is a partial left bi-adjoint to the forgetful functor Vrt : Doub --> Cat, which sends a double category to its category of vertical arrows. The second generalization gives Span of an arbitrary

category as an oplax normal double category
- Concepts: Span, Cat, Doub, 2-functor, partial left bi-adjoint, forgetful functor, Vrt, double category, category of vertical arrows, oplax normal double category

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- Text: The universal property can again be given in terms of companions and conjoints and the presence of their composites
- Concepts: 'universal property', 'companions', 'conjoints', 'composites'

- Text: Moreover, Span A is universal with this property in the sense that Span : Cat --> OplaxNDoub is left bi-adjoint to the forgetful functor which sends an oplax double category to its vertical arrow category.
- Concepts: Span, universal, property, Cat, OplaxNDoub, left bi-adjoint, forgetful functor, oplax double category, vertical arrow category

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- Text: We present a doctrinal approach to category theory, obtained by abstracting from the indexed inclusion (via discrete fibrations and opfibrations) of left and of right actions of X in Cat in categories over X
- Concepts: 'category theory', 'indexed inclusion', 'discrete fibrations', 'opfibrations', 'left actions', 'right actions', 'categories over X'

- Text: Namely, a ``weak temporal doctrine'' consists essentially of two indexed functors with the same codomain such that the induced functors have both left and right adjoints satisfying some exactness conditions, in the spirit of categorical logic. The derived logical rules include some adjunction-like laws involving the truth-values-enriched hom and tensor functors, which condense several basic categorical properties and display a nice symmetry

- Concepts: 'indexed functors', 'left adjoints', 'right adjoints', 'exactness conditions', 'categorical logic', 'truth-values-enriched hom functor', 'tensor functor', 'adjunction-like laws', 'symmetry'

- Text: The symmetry becomes more apparent in the slightly stronger context of ``temporal doctrines'', which we initially treat and which include as an instance the inclusion of lower and upper sets in the parts of a poset, as well as the inclusion of left and right actions of a graph in the graphs over it.
- Concepts: 'poset', 'lower sets', 'upper sets', 'left actions', 'right actions', 'graph'

- Text: Let R be a commutative ring whose complete ring of quotients is R-injective
- Concepts: 'commutative ring', 'complete ring of quotients', 'R-injective'

- Text: We show that the category of topological R-modules contains a full subcategory that is *-autonomous using R itself as dualizing object
- Concepts: 'category', 'topological R-modules', 'full subcategory', '*-autonomous', 'dualizing object'

- Text: In order to do this, we develop a new variation on the category chu(D,R), where D is the category of discrete R-modules: the high wide subcategory, which we show equivalent to the category of reflexive topological modules.
- Concepts: 'category', 'discrete R-modules', 'high wide subcategory', 'reflexive topological modules'

- Text: Deterministic automata are algebras of the monad T_M associated to a free monoid M
- Concepts: 'deterministic automata', 'algebras', 'monad', 'free monoid'

- Text: To extend to nondeterministic and stochastic automata such a monadic formalism, it is suitable to resort to a notion richer than the one of monad, but equally basic: the notion of distributive law between two monads
- Concepts: 'nondeterministic automata', 'stochastic automata', 'monadic formalism', 'notion of monad', 'distributive law'

- Text: The notion of algebra on a monad is then generalized by the one of algebra for a distributive law
- Concepts: 'monad', 'algebra', 'distributive law', 'generalized'

- Text: The nondeterministic and stochastic automata are precisely algebras for distributive laws whose first monad is T_M
- Concepts: 'nondeterministic automata', 'stochastic automata', 'algebras for distributive laws', 'first monad', 'T_M'

- Text: If the nondeterministic case involves a distributive law between T_M and the well-known power set monad, the stochastic case involves a distributive law between T_M (where, here, M is a measurable monoid) and the probability monad
- Concepts: 'distributive law', 'power set monad', 'measurable monoid', 'probability monad', 'stochastic case', 'nondeterministic case'

- Text: This allows presentation of the stochastic automata as algebras for this distributive law
- Concepts: 'stochastic automata', 'algebras', 'distributive law'

- Text: This paper taking place at the confluence of category, automata and probability theories, we have, for the convenience of the reader not aware of each area, made useful reviews about these subjects (in several appendices)
- Concepts: 'category', 'automata', 'probability theories', 'reviews', 'appendices'

- Text: We also recall the detailed construction of the probability monad; and we construct precisely the distributive law which links it to the monad T_M.
- Concepts: 'probability monad', 'distributive law', 'monad'

- Text: An alternative description of the tensor product of sup-lattices is given with yet another description provided for the tensor product in the special case of CCD sup-lattices

- Concepts: 'tensor product', 'sup-lattices', 'CCD sup-lattices', 'special case'

- Text: In the course of developing the latter, properties of sup-preserving functions and the totally below relation are generalized to not-necessarily-complete ordered sets.
- Concepts: 'sup-preserving functions', 'totally below relation', 'ordered sets'

- Text: An unpublished result by the first author states that there exists a Hopf algebra H such that for any Möbius category $\cal C$ (in the sense of Leroux) there exists a canonical algebra morphism from the dual H^* of H to the incidence algebra of $\cal C$
- Concepts: 'Hopf algebra', 'Möbius category', 'canonical algebra morphism', 'dual', 'incidence algebra'

- Text: Moreover, the Möbius inversion principle in incidence algebras follows from a `master' inversion result in H^*
- Concepts: 'Möbius inversion principle', 'incidence algebras', 'master inversion result', 'H^*'

- Text: The underlying module of H was originally defined as the free module on the set of iso classes of Möbius intervals, i.e
- Concepts: 'underlying module', 'free module', 'set', 'iso classes', 'Möbius intervals'

- Text: Möbius categories with initial and terminal objects

- Concepts: 'Möbius categories', 'initial object', 'terminal object'

- Text: Here we consider a category of Möbius intervals and construct the Hopf algebra via the objective approach applied to a monoidal extensive category of combinatorial objects, with the values in appropriate rings being abstracted from combinatorial functors on the objects
- Concepts: 'category', 'Möbius intervals', 'Hopf algebra', 'monoidal extensive category', 'combinatorial objects', 'abstracted', 'combinatorial functors'

- Text: The explicit consideration of a category of Möbius intervals leads also to two new characterizations of Möbius categories.
- Concepts: 'category', 'Möbius intervals', 'characterizations', 'Möbius categories'

- Text: Let $\cal K$ be a locally finitely presentable category
- Concepts: 'locally finitely presentable category'

- Text: If $\cal K$ is abelian and the sequence $$ 0 \to K \to^k X \to^c C \to 0$$ is short exact, we show that 1) K is finitely generated iff c is finitely presentable; 2) k is finitely presentable iff C is finitely presentable
- Concepts: 'abelian', 'short exact sequence', 'finitely generated', 'finitely presentable'

- Text: The ``if'' directions fail for semi-abelian varieties
- Concepts: semi-abelian varieties'

- Text: We show that all but (possibly) 2)(if) follow from analogous properties which hold in all locally finitely presentable categories
- Concepts: 'locally finitely presentable categories'

- Text: As for 2)(if), it holds as soon as $\cal K$ is also co-homological, and all its strong epimorphisms are regular
- Concepts: co-homological, strong epimorphisms, regular

- Text: Finally, locally finitely coherent (resp
- Concepts: 'locally finitely coherent'

- Text: noetherian) abelian categories are characterized as those for which all finitely presentable morphisms have finitely generated (resp
- Concepts: 'noetherian', 'abelian categories', 'finitely presentable', 'finitely generated'

- Text: presentable) kernel objects.
- Concepts: 'presentable', 'kernel objects'

- Text: Variations on the notions of Reedy model structures and projective model structures on categories of diagrams in a model category are introduced
- Concepts: 'Reedy model structures', 'projective model structures', 'categories of diagrams', 'model category'

- Text: These allow one to choose only a subset of the entries when defining weak equivalences, or to use different model categories at different entries of the diagrams

- Concepts: 'weak equivalences', 'model categories', 'entries', 'diagrams'

- Text: As a result, a bisimplicial model category that can be used to recover the algebraic K-theory for any Waldhausen subcategory of a model category is produced.
- Concepts: 'bisimplicial', 'model category', 'algebraic K-theory', 'Waldhausen subcategory'

- Text: Implementing an idea due to John Baez and James Dolan we define new invariants of Whitney stratified manifolds by considering the homotopy theory of smooth transversal maps
- Concepts: 'homotopy theory', 'Whitney stratified manifold', 'smooth transversal maps', 'invariants'

- Text: To each Whitney stratified manifold we assign transversal homotopy monoids, one for each natural number
- Concepts: 'Whitney stratified manifold', 'transversal homotopy monoids', 'natural number'

- Text: The assignment is functorial for a natural class of maps which we call stratified normal submersions
- Concepts: functorial, natural class of maps, stratified normal submersions

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- Text: When the stratification is trivial the transversal homotopy monoids are isomorphic to the usual homotopy groups

- Concepts: 'stratification', 'transversal homotopy monoids', 'homotopy groups'

- Text: We compute some simple examples and explore the elementary properties of these invariants
- Concepts: 'compute', 'examples', 'elementary properties', 'invariants'

- Text: We also assign `higher invariants', the transversal homotopy categories, to each Whitney stratified manifold
- Concepts: 'higher invariants', 'transversal homotopy categories', 'Whitney stratified manifold'

- Text: These have a rich structure; they are rigid monoidal categories for n > 1 and ribbon categories for n > 2
- Concepts: 'rigid monoidal categories', 'ribbon categories'

- Text: As an example we show that the transversal homotopy categories of a sphere, stratified by a point and its complement, are equivalent to categories of framed tangles.
- Concepts: 'transversal homotopy categories', 'sphere', 'stratified', 'point', 'complement', 'equivalent', 'categories', 'framed tangles'

- Text: We define the notion of a torsor for an inverse semigroup, which is based on semigroup actions, and prove that this is precisely the structure classified by the topos associated with an inverse semigroup

- Concepts: 'torsor', 'inverse semigroup', 'semigroup actions', 'topos'

- Text: Unlike in the group case, not all set-theoretic torsors are isomorphic: we shall give a complete description of the category of torsors
- Concepts: 'set-theoretic torsors', 'isomorphic', 'category of torsors'

- Text: We explain how a semigroup prehomomorphism gives rise to an adjunction between a restrictions-of-scalars functor and a tensor product functor, which we relate to the theory of covering spaces and E-unitary semigroups
- Concepts: 'semigroup', 'prehomomorphism', 'adjunction', 'restrictions-of-scalars functor', 'tensor product functor', 'covering spaces', 'E-unitary semigroups'

- Text: We also interpret for semigroups the Lawvere-product of a sheaf and distributio$ and finally, we indicate how the theory might be extended to general semigroups, by defining a notion of torsor and a classifying topos for those.
- Concepts: 'semigroups', 'Lawvere-product', 'sheaf', 'distribution', 'general semigroups', 'torsor', 'classifying topos'

- Text: We show that the class of weak equivalences of a combinatorial model category can be detected by an accessible functor into simplicial sets.

- Concepts: 'weak equivalences', 'combinatorial model category', 'accessible functor', 'simplicial sets'

- Text: We introduce a description of the algebras for a monad in terms of extension systems, similar to the one for monads given by Manes
- Concepts: 'monad', 'algebras', 'extension systems'

- Text: We rewrite distributive laws for monads and wreaths in terms of this description, avoiding the iteration of the functors involved
- Concepts: 'distributive laws', 'monads', 'wreaths', 'functors'

- Text: We give a profunctorial explanation of why Manes' description of monads in terms of extension systems works.
- Concepts: profunctorial, Manes' description, monads, extension systems

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- Text: We generalize to the context internal to an autonomous monoidal bicategory the work of Bruguieres, Virelizier, and the second-named author on lifting closed structure on a monoidal category to the category of Eilenberg-Moore algebras for an opmonoidal monad
- Concepts: 'monoidal bicategory', 'closed structure', 'monoidal category', 'Eilenberg-Moore algebras', 'opmonoidal monad', 'lifting'

- Text: The result then applies to quantum categories and bialgebroids.

- Concepts: 'quantum categories', 'bialgebroids'

- Text: The notion of Frobenius algebra originally arose in ring theory, but it is a fairly easy observation that this notion can be extended to arbitrary monoidal categories
- Concepts: 'Frobenius algebra', 'ring theory', 'monoidal categories'

- Text: But, is this really the correct level of generalisation? For example, when studying Frobenius algebras in the *-autonomous category $\Sup$, the standard concept using only the usual tensor product is less interesting than a similar one in which both the usual tensor product and its de Morgan dual (par) are used
- Concepts: 'Frobenius algebras', '*-autonomous category', 'tensor product', 'de Morgan dual', 'par'

- Text: Thus we maintain that the notion of linear-distributive category (which has both a tensor and a par, but is nevertheless more general than the notion of monoidal category) provides the correct framework in which to interpret the concept of Frobenius algebra.
- Concepts: 'linear-distributive category', 'tensor', 'par', 'monoidal category', 'Frobenius algebra'

- Text: We explain in detail why the notion of list-arithmetic pretopos should be taken as the general categorical definition for the construction of arithmetic universes introduced by André Joyal to give a categorical proof of Gödel's incompleteness results.

- Concepts: 'list-arithmetic pretopos', 'general categorical definition', 'construction', 'arithmetic universes', 'André Joyal', 'categorical proof', 'Gödel's incompleteness results'

- Text: Bicategories of spans are characterized as cartesian bicategories in which every comonad has an Eilenberg-Moore object and every left adjoint arrow is comonadic.
- Concepts: 'cartesian bicategories', 'comonad', 'Eilenberg-Moore object', 'left adjoint arrow', 'comonadic'

- Text: Symbolic dynamics is partly the study of walks in a directed graph
- Concepts: 'symbolic dynamics', 'walks', 'directed graph'

- Text: By a walk, here we mean a morphism to the graph from the Cayley graph of the monoid of non-negative integers
- Concepts: 'morphism', 'graph', 'Cayley graph', 'monoid', 'non-negative integers'

- Text: Sets of these walks are also important in other areas, such as stochastic processes, automata, combinatorial group theory, C^*-algebras, etc
- Concepts: stochastic processes', 'automata', 'combinatorial group theory', 'C^*-algebras'

- Text: We put a Quillen model structure on the category of directed graphs, for which the weak equivalences are those graph morphisms which induce bijections on the set of walks

- Concepts: 'Quillen model structure', 'category', 'directed graphs', 'weak equivalences', 'graph morphisms', 'bijections', 'set of walks'

- Text: We determine the resulting homotopy category
- Concepts: 'homotopy category'

- Text: We also introduce a "finite-level" homotopy category which respects the natural topology on the set of walks
- Concepts: 'homotopy category', 'finite-level', 'natural topology', 'set of walks'

- Text: To each graph we associate a basal graph, well defined up to isomorphism
- Concepts: 'graph', 'basal graph', 'isomorphism'

- Text: We show that the basal graph is a homotopy invariant for our model structure, and that it is a finer invariant than the zeta series of a finite graph
- Concepts: 'homotopy invariant', 'model structure', 'basal graph', 'zeta series', 'finite graph'

- Text: We also show that, for finite walkable graphs, if B is basal and separated then the walk spaces for X and B are topologically conjugate if and only if X and B are homotopically equivalent for our model structure.
- Concepts: 'finite', 'graphs', 'basal', 'separated', 'walk spaces', 'topologically conjugate', 'homotopically equivalent', 'model structure'

- Text: We combine two recent ideas: cartesian differential categories, and restriction categories
- Concepts: cartesian differential categories', 'restriction categories'

- Text: The result is a new structure which axiomatizes the category of smooth maps defined on open subsets of R^n in a way that is completely algebraic
- Concepts: 'structure', 'axiomatizes', 'category', 'smooth maps', 'open subsets', 'R^n', 'completely algebraic'

- Text: We also give other models for the resulting structure, discuss what it means for a partial map to be additive or linear, and show that differential restriction structure can be lifted through various completion operations.
- Concepts: 'partial map', 'additive', 'linear', 'differential restriction structure', 'completion operations'

- Text: This paper reviews the basic properties of coherent spaces, characterizes them, and proves a theorem about countable meets of open sets
- Concepts: 'coherent spaces', 'countable meets', 'open sets', 'theorem'

- Text: A number of examples of coherent spaces are given, including the set of all congruences (equipped with the Zariski topology) of a model of a theory based on a set of partial operations

- Concepts: coherent spaces, congruences, Zariski topology, model of a theory, partial operations

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- Text: We also give two alternate proofs of the main theorem, one using a theorem of Isbell's and a second using an unpublished theorem of Makkai's
- Concepts: 'alternate proofs', 'theorem', 'Isbell's theorem', 'Makkai's theorem'

- Text: Finally, we apply these results to the Boolean cyclic spectrum and give some relevant examples.
- Concepts: 'Boolean cyclic spectrum'

- Text: We show that a reflective/coreflective pair of full subcategories satisfies a ``maximal-normal''-type equivalence if and only if it is an associated pair in the sense of Kelly and Lawvere.
- Concepts: 'reflective', 'coreflective', 'full subcategories', 'equivalence', 'associated pair', 'Kelly', 'Lawvere'

- Text: The category of Set-valued presheaves on a small category B is a topos
- Concepts: 'category', 'Set-valued presheaves', 'small category', 'topos'

- Text: Replacing Set by a bicategory S whose objects are sets and morphisms are spans, relations, or partial maps, we consider a category Lax(B, S) of S-valued lax functors on B

- Concepts: 'bicategory', 'sets', 'morphisms', 'spans', 'relations', 'partial maps', 'category', 'lax functors', 'S-valued'

- Text: When S = Span, the resulting category is equivalent to Cat/B, and hence, is rarely even cartesian closed
- Concepts: 'Span', 'category', 'equivalent', 'Cat/B', 'cartesian closed'

- Text: Restricting this equivalence gives rise to exponentiability characterizations for Lax(B, Rel) by Niefield and for Lax(B, Par) in this paper
- Concepts: 'exponentiability', 'Lax(B, Rel)', 'Lax(B, Par)'

- Text: Along the way, we obtain a characterization of those B for which the category UFL/B is a coreflective subcategory of Cat/B, and hence, a topos.
- Concepts: 'category', 'coreflective subcategory', 'topos'

- Text: A flow on a compact Hausdorff space is an automorphism
- Concepts: 'flow', 'compact Hausdorff space', 'automorphism'

- Text: Using the closed structure on the category of uniform spaces, a flow gives rise, by iteration, to an action of the integers on the topological group of automorphisms of the object
- Concepts: 'uniform spaces', 'closed structure', 'category', 'flow', 'iteration', 'action', 'integers', 'topological group', 'automorphisms'

- Text: We study special classes of flows: periodic, cocyclic, and almost cocyclic, mainly in term of the possibility of extending this action continuously to various compactifications of the integers.
- Concepts: 'flows', 'periodic', 'cocyclic', 'almost cocyclic', 'action', 'compactifications', 'integers'

- Text: We present a new explicit construction of categorical semidirect products in an arbitrary variety V of right Ω-loops and use it to obtain simplified descriptions of internal precrossed and crossed modules in V.
- Concepts: 'categorical semidirect products', 'variety V', 'right Ω-loops', 'internal precrossed modules', 'crossed modules'

- Text: Representables for double categories are defined to be lax morphisms into a certain double category of sets
- Concepts: 'double categories', 'lax morphisms', 'certain double category of sets'

- Text: We show that horizontal transformations from representables into lax morphisms correspond to elements of that lax morphism
- Concepts: 'horizontal transformations', 'representables', 'lax morphisms', 'elements'

- Text: Vertical arrows give rise to modules between representables
- Concepts: 'vertical arrows', 'modules', 'representables'

- Text: We establish that the Yoneda embedding is a strong morphism of lax double categories which is horizontally full and faithful and dense.
- Concepts: 'Yoneda embedding', 'strong morphism', 'lax double categories', 'horizontally full', 'faithful', 'dense'

- Text: In the context of Cartesian differential categories, the structure of the first-order chain rule gives rise to a fibration, the ``bundle category''
- Concepts: 'Cartesian differential categories', 'first-order chain rule', 'fibration', 'bundle category'

- Text: In the present paper we generalise this to the higher-order chain rule (originally developed in the traditional setting by Faà di Bruno in the nineteenth century); given any Cartesian differential category X, there is a ``higher-order chain rule fibration'' Faa(X) --> X over it
- Concepts: 'higher-order chain rule', 'Cartesian differential category', 'Faa di Bruno', 'nineteenth century', 'fibaration'

- Text: In fact, Faa is a comonad (over the category of Cartesian left (semi-)additive categories)
- Concepts: 'comonad', 'Cartesian', 'left additive categories', 'semi-additive categories'

- Text: Our main theorem is that the coalgebras for this comonad are precisely the Cartesian differential categories

- Concepts: 'comonad', 'coalgebras', 'Cartesian differential categories'

- Text: In a sense, this result affirms the ``correctness'' of the notion of Cartesian differential categories.
- Concepts: 'Cartesian differential categories'

- Text: In this paper, we consider a non-posetal analogue of the notion of involutive quantale; specifically, a (planar) monoidal category equipped with a covariant involution that reverses the order of tensoring
- Concepts: non-posetal, involutive quantale, monoidal category, covariant involution, tensoring

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- Text: We study the coherence issues that inevitably result when passing from posets to categories; we also link our subject with other notions already in the literature, such as balanced monoidal categories and dagger pivotal categories.
- Concepts: 'posets', 'categories', 'coherence', 'balanced monoidal categories', 'dagger pivotal categories'

- Text: For small involutive and integral quantaloids ${\cal Q}$ it is shown that covariant presheaves on symmetric ${\cal Q}$-categories are equivalent to certain subalgebras of a specific monad on the category of symmetric ${\cal Q}$-categories
- Concepts: quantaloids', 'covariant presheaves', 'symmetric categories', 'monad'

- Text: This construction is related to a weakening of the subobject classifier axiom which does not require the classification of all subalgebras, but only guarantees that classifiable subalgebras are uniquely classifiable
- Concepts: 'subobject classifier axiom', 'subalgebras', 'classifiable subalgebras', 'uniquely classifiable'

- Text: As an application the identification of closed left ideals of non-commutative C^*-algebras with certain "open", subalgebras of freely generated algebras is given.
- Concepts: 'non-commutative', 'C^*-algebras', 'closed left ideals', 'subalgebras', 'freely generated algebras'

- Text: We proved in a previous work that Cattani-Sassone's higher dimensional transition systems can be interpreted as a small-orthogonality class of a topological locally finitely presentable category of weak higher dimensional transition systems
- Concepts: 'higher dimensional', 'transition systems', 'small-orthogonality class', 'topological', 'locally finitely presentable category', 'weak higher dimensional transition systems'

- Text: In this paper, we turn our attention to the full subcategory of weak higher dimensional transition systems which are unions of cubes
- Concepts: 'weak higher dimensional transition systems', 'unions of cubes', 'subcategory'

- Text: It is proved that there exists a left proper combinatorial model structure such that two objects are weakly equivalent if and only if they have the same cubes after simplification of the labelling
- Concepts: 'combinatorial model structure', 'weakly equivalent', 'cubes', 'labelling', 'simplification'

- Text: This model structure is obtained by Bousfield localizing a model structure which is left determined with respect to a class of maps which is not the class of monomorphisms
- Concepts: model structure', 'Bousfield localization', 'left determined', 'class of maps', 'monomorphisms'

- Text: We prove that the higher dimensional transition systems corresponding to two process algebras are weakly equivalent if and only if they are isomorphic
- Concepts: higher dimensional transition systems', 'process algebras', 'weakly equivalent', 'isomorphic'

- Text: We also construct a second Bousfield localization in which two bisimilar cubical transition systems are weakly equivalent
- Concepts: 'Bousfield localization', 'bisimilar', 'cubical transition systems', 'weakly equivalent'

- Text: The appendix contains a technical lemma about smallness of weak factorization systems in coreflective subcategories which can be of independent interest

- Concepts: 'lemma', 'weak factorization systems', 'coreflective subcategories', 'smallness'

- Text: This paper is a first step towards a homotopical interpretation of bisimulation for higher dimensional transition systems.
- Concepts: 'homotopical', 'bisimulation', 'higher dimensional', 'transition systems'

- Text: We formulate an elementary condition on an involutive quantaloid Q under which there is a distributive law from the Cauchy completion monad over the symmetrisation comonad on the category of Q-enriched categories
- Concepts: 'involutive quantaloid', 'distributive law', 'Cauchy completion monad', 'symmetrisation comonad', 'enriched categories'

- Text: For such quantaloids, which we call Cauchy-bilateral quantaloids, it follows that the Cauchy completion of any symmetric Q-enriched category is again symmetric
- Concepts: 'quantaloids', 'Cauchy-bilateral quantaloids', 'Cauchy completion', 'symmetric', 'Q-enriched category'

- Text: Examples include Lawvere's quantale of non-negative real numbers and Walters' small quantaloids of closed cribles.
- Concepts: quantale', 'non-negative real numbers', 'small quantaloids', 'closed cribles'

- Text: Various concerns suggest looking for internal co-categories in categories with strong logical structure
- Concepts: 'internal co-categories', 'categories', 'strong logical structure'

- Text: It turns out that in any coherent category E, all co-categories are co-equivalence relations.
- Concepts: 'coherent category', 'co-categories', 'co-equivalence relations'

- Text: This paper constructs model structures on the categories of coalgebras and pointed irreducible coalgebras over an operad whose components are projective, finitely generated in each dimension, and satisfy a condition that allows one to take tensor products with a unit interval
- Concepts: 'operad', 'model structures', 'coalgebras', 'irreducible coalgebras', 'projective', 'finitely generated', 'tensor products', 'unit interval'

- Text: The underlying chain-complex is assumed to be unbounded and the results for bounded coalgebras over an operad are derived from the unbounded case.
- Concepts: 'chain-complex', 'unbounded', 'bounded coalgebras', 'operad'

- Text: We define Lie 3-algebras and prove that these are in 1-to-1 correspondence with the 3-term Lie infinity algebras whose bilinear and trilinear maps vanish in degree (1,1) and in total degree 1, respectively

- Concepts: 'Lie 3-algebras', '1-to-1 correspondence', '3-term Lie infinity algebras', 'bilinear maps', 'trilinear maps', 'degree'

- Text: Further, we give an answer to a question of Roytenberg pertaining to the use of the nerve and normalization functors in the study of the relationship between categorified algebras and truncated sh algebras.
- Concepts: 'nerve functor', 'normalization functor', 'categorified algebras', 'truncated sh algebras'

- Text: Adhesive categories are categories which have pushouts with one leg a monomorphism, all pullbacks, and certain exactness conditions relating these pushouts and pullbacks
- Concepts: 'Adhesive categories', 'pushouts', 'monomorphism', 'pullbacks', 'exactness conditions'

- Text: We give a new proof of the fact that every topos is adhesive
- Concepts: 'topos', 'adhesive'

- Text: We also prove a converse: every small adhesive category has a fully faithful functor in a topos, with the functor preserving the all the structure
- Concepts: 'adhesive category', 'fully faithful functor', 'topos', 'structure'

- Text: Combining these two results, we see that the exactness conditions in the definition of adhesive category are exactly the relationship between pushouts along monomorphisms and pullbacks which hold in any topos.
- Concepts: 'exactness', 'adhesive category', 'pushouts', 'monomorphisms', 'pullbacks', 'topos'

- Text: We explore a curious type of equivalence between certain pairs of reflective and coreflective subcategories
- Concepts: 'reflective subcategories', 'coreflective subcategories', 'equivalence'

- Text: We illustrate with examples involving noncommutative duality for C^*-dynamical systems and compact quantum groups, as well as examples where the subcategories are actually isomorphic.
- Concepts: 'noncommutative duality', 'C^*-dynamical systems', 'compact quantum groups', 'subcategories', 'isomorphic'

- Text: This article represents a preliminary attempt to link Kan extensions, and some of their further developments, to Fourier theory and quantum algebra through *-autonomous monoidal categories and related structures
- Concepts: 'Kan extensions', 'Fourier theory', 'quantum algebra', '*-autonomous monoidal categories'

- Text: There is a close resemblance to convolution products and the Wiener algebra (of transforms) in functional analysis

- Concepts: 'convolution products', 'Wiener algebra', 'functional analysis'

- Text: The analysis term ``kernel'' (of a distribution) has also been adapted below in connection with certain special types of ``distributors'' (in the terminology of J
- Concepts: kernel, distribution, distributors

- Text: Benabou) or ``modules'' (in the terminology of R
- Concepts: modules', 'terminology'

- Text: Street) in category theory
- Concepts: category theory'

- Text: In using the term ``graphic'', in a very broad sense, we are clearly distinguishing the categorical methods employed in this article from standard Fourier and wavelet mathematics
- Concepts: 'categorical methods', 'Fourier mathematics', 'wavelet mathematics'

- Text: The term ``graphic'' also applies to promultiplicative graphs, and related concepts, which can feature prominently in the theory.
- Concepts: 'promultiplicative graphs', 'related concepts', 'theory'

- Text: We compare various different definitions of ''the category of smooth objects''
- Concepts: 'category', 'smooth objects'

- Text: The definitions compared are due to Chen, Frolicher, Sikorski, Smith, and Souriau
- Concepts: 'definitions', 'Chen', 'Frolicher', 'Sikorski', 'Smith', 'Souriau'

- Text: The method of comparison is to construct functors between the categories that enable us to see how the categories relate to each other
- Concepts: 'method of comparison', 'functors', 'categories', 'relate'

- Text: Our method of study involves finding a general context into which these categories can be placed
- Concepts: method of study', 'general context', 'categories'

- Text: This involves considering categories wherein objects are considered in relation to a certain collection of standard test objects
- Concepts: 'categories', 'objects', 'standard test objects'

- Text: This therefore applies beyond the question of categories of smooth spaces.
- Concepts: 'categories', 'smooth spaces'

- Text: We study the condition, on a connected and locally connected geometric morphism $p : \cal E \to \cal S$, that the canonical natural transformation $p_*\to p_!$ should be (pointwise) epimorphic - a condition which F.W

- Concepts: 'connected', 'locally connected', 'geometric morphism', 'canonical natural transformation', 'epimorphic'

- Text: Lawvere called the `Nullstellensatz', but which we prefer to call `punctual local connectedness'
- Concepts: 'Nullstellensatz', 'punctual local connectedness'

- Text: We show that this condition implies that $p_!$ preserves finite products, and that, for bounded morphisms between toposes with natural number objects, it is equivalent to being both local and hyperconnected.
- Concepts: finite products, toposes, natural number objects, bounded morphisms, local, hyperconnected

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- Text: We consider commutative Frobenius algebras in braided strict monoidal categories in the study of the circuits and communicating systems which occur in Computer Science, including circuits in which the wires are tangled
- Concepts: 'commutative Frobenius algebra', 'braided strict monoidal category', 'circuits', 'communicating systems', 'Computer Science'

- Text: We indicate also some possible novel geometric interest in such algebras
- Concepts: geometric interest, algebras

- Text: For example, we show how Armstrong's description of knot colourings and knot groups fit into this context.

- Concepts: 'Armstrong', 'knot colourings', 'knot groups'

- Text: In this article we review the theory of anafunctors introduced by Makkai and Bartels, and show that given a subcanonical site S, one can form a bicategorical localisation of various 2-categories of internal categories or groupoids at weak equivalences using anafunctors as 1-arrows
- Concepts: 'subcanonical site', 'bicategorical localisation', '2-categories', 'internal categories', 'groupoids', 'weak equivalences', 'anafunctors', '1-arrows'

- Text: This unifies a number of proofs throughout the literature, using the fewest assumptions possible on S.
- Concepts: 'unifies', 'proofs', 'literature', 'assumptions'

- Text: We analyze the algebraic structure of the Connes fusion tensor product (CFTP) in the case of bi-finite Hilbert modules over a von Neumann algebra M
- Concepts: 'Connes fusion tensor product', 'bi-finite Hilbert module', 'von Neumann algebra'

- Text: It turns out that all complications in its definition disappear if one uses the closely related bi-modules of bounded vectors
- Concepts: 'bi-modules', 'bounded vectors'

- Text: We construct an equivalence of monoidal categories with duality between a category of Hilbert bi-modules over M with CFTP and some natural category of bi-modules over M with the usual relative algebraic tensor product.

- Concepts: 'monoidal categories', 'duality', 'Hilbert bi-modules', 'CFTP', 'natural category', 'relative algebraic tensor product', 'bi-modules'

- Text: Given a bisimplicial set, there are two ways to extract from it a simplicial set: the diagonal simplicial set and the less well known total simplicial set of Artin and Mazur
- Concepts: 'bisimplicial set', 'simplicial set', 'diagonal simplicial set', 'total simplicial set', 'Artin', 'Mazur'

- Text: There is a natural comparison map between these simplicial sets, and it is a theorem due to Cegarra and Remedios and independently Joyal and Tierney, that this comparison map is a weak homotopy equivalence for any bisimplicial set
- Concepts: 'simplicial sets', 'theorem', 'weak homotopy equivalence', 'bisimplicial set'

- Text: In this paper we will give a new, elementary proof of this result
- Concepts: 'elementary proof', 'result'

- Text: As an application, we will revisit Kan's simplicial loop group functor G
- Concepts: 'simplicial', 'loop group functor'

- Text: We will give a simple formula for this functor, which is based on a factorization, due to Duskin, of Eilenberg and Mac

Lane's classifying complex functor $\overline{W}$

- Concepts: 'functor', 'factorization', 'Eilenberg-Mac Lane', 'classifying complex functor'

- Text: We will give a new, short, proof of Kan's result that the unit map for the adjunction $G\dashv \overline{W}$ is a weak homotopy equivalence for reduced simplicial sets.
- Concepts: 'adjunction', 'weak homotopy equivalence', 'reduced simplicial sets'

- Text: Quantum categories were introduced by Day and Street as generalizations of both bi(co)algebroids and small categories
- Concepts: 'Quantum categories', 'bi(co)algebroids', 'small categories'

- Text: We clarify details of that work
- Concepts: none

- Text: In particular, we show explicitly how the monadic definition of a quantum category unpacks to a set of axioms close to the definitions of a bialgebroid in the Hopf algebraic literature
- Concepts: 'monadic definition', 'quantum category', 'set of axioms', 'bialgebroid', 'Hopf algebraic literature'

- Text: We introduce notions of functor and natural transformation for quantum categories and consider various constructions on quantum structures.

- Concepts: 'functor', 'natural transformation', 'quantum categories', 'quantum structures', 'constructions'

- Text: We discuss the problem of characterizing the property of a Grothendieck topos to satisfy a given `geometric' invariant as a property of its sites of definition, and indicate a set of general techniques for establishing such criteria
- Concepts: 'Grothendieck topos', 'geometric invariant', 'sites of definition', 'criteria'

- Text: We then apply our methodologies to specific invariants, notably including the property of a Grothendieck topos to be localic (resp
- Concepts: 'Grothendieck topos', 'localic'

- Text: atomic, locally connected, equivalent to a presheaf topos), obtaining explicit site characterizations for them.
- Concepts: atomic, locally connected, presheaf topos, site characterizations

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- Text: Given a double category $\mathbb D$ such that $\mathbb D_0$ has pushouts, we characterize oplax/lax adjunctions between $\mathbb D$ and $Cospan(\mathbb D_0)$ for which the right adjoint is normal and restricts to the identity on $\mathbb D_0$, where $Cospan(\mathbb D_0)$ is the double category on $\mathbb D_0$ whose vertical morphisms are cospans
- Concepts: 'double category', 'pushouts', 'oplax adjunctions', 'lax adjunctions', 'right adjoint', 'normal', 'identity', 'cospans'

- Text: We show that such a pair exists if and only if $\mathbb D$ has companions, conjoints, and 1-cotabulators
- Concepts: companion, conjoint, 1-cotabulator

- Text: The right adjoints are induced by the companions and conjoints, and the left adjoints by the 1-cotabulators
- Concepts: 'right adjoints', 'companions', 'conjoints', 'left adjoints', '1-cotabulators'

- Text: The notion of a 1-cotabulator is a common generalization of the symmetric algebra of a module and Artin-Wraith glueing of toposes, locales, and topological spaces.
- Concepts: 1-cotabulator', 'symmetric algebra', 'module', 'Artin-Wraith glueing', 'toposes', 'locales', 'topological spaces'

- Text: Motivated by constructions in the theory of inverse semigroups and etale groupoids, we define and investigate the concept of isotropy from a topos-theoretic perspective
- Concepts: 'inverse semigroups', 'etale groupoids', 'isotropy', 'topos-theoretic perspective'

- Text: Our main conceptual tool is a monad on the category of grouped toposes
- Concepts: 'monad', 'category', 'grouped toposes'

- Text: Its algebras correspond to a generalized notion of crossed module, which we call a crossed topos

- Concepts: 'algebras', 'generalized', 'crossed module', 'crossed topos'

- Text: As an application, we present a topos-theoretic characterization and generalization of the `Clifford, fundamental' sequence associated with an inverse semigroup.
- Concepts: 'topos-theoretic', 'characterization', 'generalization', 'Clifford sequence', 'fundamental sequence', 'inverse semigroup'

- Text: By the Lefschetz fixed point theorem, if an endomorphism of a topological space is fixed-point-free, then its Lefschetz number vanishes
- Concepts: Lefschetz fixed point theorem', 'endomorphism', 'topological space', 'fixed-point-free', 'Lefschetz number', 'vanishes'

- Text: This necessary condition is not usually sufficient, however; for that we need a refinement of the Lefschetz number called the Reidemeister trace
- Concepts: 'necessary condition', 'sufficient', 'Lefschetz number', 'Reidemeister trace'

- Text: Abstractly, the Lefschetz number is a trace in a symmetric monoidal category, while the Reidemeister trace is a trace in a bicategory; in this paper we relate these contexts using indexed symmetric monoidal categories. In particular, we will show that for any symmetric monoidal category with an associated indexed symmetric monoidal category, there is an associated bicategory which produces refinements of trace analogous to the Reidemeister trace

- Concepts: Lefschetz number', 'trace', 'symmetric monoidal category', 'Reidemeister trace', 'bicategory', 'indexed symmetric monoidal category', 'refinements'

- Text: This bicategory also produces a new notion of trace for parametrized spaces with dualizable fibers, which refines the obvious ``fiberwise'' traces by incorporating the action of the fundamental group of the base space
- Concepts: bicategory', 'parametrized spaces', 'dualizable fibers', 'trace', 'fiberwise traces', 'fundamental group', 'base space'

- Text: We also advance the basic theory of indexed monoidal categories, including introducing a string diagram calculus which makes calculations much more tractable
- Concepts: 'indexed monoidal categories', 'string diagram', 'calculus', 'calculations', 'tractable'

- Text: This abstract framework lays the foundation for generalizations of these ideas to other contexts.
- Concepts: 'abstract framework', 'foundation', 'generalizations', 'ideas', 'contexts'

- Text: Let ${L\dashv R:\cal X \rightarrow\cal Y}$ be an adjunction with R monadic and L comonadic
- Concepts: adjunction, monadic, comonadic

- Text: Denote the induced monad on $\cal Y$ by M and the induced comonad on $\calX$ by C
- Concepts: 'monad', 'comonad'

- Text: We characterize those C such that M satisfies the Explicit Basis property
- Concepts: 'characterize', 'satisfies', 'Explicit Basis property'

- Text: We also discuss some new examples and results motivated by this characterization.
- Concepts: 'examples', 'results', 'characterization'

- Text: We obtain semantic characterizations, holding for any Grothendieck site (C, J), for the models of a theory classified by a topos of the form $Sh(C,J)$ in terms of the models of a theory classified by a topos $[C^{op}, Set]$
- Concepts: 'Grothendieck site', 'topos', 'sheaf category', 'models of a theory'

- Text: These characterizations arise from an appropriate representation of flat functors into Grothendieck toposes based on an application of the Yoneda Lemma in conjunction with ideas from indexed category theory, and turn out to be relevant also in different contexts, in particular for addressing questions in classical Model Theory.
- Concepts: 'flat functors', 'Grothendieck toposes', 'Yoneda Lemma', 'indexed category theory', 'Model Theory'

- Text: Classification of homotopy n-types has focused on developing algebraic categories which are equivalent to categories of n-types
- Concepts: 'homotopy', 'n-types', 'algebraic categories', 'equivalent', 'categories'

- Text: We expand this theory by providing algebraic models of homotopy-theoretic constructions for stable one-types
- Concepts: 'algebraic models', 'homotopy-theoretic constructions', 'stable one-types'

- Text: These include a model for the Postnikov one-truncation of the sphere spectrum, and for its action on the model of a stable one-type
- Concepts: Postnikov one-truncation, sphere spectrum, stable one-type

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- Text: We show that a bicategorical cokernel introduced by Vitale models the cofiber of a map between stable one-types, and apply this to develop an algebraic model for the Postnikov data of a stable one-type.
- Concepts: 'bicategorical cokernel', 'cofiber', 'stable one-type', 'algebraic model', 'Postnikov data'

- Text: We give a simple algebraic description of opetopes in terms of chain complexes, and we show how this description is related to combinatorial descriptions in terms of treelike structures

- Concepts: 'opetopes', 'algebraic description', 'chain complexes', 'combinatorial descriptions', 'treelike structures'

- Text: More generally, we show that the chain complexes associated to higher categories generate graphlike structures
- Concepts: 'chain complexes', 'higher categories', 'graphlike structures'

- Text: The algebraic description gives a relationship between the opetopic approach and other approaches to higher category theory
- Concepts: 'algebraic description', 'opetopic approach', 'higher category theory'

- Text: It also gives an easy way to calculate the sources and targets of opetopes.
- Concepts: 'calculate', 'sources', 'targets', 'opetopes'

- Text: In this paper, which is the second part of a study of partial map categories with images, we investigate the interaction between images and various other kinds of categorical structure and properties
- Concepts: 'partial map categories', 'images', 'categorical structure', 'properties'

- Text: In particular, we consider images in the context of partial products, meets and discreteness and survey a taxonomy of structures leading towards the partial map categories of regular categories

- Concepts: 'partial products', 'meets', 'discreteness', 'taxonomy', 'structures', 'partial map categories', 'regular categories'

- Text: We also present a term logic for cartesian partial map categories with images and prove a soundness and completeness theorem for this logic
- Concepts: 'cartesian partial map categories', 'term logic', 'soundness', 'completeness theorem'

- Text: Finally, we exhibit several free constructions relating the different classes of categories under consideration.
- Concepts: 'free constructions', 'classes of categories'

- Text: In this two-part paper, we undertake a systematic study of abstract partial map categories in which every map has both a restriction (domain of definition) and a range (image)
- Concepts: 'partial map categories', 'restriction', 'domain of definition', 'range', 'image'

- Text: In this first part, we explore connections with related structures such as inverse categories and allegories, and establish two representational results
- Concepts: 'inverse categories', 'allegories', 'representational results'

- Text: The first of these explains how every range category can be fully and faithfully embedded into a category of partial maps equipped with a suitable factorization system

- Concepts: 'range category', 'fully embedded', 'faithfully embedded', 'category', 'partial maps', 'factorization system'

- Text: The second is a generalization of a result from semigroup theory by Boris Schein, and says that every small range category satisfying the additional condition that every map is an epimorphism onto its range can be faithfully embedded into the category of sets and partial functions with the usual notion of range
- Concepts: 'semigroup theory', 'small range category', 'epimorphism', 'faithfully embedded', 'category of sets', 'partial functions', 'usual notion of range'

- Text: Finally, we give an explicit construction of the free range category on a partial map category in terms of certain types of labeled trees.
- Concepts: 'range category', 'partial map category', 'labeled trees'

- Text: We give a generalized version of the Freyd conjecture and a way to think about a possible proof
- Concepts: 'generalized', 'Freyd conjecture', 'proof'

- Text: The essential point is to describe an elementary formal reduction of the question that holds in any triangulated category
- Concepts: 'elementary formal reduction', 'triangulated category'

- Text: There are no new results, but at least one known example drops out very easily.
- Concepts: none

- Text: Kornel Szlachanyi recently used the term skew-monoidal category for a particular laxified version of monoidal category
- Concepts: skew-monoidal category', 'laxified', 'monoidal category'

- Text: He showed that bialgebroids H with base ring R could be characterized in terms of skew-monoidal structures on the category of one-sided R-modules for which the lax unit was R itself
- Concepts: 'bialgebroids', 'base ring', 'skew-monoidal structures', 'category', 'one-sided R-modules', 'lax unit'

- Text: We define skew monoidales (or skew pseudo-monoids) in any monoidal bicategory $\cal M$
- Concepts: 'skew monoidales', 'skew pseudo-monoids', 'monoidal bicategory'

- Text: These are skew-monoidal categories when $\cal M$ is Cat
- Concepts: 'skew-monoidal categories', 'Cat'

- Text: Our main results are presented at the level of monoidal bicategories
- Concepts: 'monoidal bicategories'

- Text: However, a consequence is that quantum categories with base comonoid C in a suitably complete braided monoidal category $\CV$ are precisely skew monoidales in $Comod (\cal V)$ with unit coming from the counit of C
- Concepts: 'quantum categories', 'base comonoid', 'braided monoidal category', 'skew monoidales', 'Comod', 'unit', 'counit'

- Text: Quantum groupoids (in the sense of Chikhladze et al rather than Day and Street) are those skew monoidales with invertible associativity constraint
- Concepts: 'Quantum groupoids', 'skew monoidales', 'invertible associativity constraint'

- Text: In fact, we provide some very general results connecting opmonoidal monads and skew monoidales
- Concepts: 'opmonoidal monads', 'skew monoidales'

- Text: We use a lax version of the concept of warping defined by Booker and Street to modify monoidal structures.
- Concepts: 'lax version', 'concept of warping', 'monoidal structures'

- Text: We show that every internal biequivalence in a tricategory T is part of a biadjoint biequivalence
- Concepts: 'tricategory', 'internal biequivalence', 'biadjoint biequivalence'

- Text: We give two applications of this result, one for transporting monoidal structures and one for equipping a monoidal bicategory with invertible objects with a coherent choice of those inverses.
- Concepts: 'monoidal structure', 'monoidal bicategory', 'invertible objects', 'coherent choice'

- Text: We find the injective hulls of partially ordered monoids in the category whose objects are po-monoids and submultiplicative order-preserving functions
- Concepts: 'injective hulls', 'partially ordered monoids', 'category', 'po-monoids', 'submultiplicative', 'order-preserving functions'

- Text: These injective hulls are with respect to a special class of monics called ``embeddings''
- Concepts: 'injective hulls', 'monics', 'embeddings'

- Text: We show as well that the injective objects with respect to these embeddings are precisely the quantales.
- Concepts: 'injective objects', 'embeddings', 'quantales'

- Text: Two categories are called Morita equivalent if the categories of functors from these categories to the category of sets are equivalent
- Concepts: 'categories', 'Morita equivalent', 'functors', 'category of sets', 'equivalent'

- Text: We prove that congruence lattices of Morita equivalent small categories are isomorphic.

- Concepts: 'congruence lattices', 'Morita equivalent', 'small categories', 'isomorphic'

- Text: The relative cell complexes with respect to a generating set of cofibrations are an important class of morphisms in any model structure
- Concepts: 'relative cell complexes', 'generating set', 'cofibrations', 'model structure'

- Text: In the particular case of the standard (algebraic) model structure on Top, we give a new expression of these morphisms by defining a category of relative cell complexes, which has a forgetful functor to the arrow category
- Concepts: 'model structure', 'Top', 'relative cell complexes', 'forgetful functor', 'arrow category'

- Text: This allows us to prove a conjecture of Richard Garner: considering the algebraic weak factorisation system given in that algebraic model structure between cofibrations and trivial fibrations, we show that the category of relative cell complexes is equivalent to the category of coalgebras.
- Concepts: 'algebraic weak factorisation system', 'algebraic model structure', 'cofibrations', 'trivial fibrations', 'relative cell complexes', 'coalgebras'

- Text: For a generalisation of the classical theory of Hopf algebra over fields, A

- Concepts: 'generalisation', 'classical theory', 'Hopf algebra', 'fields'

- Text: Bruguièeres and A
- Concepts: None, as there are no math concepts mentioned in the context.

- Text: Virelizier study opmonoidal monads on monoidal categories (which they called bimonads,)
- Concepts: 'opmonoidal monads', 'monoidal categories', 'bimonads'

- Text: In a recent joint paper with S
- Concepts: None (there are no math concepts mentioned in the context)

- Text: Lack the same authors define the notion of a pre-Hopf monad by requiring only a special form of the fusion operator to be invertible
- Concepts: 'pre-Hopf monad', 'fusion operator', 'invertible'

- Text: In previous papers it was observed by the present authors that bimonads yield a special case of an entwining of a pair of functors (on arbitrary categories)
- Concepts: 'bimonads', 'entwining', 'pair of functors', 'arbitrary categories'

- Text: The purpose of this note is to show that in this setting the pre-Hopf monads are a special case of Galois entwinings
- Concepts: 'pre-Hopf monads', 'Galois entwinings'

- Text: As a byproduct some new properties are detected which make a (general) bimonad on a Cauchy complete category to a Hopf monad
- Concepts: 'bimonad', 'category', 'Cauchy complete category', 'Hopf monad'

- Text: In the final section applications to cartesian monoidal categories are considered.
- Concepts: 'cartesian monoidal categories'

- Text: Tannaka duality describes the relationship between algebraic objects in a given category and functors into that category; an important case is that of Hopf algebras and their categories of representations; these have strong monoidal forgetful ``fibre functors'' to the category of vector spaces
- Concepts: 'Tannaka duality', 'algebraic objects', 'category', 'functors', 'Hopf algebras', 'representations', 'monoidal', 'forgetful', 'fibre functors', 'vector spaces'

- Text: We simultaneously generalize the theory of Tannaka duality in two ways: first, we replace Hopf algebras with weak Hopf algebras and strong monoidal functors with separable Frobenius monoidal functors; second, we replace the category of vector spaces with an arbitrary braided monoidal category

- Concepts: 'Tannaka duality', 'weak Hopf algebras', 'strong monoidal functors', 'separable Frobenius monoidal functors', 'category', 'vector spaces', 'braided monoidal category'

- Text: To accomplish this goal, we make use of a graphical notation for functors between monoidal categories, using string diagrams with coloured regions
- Concepts: monoidal categories', 'functors', 'graphical notation', 'string diagrams'

- Text: Not only does this notation extend our capacity to give simple proofs of complicated calculations, it makes plain some of the connections between Frobenius monoidal or separable Frobenius monoidal functors and the topology of the axioms defining certain algebraic structures
- Concepts: 'notation', 'proofs', 'calculations', 'Frobenius monoidal', 'separable Frobenius monoidal', 'functors', 'topology', 'axioms', 'algebraic structures'

- Text: Finally, having generalized Tannaka duality to an arbitrary base category, we briefly discuss the functoriality of the construction as this base is varied.
- Concepts: 'Tannaka duality', 'functoriality', 'construction', 'base category'

- Text: In this note we provide a characterization, in terms of additional algebraic structure, of those strict intervals (certain cocategory objects) in a symmetric monoidal closed category

$\cal E$ that are representable in the sense of inducing on $\cal E$ the structure of a finitely bicomplete 2-category

- Concepts: 'strict intervals', 'cocategory objects', 'symmetric monoidal closed category', 'representable', 'finely bicomplete', '2-category'

- Text: Several examples and connections with the homotopy theory of 2-categories are also discussed.
- Concepts: 'homotopy theory', '2-categories'

- Text: We develop an alternative approach to star-autonomous comonads via linearly distributive categories
- Concepts: 'star-autonomous comonads', 'linearly distributive categories'

- Text: It is shown that in the autonomous case the notions of star-autonomous comonad and Hopf comonad coincide.
- Concepts: 'autonomous case', 'star-autonomous comonad', 'Hopf comonad'

- Text: We give characterizations, for various fragments of geometric logic, of the class of theories classified by a locally connected (respectively connected and locally connected, atomic, compact, presheaf) topos, and exploit the existence of multiple sites of definition for a given topos to establish various results on quotients of theories of presheaf type.
- Concepts: 'geometric logic', 'locally connected', 'connected', 'atomic', 'compact', 'presheaf', 'topos', 'sites of definition',

'quotients', 'theories of presheaf type'

- Text: We prove that the 2-category of closed categories of Eilenberg and Kelly is equivalent to a suitable full 2-subcategory of the 2-category of closed multicategories.
- Concepts: '2-category', 'closed categories', 'Eilenberg', 'Kelly', 'equivalent', 'full 2-subcategory', 'closed multicategories'

- Text: It is shown how the theory of commutative monads provides an axiomatic framework for several aspects of distribution theory in a broad sense, including probability distributions, physical extensive quantities, and Schwartz distributions of compact support
- Concepts: commutative monads, axiomatic framework, distribution theory, probability distributions, physical extensive quantities, Schwartz distributions, compact support

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- Text: Among the particular aspects considered here are the notions of convolution, density, expectation, and conditional probability.
- Concepts: convolution, density, expectation, conditional probability

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- Text: We construct, for any double complex in an abelian category, certain ``short-distance'' maps, and an exact sequence involving these, instances of which can be pieced together to give the ``long-distance'' maps and exact sequences of results such as the Snake Lemma

- Concepts: 'double complex', 'abelian category', 'short-distance maps', 'exact sequence', 'Snake Lemma', 'long-distance maps'

- Text: Further applications are given
- Concepts: None - the context does not contain any words that denote math concepts.

- Text: We also note what the building blocks of an analogous study of triple complexes would be.
- Concepts: 'triple complexes', 'building blocks', 'analogous study'

- Text: Based on a study of the 2-category of weak distributive laws, we describe a method of iterating Street's weak wreath product construction
- Concepts: '2-category', 'weak distributive law', 'iterating', "Street's weak wreath product construction"

- Text: That is, for any 2-category $cal K$ and for any non-negative integer n, we introduce 2-categories $\Wdl^{(n)}(\cal K)$, of $(n+1)$-tuples of monads in $\cal K$ pairwise related by weak distributive laws obeying the Yang-Baxter equation
- Concepts: 2-category, non-negative integer, 2-categories, monads, weak distributive laws, Yang-Baxter equation

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- Text: The first instance $\Wdl^{(0)}(\cal K)$ coincides with $\Mnd(\cal K)$, the usual 2-category of monads in $\cal K$, and for other values of n, $\Wdl^{(n)}(\cal K)$ contains

$\Mnd^{n+1}(\cK)$ as a full 2-subcategory

- Concepts: 'Mnd', '2-category', 'monads', 'full 2-subcategory'

- Text: For the local idempotent closure $\overline \cal K$ of $\cal K$, extending the multiplication of the 2-monad $\Mnd$, we equip these 2-categories with n possible `weak wreath product' 2-functors $\Wdl^{(n)}(\ocK)\to \Wdl^{(n-1)}(\overline \cal K)$, such that all of their possible $n$-fold composites $\Wdl^{(n)}(\overline \cal K)\to \Wdl^{(0)}(\overline \cal K)$ are equal; that is, such that the weak wreath product is `associative'
- Concepts: 'local idempotent closure', '2-monad', 'weak wreath product', '2-category', '2-functors', 'composites', 'associative'

- Text: Whenever idempotent 2-cells in $\cal K$ split, this leads to pseudofunctors $\Wdl^{(n)}(\cal K)\to \Wdl^{(n-1)}(\cal K)$ obeying the associativity property up-to isomorphism
- Concepts: 'idempotent', '2-cells', 'pseudofunctors', '\Wdl', 'associativity', 'up-to isomorphism'

- Text: We present a practically important occurrence of an iterated weak wreath product: the algebra of observable quantities in an Ising type quantum spin chain where the spins take their values in a dual pair of finite weak Hopf algebras
- Concepts: 'iterated weak wreath product', 'observable quantities', 'Ising type quantum spin chain', 'finite weak Hopf algebras'

- Text: We also construct a fully faithful embedding of $\Wdl^{(n)}(\overline \cal K)$ into the 2-category of commutative

$n+1$ dimensional cubes in $\Mnd(\overline \cal K)$ (hence into the 2-category of commutative $n+1$ dimensional cubes in $\cal K$ whenever $\cal K$ has Eilenberg-Moore objects and its idempotent 2-cells split)

- Concepts: $"\Wdl^{(n)}"$, "$\overline{\mathcal{K}}$", "2-category", "commutative", "$n+1$ dimensional cubes", "$\Mnd(\overline \cal K)$", "Eilenberg-Moore objects", "idempotent 2-cells"

- Text: Finally we give a sufficient and necessary condition on a monad in $\overline \cal K$ to be isomorphic to an n-ary weak wreath product.
- Concepts: 'monad', 'n-ary weak wreath product', 'isomorphic'

- Text: We show that colax idempotent pseudomonads and their algebras can be presented in terms of right Kan extensions
- Concepts: 'colax idempotent pseudomonads', 'algebras', 'presented', 'right Kan extensions'

- Text: Dually, lax idempotent pseudomonads and their algebras can be presented in terms of left Kan extensions
- Concepts: 'lax idempotent pseudomonads', 'algebras', 'left Kan extensions'

- Text: We also show that a distributive law of a colax idempotent pseudomonad over a lax idempotent pseudomonad has a presentation in terms of Kan extensions.

- Concepts: 'distributive law', 'colax idempotent pseudomonad', 'lax idempotent pseudomonad', 'presentation', 'Kan extensions'

- Text: The paper presents algebraic and logical developments
- Concepts: 'algebraic developments', 'logical developments'

- Text: From the algebraic viewpoint, we introduce Monadic Equational Systems as an abstract enriched notion of equational presentation
- Concepts: 'algebraic', 'Monadic Equational Systems', 'abstract', 'enriched', 'equational presentation'

- Text: From the logical viewpoint, we provide Equational Metalogic as a general formal deductive system for the derivability of equational consequences
- Concepts: 'logical viewpoint', 'Equational Metalogic', 'formal deductive system', 'derivability', 'equational consequences'

- Text: Relating the two, a canonical model theory for Monadic Equational Systems is given and for it the soundness of Equational Metalogic is established
- Concepts: 'Monadic Equational Systems', 'canonical model theory', 'Equational Metalogic', 'soundness'

- Text: This development involves a study of clone and double-dualization structures
- Concepts: clone structure, double-dualization structure, study

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- Text: We also show that in the presence of free algebras %constructions the model theory of Monadic Equational Systems satisfies an internal strong-completeness property.
- Concepts: 'model theory', 'Monadic Equational Systems', 'free algebras', 'internal strong-completeness property'

- Text: We extend the notion of exact completion on a category with weak finite limits to Lawvere's elementary doctrines
- Concepts: 'exact completion', 'category', 'weak finite limits', 'Lawvere', 'elementary doctrines'

- Text: We show how any such doctrine admits an elementary quotient completion, which is the universal solution to adding certain quotients
- Concepts: 'elementary quotient completion', 'universal solution', 'quotients'

- Text: We note that the elementary quotient completion can be obtained as the composite of two other universal constructions: one adds effective quotients, the other forces extensionality of morphisms
- Concepts: 'elementary quotient completion', 'composite', 'universal constructions', 'effective quotients', 'extensionality', 'morphisms'

- Text: We also prove that each construction preserves comprehension.
- Concepts: 'construction', 'preserves', 'comprehension'

- Text: Bruguières, Lack and Virelizier have recently obtained a vast generalization of Sweedler's Fundamental Theorem of Hopf modules, in which the role of the Hopf algebra is played by a bimonad
- Concepts: 'generalization', 'Fundamental Theorem of Hopf modules', 'Hopf algebra', 'bimonad'

- Text: We present an extension of this result which involves, in addition to the bimonad, a comodule-monad and a algebra-comonoid over it
- Concepts: 'bimonad', 'comodule-monad', 'algebra-comonoid'

- Text: As an application we obtain a generalization of another classical theorem from the Hopf algebra literature, due to Schneider, which itself is an extension of Sweedler's result (to the setting of Hopf Galois extensions).
- Concepts: 'generalization', 'theorem', 'Hopf algebra', 'Schneider', 'extension', 'Sweedler', 'Hopf Galois extensions'

- Text: We study the composition of modules between lax functors of weak double categories
- Concepts: 'modules', 'lax functors', 'weak double categories', 'composition'

- Text: We adapt the bicategorical notion of local cocompleteness to weak double categories, which the codomain of our lax functors will be assumed to satisfy

- Concepts: 'weak double categories', 'local cocompleteness', 'lax functors', 'codomain'

- Text: We introduce a notion of factorization of cells, which most weak double categories of interest possess, and which is sufficient to guarantee the strong representability of composites of modules between lax functors whose domain satisfies it.
- Concepts: 'factorization', 'cells', 'weak double categories', 'representability', 'composites', 'modules', 'lax functors'

- Text: Let G be an object of a finitely cocomplete homological category $\mathbb C$
- Concepts: 'object', 'homological category', 'finitely cocomplete'

- Text: We study actions of G on objects A of $\mathbb C$ (defined by Bourn and Janelidze as being algebras over a certain monad $\mathbb T_G$), with two objectives: investigating to which extent actions can be described in terms of smaller data, called action cores; and to single out those abstract action cores which extend to actions corresponding to semi-direct products of A and G (in a non-exact setting, not every action does)
- Concepts: G, $\mathbb C$, algebras, monad, action cores, semi-direct products

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- Text: This amounts to exhibiting a subcategory of the category of the actions of G on objects A which is equivalent with the category of points in $\mathbb C$ over G, and to describing it in terms of action cores

- Concepts: 'subcategory', 'category of actions', 'G', 'equivalent category', 'points in $\mathbb C$ over G', 'action cores'

- Text: This notion and its study are based on a preliminary investigation of co-smash products, in which cross-effects of functors in a general categorical context turn out to be a useful tool
- Concepts: 'co-smash products', 'functors', 'categorical context'

- Text: The co-smash products also allow us to define higher categorical commutators, different from the ones of Huq, which are not generally expressible in terms of nested binary ones
- Concepts: 'co-smash products', 'higher categorical commutators', 'Huq', 'nested binary ones'

- Text: We use strict action cores to show that any normal subobject of an object E (i.e., the equivalence class of 0 for some equivalence relation on E in $\mathbb C$) admits a strict conjugation action of E
- Concepts: 'strict action cores', 'normal subobject', 'equivalence class', 'equivalence relation', 'strict conjugation action'

- Text: If $\mathbb C$ is semi-abelian, we show that for subobjects X, Y of some object A, X is proper in the supremum of X and Y if and only if X is stable under the restriction to Y of the conjugation action of A on itself
- Concepts: 'semi-abelian', 'subobject', 'object', 'proper', 'supremum', 'stable', 'restriction', 'conjugation action'

- Text: This also amounts to an alternative proof of Bourn and Janelidze's category equivalence between points over G in $\mathbb C$ and actions of G in the semi-abelian context
- Concepts: 'category equivalence', 'points', 'G', '$\mathbb C$', 'actions', 'semi-abelian context'

- Text: Finally, we show that the two axioms of an algebra which characterize G-actions are equivalent with three others ones, in terms of action cores
- Concepts: 'algebra', 'G-actions', 'action cores'

- Text: These axioms are commutative squares involving only co-smash products
- Concepts: 'axioms', 'commutative squares', 'co-smash products'

- Text: Two of them are associativity type conditions which generalize the usual properties of an action of one group on another, while the third is kind of a higher coherence condition which is a consequence of the other two in the category of groups, but probably not in general
- Concepts: 'associativity', 'group', 'action', 'coherence', 'category'

- Text: As an application, we characterize abelian action cores, that is, action cores corresponding to Beck modules; here also the coherence condition follows from the others.
- Concepts: 'abelian', 'action cores', 'Beck modules', 'coherence condition'

- Text: Lawvere's notion of completeness for quantale-enriched categories has been extended to the theory of lax algebras under the name of L-completeness
- Concepts: 'quantale-enriched categories', 'L-completeness', 'lax algebras'

- Text: In this paper we introduce the corresponding morphism concept and examine its properties
- Concepts: 'morphism concept', 'properties'

- Text: We explore some important relativized topological concepts like separatedness, denseness, compactness and compactification with respect to L-complete morphisms
- Concepts: 'relativized topological concepts', 'separatedness', 'denseness', 'compactness', 'compactification', 'L-complete morphisms'

- Text: Moreover, we show that separated L-complete morphisms belong to a factorization system.
- Concepts: 'L-complete', 'morphisms', 'factorization system'

- Text: The characterization of stably closed maps of topological spaces as the closed maps with compact fibres and the role of the Kuratowski-Mrówka' Theorem in this characterization are being explored in the general context of lax (T,V)-algebras, for a quantale V and a Set-monad T with a lax extension to V-relations
- Concepts: stably closed maps, topological spaces, compact fibres, Kuratowski-Mrówka' Theorem, lax (T,V)-algebras,

quantale, Set-monad, V-relations

- Text: The general results are being applied in standard (topological and metric) and non-standard (labeled graphs) contexts.
- Concepts: 'topological', 'metric', 'labeled graphs'

- Text: We consider a symmetric monoidal closed category $V = (V, \otimes, I, [-,-])$ together with a regular injective object Q such that the functor $[-, Q] : \to V^{op}$ is comonadic and prove that in such a category, as in the monoidal category of abelian groups, a morphism of commutative monoids is an effective descent morphism for modules if and only if it is a pure monomorphism
- Concepts: 'symmetric monoidal closed category', 'object', 'functor', 'comonadic', 'monoidal category', 'abelian groups', 'morphism', 'commutative monoids', 'effective descent morphism', 'modules', 'pure monomorphism'

- Text: Examples of this kind of monoidal categories are elementary toposes considered as cartesian closed monoidal categories, the module categories over a commutative ring object in a Grothendieck topos and Barr's star-autonomous categories.
- Concepts: monoidal categories, cartesian closed monoidal categories, module categories, commutative ring object, Grothendieck topos, star-autonomous categories, Barr's star-autonomous categories

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- Text: In 2001 Barr and Kleisli described *-autonomous structures on two full subcategories of topological abelian groups
- Concepts: '*-autonomous structures', 'full subcategories', 'topological abelian groups'

- Text: In this paper we do the same for sup semi-lattices except that uniform structures play the role that topology did in the earlier paper.
- Concepts: 'sup semi-lattices', 'uniform structures', 'topology'

- Text: We prove that all semi-abelian categories with the the Smith is Huq property satisfy the Commutator Condition(CC): higher central extensions may be characterised in terms of binary (Huq or Smith) commutators
- Concepts: 'semi-abelian category', 'Smith is Huq property', 'Commutator Condition', 'higher central extensions', 'binary commutators'

- Text: In fact, even Higgins commutators suffice
- Concepts: 'Higgins commutators'

- Text: As a consequence, in the presence of enough projectives we obtain explicit Hopf formulae for homology with coefficients in the abelianisation functor, and an interpretation of cohomology with coefficients in an abelian object in terms of equivalence classes of higher central extensions
- Concepts: projectives, Hopf formulae, homology, abelianisation functor, cohomology, abelian object, equivalence classes, central

extensions

- Text: We also give a counterexample against (CC) in the semi-abelian category of (commutative) loops.
- Concepts: semi-abelian category, commutative loops, counterexample

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- Text: We introduce an intrinsic description of the Ursini commutator in any ideal determined category and we compare it with the Higgins and Huq commutators
- Concepts: 'intrinsic description', 'Ursini commutator', 'ideal determined category', 'Higgins commutator', 'Huq commutator'

- Text: After describing also the Smith-Pedicchio commutator by means of canonical arrows from a coproduct, we compare the two notions, showing that in any exact Mal'tsev normal category the Ursini commutator $[H,K]_{U}$ of two subobjects H, K of A is the normalization of the Smith-Pedicchio commutator of the equivalence relations generated by H and K, extending the result valid for ideal determined varieties given by Ursini and Gumm.
- Concepts: 'canonical arrows', 'coproduct', 'exact category', 'Mal'tsev normal category', 'Ursini commutator', 'subobjects', 'Smith-Pedicchio commutator', 'equivalence relations', 'ideal determined varieties'

- Text: We prove a general theorem which includes most notions of "exact completion" as special cases

- Concepts: 'general theorem', 'exact completion', 'special cases'

- Text: The theorem is that "κ-ary exact categories" are a reflective sub-2-category of "κ-ary sites", for any regular cardinal κ
- Concepts: exact categories, reflective sub-2-category, κ-ary sites, regular cardinal κ

- Text: A κ-ary exact category is an exact category with disjoint and universal κ-small coproducts, and a κ-ary site is a site whose covering sieves are generated by κ-small families and which satisfies a solution-set condition for finite limits relative to κ. In the unary case, this includes the exact completions of a regular category, of a category with (weak) finite limits, and of a category with a factorization system
- Concepts: 'κ-ary', 'exact category', 'coproducts', 'site', 'covering sieves', 'κ-small families', 'solution-set condition', 'finite limits', 'regular category', 'weak finite limits', 'factorization system', 'exact completions'

- Text: When $\kappa=\omega$ it includes the pretopos completion of a coherent category
- Concepts: coherent category, pretopos completion

- Text: And when $\kappa=\infty$ is the size of the universe, it includes the category of sheaves on a small site, and the category of small presheaves on a locally small and finitely complete category
- Concepts: category, sheaves, site, presheaves, locally small, finitely complete

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- Text: The ∞-ary exact completion of a large nontrivial site gives a well-behaved "category of small sheaves". Along the way, we define a slightly generalized notion of "morphism of sites" and show that κ-ary sites are equivalent to a type of "enhanced allegory"
- Concepts: '∞-ary exact completion', 'large nontrivial site', 'category of small sheaves', 'morphism of sites', 'κ-ary sites', 'enhanced allegory'

- Text: This enables us to construct the exact completion in two ways, which can be regarded as decategorifications of "representable profunctors" (i.e
- Concepts: 'exact completion', 'decategorifications', 'representable profunctors'

- Text: entire functional relations) and "anafunctors", respectively.
- Concepts: functional relations, anafunctors

- Text: We investigate 3-permutability, in the sense of universal algebra, in an abstract categorical setting which unifies the pointed and the non-pointed contexts in categorical algebra
- Concepts: '3-permutability', 'universal algebra', 'abstract categorical setting', 'pointed', 'non-pointed', 'categorical algebra'

- Text: This leads to a unified treatment of regular subtractive categories and of regular Goursat categories, as well as of E-subtractive varieties (where E is the set of constants in a variety) recently introduced by the fourth author

- Concepts: 'subtractive categories', 'regular subtractive categories', 'Goursat categories', 'subtractive varieties', 'constants', 'variety'

- Text: As an application, we show that ``ideals'' coincide with ``clots'' in any regular subtractive category, which can be considered as a pointed analogue of a known result for regular Goursat categories.
- Concepts: 'ideals', 'clots', 'regular subtractive category', 'pointed analogue', 'regular Goursat categories'

- Text: We define a strong relation in a category $\mathbb{C}$ to be a span which is ``orthogonal'' to the class of jointly epimorphic pairs of morphisms
- Concepts: 'category', 'strong relation', 'span', 'epimorphic pairs', 'morphisms'

- Text: Under the presence of finite limits, a strong relation is simply a strong monomorphism $R\rightarrow X\times Y$
- Concepts: 'finite limits', 'strong relation', 'strong monomorphism'

- Text: We show that a category $\mathbb{C}$ with pullbacks and equalizers is a weakly Mal'tsev category if and only if every reflexive strong relation in $\mathbb{C}$ is an equivalence relation
- Concepts: 'category', 'pullbacks', 'equalizers', 'Mal\'tsev category', 'reflexive relation', 'strong relation', 'equivalence relation'

- Text: In fact, we obtain a more general result which includes, as its another particular instance, a similar well-known characterization of Mal'tsev categories.
- Concepts: 'Mal\'tsev categories', 'general result', 'characterization'

- Text: A category is adhesive if it has all pullbacks, all push-outs along monomorphisms, and all exactness conditions between pullbacks and pushouts along monomorphisms which hold in a topos
- Concepts: 'category', 'adhesive', 'pullbacks', 'push-outs', 'monomorphisms', 'exactness conditions', 'topos'

- Text: This condition can be modified by considering only pushouts along regular monomorphisms, or by asking only for the exactness conditions which hold in a quasitopos
- Concepts: 'pushouts', 'regular monomorphisms', 'exactness conditions', 'quasitopos'

- Text: We prove four characterization theorems dealing with adhesive categories and their variants.
- Concepts: 'adhesive categories', 'characterization theorems', 'variants'

- Text: For a small category B and a double category $\mathbb D$, let ${\rm Lax}_N(B,\mathbb D)$ denote the category whose objects are vertical normal lax functors $B\to\mathbb D$ and morphisms are horizontal lax transformations

- Concepts: 'small category', 'double category', 'vertical normal lax functors', 'horizontal lax transformations'

- Text: It is well known that $Lax_N(B, \mathbb Cat) \simeq Cat/B$, where $\mathbb Cat$ is the double category of small categories, functors, and profunctors
- Concepts: 'Lax functor', 'double category', 'small categories', 'functors', 'profunctors'

- Text: We generalized this equivalence to certain double categories, in the case where B is a finite poset
- Concepts: 'double categories', 'finite poset'

- Text: Street showed that $Y\to B$ is exponentiable in Cat/B if and only if the corresponding normal lax functor $B\to \mathbb Cat$ is a pseudo-functor
- Concepts: exponentiable, Cat/B, normal lax functor, pseudo-functor

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- Text: Using our generalized equivalence, we show that a morphism $Y\to B$ is exponentiable in $ {\mathbb D}_0/B$ if and only if the corresponding normal lax functor $B\to\mathbb D$ is a pseudo-functor plus an additional condition that holds for all $X\to !B$ in Cat
- Concepts: exponentiable, morphism, normal lax functor, pseudo-functor, additional condition, Cat

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- Text: Thus, we obtain a single theorem which yields characterizations of certain exponentiable morphisms of small categories, topological spaces, locales, and posets.
- Concepts: 'exponentiable morphisms', 'small categories', 'topological spaces', 'locales', 'posets'

- Text: There is a lot of redundancy in the usual definition of adjoint functors
- Concepts: 'adjoint functors'

- Text: We define and prove the core of what is required
- Concepts: 'core', 'define', 'prove', 'required'

- Text: First we do this in the hom-enriched context
- Concepts: 'hom-enriched context'

- Text: Then we do it in the cocompletion of a bicategory with respect to Kleisli objects, which we then apply to internal categories
- Concepts: 'cocompletion', 'bicategory', 'Kleisli objects', 'internal categories'

- Text: Finally, we describe a doctrinal setting.
- Concepts: None - the given context does not contain any words that denote Math concepts.

- Text: We call a finitely complete category diexact if every difunctional relation admits a pushout which is stable under pullback and itself a pullback

- Concepts: 'finitely complete category', 'dexact', 'difunctional relation', 'pushout', 'stable under pullback', 'pullback'

- Text: We prove three results relating to diexact categories: firstly, that a category is a pretopos if and only if it is diexact with a strict initial object; secondly, that a category is diexact if and only if it is Barr-exact, and every pair of monomorphisms admits a pushout which is stable and a pullback; and thirdly, that a small category with finite limits and pushouts of difunctional relations is diexact if and only if it admits a full structure-preserving embedding into a Grothendieck topos.
- Concepts: 'diexact categories', 'pretopos', 'strict initial object', 'Barr-exact', 'monomorphisms', 'pushout', 'stable', 'pullback', 'small category', 'finite limits', 'difunctional relations', 'full structure-preserving embedding', 'Grothendieck topos'

- Text: The classes of stably-vertical, normal, separable, inseparable, purely inseparable and covering morphisms, defined in categorical Galois theory, are characterized for the reflection of the variety of commutative semigroups into its subvariety of semilattices
- Concepts: 'stable-vertical', 'normal', 'separable', 'inseparable', 'purely inseparable', 'covering morphisms', 'categorical Galois theory', 'reflection', 'commutative semigroups', 'subvariety', 'semilattices'

- Text: It is also shown that there is an inseparable-separable factorization, but there is no monotone-light factorization.
- Concepts: 'inseparable-separable factorization', 'monotone-light factorization'

- Text: Recently Benno~van~den~Berg introduced a new class of realizability toposes which he christened Herbrand toposes
- Concepts: 'realizability toposes', 'Herbrand toposes'

- Text: These toposes have strikingly different properties from ordinary realizability toposes, notably the (related) properties that the `constant object' functor from the topos of sets preserves finite coproducts, and that De Morgan's law is satisfied
- Concepts: 'topos', 'realizability toposes', 'constant object functor', 'finite coproducts', 'De Morgan\'s law'

- Text: In this paper we show that these properties are no accident: for any Schonfinkel algebra Λ, the Herbrand realizability topos over Λ may be obtained as the Gleason cover (in the sense of Johnstone (1980)) of the ordinary realizability topos over Λ
- Concepts: 'Schonfinkel algebra', 'Herbrand realizability topos', 'Gleason cover', 'ordinary realizability topos'

- Text: As a corollary, we obtain the functoriality of the Herbrand realizability construction on the category of Schonfinkel algebras and computationally dense applicative morphisms.

- Concepts: 'functoriality', 'Herbrand realizability construction', 'category', 'Schonfinkel algebras', 'computationally dense', 'applicative morphisms'

- Text: An ergodic action of a compact quantum group G on an operator algebra A can be interpreted as a quantum homogeneous space for G
- Concepts: 'ergodic action', 'compact quantum group', 'operator algebra', 'quantum homogeneous space'

- Text: Such an action gives rise to the category of finite equivariant Hilbert modules over A, which has a module structure over the tensor category $Rep(G)$ of finite-dimensional representations of G
- Concepts: 'Hilbert module', 'equivariant Hilbert module', 'module structure', 'tensor category', 'finite-dimensional representations'

- Text: We show that there is a one-to-one correspondence between the quantum G-homogeneous spaces up to equivariant Morita equivalence, and indecomposable module C^*-categories over $Rep(G)$ up to natural equivalence
- Concepts: 'quantum', 'G-homogeneous spaces', 'equivariant Morita equivalence', 'indecomposable module', 'C^*-categories', 'natural equivalence', 'Rep(G)'

- Text: This gives a global approach to the duality theory for ergodic actions as developed by C
- Concepts: 'duality theory', 'ergodic actions'

- Text: Pinzari and J
- Concepts: None provided. The given context does not contain any math-related terms or concepts.

- Text: Roberts.
- Concepts: None. There are no math concepts mentioned in the given context.

- Text: This is the first in a series of papers laying the foundations for a differential graded approach to derived differential geometry (and other geometries in characteristic zero)
- Concepts: 'differential graded approach', 'derived differential geometry', 'geometries in characteristic zero'

- Text: In this paper, we study theories of supercommutative algebras for which infinitely differentiable functions can be evaluated on elements
- Concepts: 'supercommutative algebras', 'infinitely differentiable functions', 'evaluated on elements'

- Text: Such a theory is called a super Fermat theory
- Concepts: 'super Fermat theory'

- Text: Any category of superspaces and smooth functions has an associated such theory
- Concepts: category', 'superspaces', 'smooth functions', 'associated theory'

- Text: This includes both real and complex supermanifolds, as well as algebraic superschemes
- Concepts: supermanifolds, complex supermanifolds, algebraic superschemes

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- Text: In particular, there is a super Fermat theory of C^∞-superalgebras
- Concepts: 'super Fermat theory', 'C^∞-superalgebras'

- Text: C^∞-superalgebras are the appropriate notion of supercommutative algebras in the world of C^∞-rings, the latter being of central importance both to synthetic differential geometry and to all existing models of derived smooth manifolds
- Concepts: C^∞-superalgebras, supercommutative algebras, C^∞-rings, synthetic differential geometry, derived smooth manifolds

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- Text: A super Fermat theory is a natural generalization of the concept of a Fermat theory introduced by E
- Concepts: 'super Fermat theory', 'Fermat theory'

- Text: Dubuc and A
- Concepts: None provided. The context does not mention any specific math concepts or terms.

- Text: Kock
- Concepts: None provided. Additional Context is needed.

- Text: We show that any Fermat theory admits a canonical superization, however not every super Fermat theory arises in this way
- Concepts: 'Fermat theory', 'canonical superization', 'super Fermat theory'

- Text: For a fixed super Fermat theory, we go on to study a special subcategory of algebras called near-point determined algebras, and derive many of their algebraic properties.
- Concepts: 'super Fermat theory', 'subcategory', 'algebras', 'near-point determined algebras', 'algebraic properties'

- Text: We introduce the notion of weakly globular double categories, a particular class of strict double categories, as a way to model weak 2-categories
- Concepts: 'weakly globular double categories', 'strict double categories', 'weak 2-categories', 'model'

- Text: We show that this model is suitably equivalent to bicategories and give an explicit description of the functors involved in this biequivalence
- Concepts: 'model', 'bicategories', 'biclassification', 'functors', 'biequivalence'

- Text: As an application we show that groupoidal weakly globular double categories model homotopy 2-types.
- Concepts: 'groupoidal', 'weakly globular', 'double categories', 'homotopy', '2-types'

- Text: We define relative regular Mal'tsev categories and give an overview of conditions which are equivalent to the relative Mal'tsev axiom
- Concepts: 'relative regular Mal\'tsev categories', 'relative Mal\'tsev axiom'

- Text: These include conditions on relations as well as conditions on simplicial objects
- Concepts: relations, simplicial objects

- Text: We also give various examples and counterexamples.
- Concepts: various examples, counterexamples

- Text: Cartesian differential categories abstractly capture the notion of a differentiation operation
- Concepts: 'Cartesian differential categories', 'differentiation operation'

- Text: In this paper, we develop some of the theory of such categories by defining differential forms and exterior differentiation in this setting
- Concepts: 'differential forms', 'exterior differentiation', 'theory', 'categories'

- Text: We show that this exterior derivative, as expected, produces a cochain complex.
- Concepts: 'exterior derivative', 'cochain complex'

- Text: In this article we extend the theory of lax monoidal structures, also known as multitensors, and the monads on categories of enriched graphs that they give rise to
- Concepts: 'lax monoidal structures', 'multitensors', 'monads', 'categories of enriched graphs'

- Text: Our first principal result - the lifting theorem for multitensors - enables us to see the Gray tensor product of 2-categories and the Crans tensor product of Gray categories as part of this framework
- Concepts: 'multitensors', 'lifting theorem', 'Gray tensor product', '2-categories', 'Crans tensor product', 'Gray categories', 'framework'

- Text: We define weak n-categories with strict units by means of a notion of reduced higher operad, using the theory of algebraic weak factorisation systems
- Concepts: 'n-categories', 'strict units', 'reduced higher operad', 'algebraic weak factorisation systems'

- Text: Our second principal result is to establish a lax tensor product on the category of weak n-categories with strict units, so that enriched categories with respect to this tensor product are exactly weak (n+1)-categories with strict units.
- Concepts: 'lax tensor product', 'weak n-categories', 'strict units', 'enriched categories', '(n+1)-categories'

- Text: In this paper we unify the developments of Batanin [1998], Batanin-Weber [2011] and Cheng [2011] into a single framework in which the interplay between multitensors on a category V, and monads on the category $\cal G V$ of graphs enriched in V, is taken as fundamental
- Concepts: category theory, Batanin, Batanin-Weber, Cheng, framework, multitensors, monads, graphs, enriched

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- Text: The material presented here is the conceptual background for subsequent work: in Batanin-Cisinski-Weber [2013] the Gray tensor product of 2-categories and the Crans [1999] tensor product of Gray categories are exhibited as existing within our framework, and in Weber [2013] the explicit construction of the funny tensor product of categories is generalised to a large class of Batanin operads.
- Concepts: 'conceptual background', 'Gray tensor product', '2-categories', 'Crans tensor product', 'Gray categories', 'framework', 'explicit construction', 'funny tensor product', 'categories', 'Batanin operads'

- Text: It is known that strict omega-categories are equivalent through the nerve functor to complicial sets and to sets with complicial identities
- Concepts: 'strict omega-categories', 'nerve functor', 'complicial sets', 'sets with complicial identities'

- Text: It follows that complicial sets are equivalent to sets with complicial identities

- Concepts: 'complicial sets', 'sets with complicial identities'

- Text: We discuss these equivalences
- Concepts: 'equivalences'

- Text: In particular we give a conceptual proof that the nerves of omega-categories are complicial sets, and a direct proof that complicial sets are sets with complicial identities.
- Concepts: 'omega-categories', 'complicial sets', 'complicial identities', 'nerves'

- Text: We show that the nerve of a strict omega-category can be described algebraically as a simplicial set with additional operations subject to certain identities
- Concepts: 'nerve', 'strict omega-category', 'algebraically', 'simplicial set', 'additional operations', 'identities'

- Text: The resulting structures are called sets with complicial identities
- Concepts: complicial identities', 'sets with complicial identities'

- Text: We also construct an equivalence between the categories of strict omega-categories and of sets with complical identities.
- Concepts: omega-categories', 'strict omega-categories', 'equivalence', 'categories', 'sets', 'complical identities'

- Text: In this paper we consider generalized metric spaces in the sense of Lawvere and the categorical Isbell completion construction

- Concepts: 'generalized metric spaces', 'Lawvere', 'categorical', 'Isbell completion construction'

- Text: We show that this is an analogue of the tight span construction of classical metric spaces, and that the Isbell completion coincides with the directed tight span of Hirai and Koichi
- Concepts: 'tight span construction', 'metric spaces', 'Isbell completion', 'directed tight span'

- Text: The notions of categorical completion and cocompletion are related to the existence of semi-tropical module structure, and it is shown that the Isbell completion (hence the directed tight span) has two different semi-tropical module structures.
- Concepts: 'categorical completion', 'cocompletion', 'semi-tropical module structure', 'Isbell completion', 'directed tight span'

- Text: We develop a theory of categories which are simultaneously (1) indexed over a base category S with finite products, and (2) enriched over an S-indexed monoidal category V
- Concepts: 'categories', 'indexed categories', 'base category', 'finite products', 'enrichment', 'monoidal category', 'indexed monoidal category'

- Text: This includes classical enriched categories, indexed and fibered categories, and internal categories as special cases

- Concepts: enriched categories', 'indexed categories', 'fibered categories', 'internal categories', 'special cases'

- Text: We then describe the appropriate notion of ``limit'' for such enriched indexed categories, and show that they admit ``free cocompletions'' constructed as usual with a Yoneda embedding.
- Concepts: 'enriched indexed categories', 'limit', 'free cocompletions', 'Yoneda embedding'

- Text: Each distributor between categories enriched over a small quantaloid Q gives rise to two adjunctions between the categories of contravariant and covariant presheaves, and hence to two monads
- Concepts: 'categories enriched over a quantaloid', 'adjunctions', 'contravariant presheaves', 'covariant presheaves', 'monads'

- Text: These two adjunctions are respectively generalizations of Isbell adjunctions and Kan extensions in category theory
- Concepts: 'adjunctions', 'generalizations', 'Isbell adjunctions', 'Kan extensions', 'category theory'

- Text: It is proved that these two processes are functorial with infomorphisms playing as morphisms between distributors; and that the free cocompletion functor of Q-categories factors through both of these functors.
- Concepts: functorial, infomorphisms, morphisms, distributors, free cocompletion functor, Q-categories

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- Text: The purpose of this text is the study of the class of homotopy types which are modelized by strict ∞-groupoids
- Concepts: 'homotopy types', 'modelized', 'strict ∞-groupoids'

- Text: We show that the homotopy category of simply connected strict ∞-groupoids is equivalent to the derived category in homological degree $d \ge 2$ of abelian groups
- Concepts: 'homotopy category', 'simply connected', '∞-groupoids', 'derived category', 'homological degree', 'abelian groups'

- Text: We deduce that the simply connected homotopy types modelized by strict ∞-groupoids are precisely the products of Eilenberg-Mac Lane spaces
- Concepts: 'simply connected', 'homotopy types', 'strict ∞-groupoids', 'products', 'Eilenberg-Mac Lane spaces'

- Text: We also briefly study 3-categories with weak inverses
- Concepts: 3-categories', 'weak inverses'

- Text: We finish by two questions about the problem suggested by the title of this text.
- Concepts: problem, title, text

- Text: Moerdijk's site description for equivariant sheaf toposes on open topological groupoids is used to give a proof for the (known, but apparently unpublished) proposition that if H is a subgroupoid of an open topological groupoid G, then the topos of equivariant sheaves on H is a subtopos of the topos of equivariant sheaves on G

- Concepts: 'open topological groupoid', 'subgroupoid', 'topos', 'equivariant sheaves'

- Text: This proposition is then applied to the study of quotient geometric theories and subtoposes
- Concepts: 'proposition', 'quotient', 'geometric theories', 'subtoposes'

- Text: In particular, an intrinsic characterization is given of those subgroupoids that are definable by quotient theories.
- Concepts: 'intrinsic characterization', 'subgroupoids', 'quotient theories', 'definable'

- Text: We introduce an axiomatic framework for the parallel transport of connections on gerbes
- Concepts: 'axiomatic framework', 'parallel transport', 'connections', 'gerbes'

- Text: It incorporates parallel transport along curves and along surfaces, and is formulated in terms of gluing axioms and smoothness conditions
- Concepts: 'parallel transport', 'curves', 'surfaces', 'gluing axioms', 'smoothness conditions'

- Text: The smoothness conditions are imposed with respect to a strict Lie 2-group, which plays the role of a band, or structure 2-group
- Concepts: 'smoothness conditions', 'strict Lie 2-group', 'band', 'structure 2-group'

- Text: Upon choosing certain examples of Lie 2-groups, our axiomatic framework reproduces in a systematical way several known concepts of gerbes with connection: non-abelian differential cocycles, Breen-Messing gerbes, abelian and non-abelian bundle gerbes
- Concepts: 'Lie 2-group', 'axiomatic framework', 'gerbes with connection', 'non-abelian differential cocycles', 'Breen-Messing gerbes', 'abelian bundle gerbes', 'non-abelian bundle gerbes'

- Text: These relationships convey a well-defined notion of surface holonomy from our axiomatic framework to each of these concrete models
- Concepts: 'well-defined notion', 'surface holonomy', 'axiomatic framework', 'concrete models'

- Text: Till now, holonomy was only known for abelian gerbes; our approach reproduces that known concept and extends it to non-abelian gerbes
- Concepts: 'holonomy', 'abelian gerbes', 'non-abelian gerbes'

- Text: Several new features of surface holonomy are exposed under its extension to non-abelian gerbes; for example, it carries an action of the mapping class group of the surface.

- Concepts: 'surface holonomy', 'extension', 'non-abelian gerbes', 'action', 'mapping class group', 'surface'

- Text: By Gelfand-Neumark duality, the category C^*Alg of commutative C^*-algebras is dually equivalent to the category of compact Hausdorff spaces, which by Stone duality, is also dually equivalent to the category $ubal$ of uniformly complete bounded Archimedean ℓ-algebras
- Concepts: 'Gelfand-Neumark duality', 'category', 'commutative', 'C^*-algebras', 'dually equivalent', 'compact Hausdorff spaces', 'Stone duality', 'uniformly complete', 'bounded', 'Archimedean', 'ℓ-algebras'

- Text: Consequently, C^*Alg is equivalent to $ubal$, and this equivalence can be described through complexification. In this article we study $ubal$ within the larger category bal of bounded Archimedean ℓ-algebras
- Concepts: C^*Alg, 'equivalent', 'ubal', 'complexification', 'bounded', 'Archimedean', 'ℓ-algebras'

- Text: We show that $ubal$ is the smallest nontrivial reflective subcategory of bal, and that $ubal$ consists of exactly those objects in bal that are epicomplete, a fact that includes a categorical formulation of the Stone-Weierstrass theorem for bal
- Concepts: '$ubal', 'reflective subcategory', '$bal', 'epicomplete', 'categorical formulation', 'Stone-Weierstrass theorem'

- Text: It follows that $ubal$ is the unique nontrivial reflective epicomplete subcategory of bal
- Concepts: 'unique', 'reflective', 'epicomplete', 'subcategory'

- Text: We also show that each nontrivial reflective subcategory of bal is both monoreflective and epireflective, and exhibit two other interesting reflective subcategories of bal involving Gelfand rings and square closed rings. Dually, we show that Specker ${\mathbb R}$-algebras are precisely the co-epicomplete objects in bal
- Concepts: 'reflective subcategory', 'monoreflective', 'epireflective', 'Gelfand rings', 'square closed rings', 'co-epicomplete objects'

- Text: We prove that the category $spec$ of Specker $\mathbb R$-algebras is a mono-coreflective subcategory of bal that is co-epireflective in a mono-coreflective subcategory of bal consisting of what we term ℓ-clean rings, a version of clean rings adapted to the order-theoretic setting of bal. We conclude the article by discussing the import of our results in the setting of complex $*$-algebras through complexification.
- Concepts: $category$, $Specker \mathbb R$-algebras, $mono-coreflective$, $subcategory$, bal, ℓ-clean rings, $order-theoretic$, $complex *$-algebras, $complexification$

- Text: We exhibit sufficient conditions for a monoidal monad T on a monoidal category C to induce a monoidal structure on the Eilenberg--Moore category C^T that represents bimorphisms

- Concepts: 'monoidal monad', 'monoidal category', 'Eilenberg-Moore category', 'bimorphisms'

- Text: The category of actions in C^T is then shown to be monadic over the base category C.
- Concepts: 'category', 'actions', 'monadic', 'base category'

- Text: In this paper, we prove that the category of vacant n-tuple groupoids is equivalent to the category of factorizations of groupoids by n factors that satisfy some Yang-Baxter type equation
- Concepts: 'category', 'groupoids', 'vacant n-tuple groupoids', 'equivalence', 'factorizations', 'Yang-Baxter type equation'

- Text: Moreover we extend this equivalence to the category of maximally exclusive n-tuple groupoids, which we define, by dropping one assumption
- Concepts: 'maximally exclusive', 'n-tuple groupoids'

- Text: The paper concludes by a note on how these results could tell us more about some Lie groups of interest.
- Concepts: 'Lie groups'

- Text: Suppose that S is a space
- Concepts: 'space'

- Text: There is an injective and a projective model structure for the resulting category of spaces with S-action, and both are easily derived
- Concepts: 'injective', 'projective', 'model structure', 'category of spaces', 'S-action', 'derived'

- Text: These model structures are special cases of model structures for presheaf-valued diagrams X defined on a fixed presheaf of categories E which is enriched in simplicial sets. Varying the parameter category object E (or parameter space S) along with the diagrams X up to weak equivalence requires model structures for E-diagrams having weak equivalences defined by homotopy colimits, and a generalization of Thomason's model structure for small categories to a model structure for presheaves of simplicial categories.
- Concepts: 'model structures', 'presheaf-valued diagrams', 'enriched in simplicial sets', 'parameter category object', 'parameter space', 'weak equivalence', 'homotopy colimits', 'Thomason's model structure', 'small categories', 'presheaves of simplicial categories'

- Text: We present the no-iteration version of the coherence conditions necessary to define a pseudomonad, and a description of the algebras for it in a similar fashion
- Concepts: 'coherence conditions', 'pseudomonad', 'algebras'

- Text: We show that every no-iteration pseudomonad induces a pseudomonad, and that the corresponding algebras are equivalent

- Concepts: 'no-iteration pseudomonad', 'pseudomonad', 'corresponding algebras', 'equivalent'

- Text: We also show that every pseudomonad induces a no-iteration pseudomonad, and again, that the corresponding algebras are equivalent
- Concepts: 'pseudomonad', 'no-iteration pseudomonad', 'algebras', 'equivalent'

- Text: We conclude with an analysis of the algebras for the 2-monad $(-)^{\mathbf{2}}$ on Cat in the light of the no-iteration description of the algebras.
- Concepts: '2-monad', 'Cat', 'algebras', 'no-iteration description'

- Text: Even a functor without an adjoint induces a monad, namely, its codensity monad; this is subject only to the existence of certain limits
- Concepts: functor, adjoint, monad, codensity monad, existence, limits

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- Text: We clarify the sense in which codensity monads act as substitutes for monads induced by adjunctions
- Concepts: 'codensity monads', 'substitutes', 'monads', 'adjunctions'

- Text: We also expand on an undeservedly ignored theorem of Kennison and Gildenhuys: that the codensity monad of the inclusion of (finite sets) into (sets) is the ultrafilter monad

- Concepts: 'codensity monad', 'inclusion', 'finite sets', 'sets', 'ultrafilter monad', 'theorem'

- Text: This result is analogous to the correspondence between measures and integrals
- Concepts: correspondence, measures, integrals

- Text: So, for example, we can speak of integration against an ultrafilter
- Concepts: integration, ultrafilter

- Text: Using this language, we show that the codensity monad of the inclusion of (finite-dimensional vector spaces) into (vector spaces) is double dualization
- Concepts: 'codensity monad', 'inclusion', 'finite-dimensional vector spaces', 'vector spaces', 'double dualization'

- Text: From this it follows that compact Hausdorff spaces have a linear analogue: linearly compact vector spaces
- Concepts: 'compact Hausdorff spaces', 'linear analogue', 'linearly compact vector spaces'

- Text: Finally, we show that ultraproducts are categorically inevitable: the codensity monad of the inclusion of (finite families of sets) into (families of sets) is the ultraproduct monad.
- Concepts: ultraproducts, categorically inevitable, codensity monad, inclusion, finite families of sets, families of sets,

ultraproduct monad

- Text: The category of bisimplicial presheaves carries a model structure for which the weak equivalences are defined by the diagonal functor and the cofibrations are monomorphisms
- Concepts: 'category', 'bisimplicial presheaves', 'model structure', 'weak equivalences', 'diagonal functor', 'cofibrations', 'monomorphisms'

- Text: This model structure has the most cofibrations of a large family of model structures with weak equivalences defined by the diagonal
- Concepts: 'model structure', 'cofibrations', 'weak equivalences', 'diagonal'

- Text: The diagonal structure for bisimplicial presheaves specializes to a diagonal model structure for bisimplicial sets, for which the fibrations are the Kan fibrations.
- Concepts: 'bisimplicial presheaves', 'diagonal structure', 'diagonal model structure', 'bisimplicial sets', 'Kan fibrations'

- Text: We show that every geometric morphism between realizability toposes satisfies the condition that its inverse image commutes with the `constant object' functors, which was assumed by John Longley in his pioneering study of such morphisms
- Concepts: 'geometric morphism', 'realizability toposes', 'inverse image', 'constant object', 'John Longley', 'pioneering study'

- Text: We also provide the answer to something which was stated as an open problem on Jaap van Oosten's book on realizability toposes: if a subtopos of a realizability topos is (co)complete, it must be either the topos of sets or the degenerate topos
- Concepts: 'realizability topos', 'subtopos', '(co)complete', 'topos of sets', 'degenerate topos'

- Text: And we present a new and simpler condition equivalent to the notion of computational density for applicative morphisms of Schonfinkel algebras.
- Concepts: 'computational density', 'applicative morphisms', 'Schonfinkel algebras'

- Text: By a `completion' on a 2-category K we mean here an idempotent pseudomonad on K
- Concepts: '2-category', 'idempotent pseudomonad'

- Text: We are particularly interested in pseudomonads that arise from KZ-doctrines
- Concepts: 'pseudomonads', 'KZ-doctrines'

- Text: Motivated by a question of Lawvere, we compare the Cauchy completion, defined in the setting of V-Cat for V a symmetric monoidal closed category, with the Grothendieck completion, defined in the setting of S-Indexed Cat for S a topos
- Concepts: 'Cauchy completion', 'V-Cat', 'symmetric monoidal closed category', 'Grothendieck completion', 'S-Indexed Cat', 'topos'

- Text: To this end we introduce a unified setting (`indexed enriched category theory') in which to formulate and study certain properties of KZ-doctrines
- Concepts: 'indexed enriched category theory', 'KZ-doctrines', 'formulate', 'study', 'properties'

- Text: We find that, whereas all of the KZ-doctrines that are relevant to this discussion (Karoubi, Cauchy, Stack, Grothendieck) may be regarded as `bounded', only the Cauchy and the Grothendieck completions are `tightly bounded' - two notions that we introduce and study in this paper
- Concepts: 'KZ-doctrines', 'Karoubi', 'Cauchy', 'Stack', 'Grothendieck', 'bounded', 'Cauchy completion', 'Grothendieck completion', 'tightly bounded', 'introduce', 'study'

- Text: Tightly bounded KZ-doctrines are shown to be idempotent
- Concepts: KZ-doctrines', 'tightly bounded', 'idempotent'

- Text: We also show, in a different approach to answering the motivating question, that the Cauchy completion (defined using `distributors') and the Grothendieck completion (defined using `generalized functors') are actually equivalent constructions.
- Concepts: 'Cauchy completion', 'distributors', 'Grothendieck completion', 'generalized functors', 'equivalent constructions'

- Text: We show that any traced $*$-autonomous category is compact closed.
- Concepts: 'traced', '$*$-autonomous category', 'compact closed'

- Text: We deeply analyse the structural organisation of the fibration of points and of the monad of internal groupoids
- Concepts: 'structural organisation', 'fibration', 'points', 'monad', 'internal groupoids'

- Text: From that we derive: 1) a new characterization of internal groupoids among reflexive graphs in the Mal'cev context; 2) a setting in which a Mal'cev category is necessarily a protomodular category.
- Concepts: 'internal groupoids', 'reflexive graphs', 'Mal\'cev context', 'Mal\'cev category', 'protomodular category'

- Text: The category $_{A}\mathbb{S}_{A}$ of bisemimodules over a semialgebra $A,$ with the so called Takahashi's tensor-like product $-\boxtimes _{A}-,$ is semimonoidal but not monoidal
- Concepts: 'category', 'bisemimodules', 'semialgebra', 'Takahashi tensor', 'semimonoidal', 'monoidal'

- Text: Although not a unit in $_{A}\mathbb{S}% _{A},$ the base semialgebra A has properties of a semiunit (in a sense which we clarify in this note)
- Concepts: 'semialgebra', 'unit', 'semiunit'

- Text: Motivated by this interesting example, we investigate semiunital semimonoidal categories $(\mathcal{V}% ,\bullet ,\mathbf{I})$ as a framework for studying notions like semimonoids (semicomonoids) as well as a notion of monads (comonads) which we call $\mathbb{J}$-monads

($\mathbb{J}$-comonads) with respect to the endo-functor $\mathbb{J}:=\mathbf{I}\bullet -\simeq -\bullet \mathbf{I}:\mathcal{V}\longrightarrow \mathcal{V}.$ This motivated also introducing a more generalized notion of monads (comonads) in arbitrary categories with respect to arbitrary endo-functors

- Concepts: 'semiunital semimonoidal categories', 'semimonoids', 'semicomonoids', 'monads', 'comonads', '$\mathbb{J}$-monads', '$\mathbb{J}$-comonads', 'endo-functor', 'generalized notion'

- Text: Applications to the semiunital semimonoidal variety $(_{A}\mathbb{S}_{A},\boxtimes _{A},A) $ provide us with examples of semiunital A-semirings (semicounital A-semicorings) and semiunitary semimodules (semicounitary semicomodules) which extend the classical notions of unital rings (counital corings) and unitary modules (counitary comodules).
- Concepts: semiunital, semimonoidal variety, $\boxtimes_A$, semiunital A-semirings, semicounital A-semicorings, semiunitary semimodules, semicounitary semicomodules, unital rings, counital corings, unitary modules, counitary comodules

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- Text: The main source of inspiration for the present paper is the work of R
- Concepts: None found. The context does not mention any specific math concepts.

- Text: Rosebrugh and R.J

- Concepts: None, as there are no math concepts mentioned in the context.

- Text: Wood on constructively completely distributive lattices where the authors elegantly employ the concepts of adjunction and module
- Concepts: 'completely distributive lattice', 'adjunction', 'module'

- Text: Both notions (suitably adapted) are available in topology too, which permits us to investigate topological, metric and other kinds of spaces in a similar spirit
- Concepts: 'topology', 'metric space', 'spaces'

- Text: We introduce here the notion of distributive space and algebraic space and show in particular that the category of distributive spaces and colimit preserving maps is dually equivalent to the idempotent split completion of a category of spaces and convergence relations between them
- Concepts: 'distributive space', 'algebraic space', 'category of distributive spaces', 'colimit preserving maps', 'idempotent split completion', 'convergence relations'

- Text: We explain the connection of this result to the well-known duality between topological spaces and frames, and deduce further duality theorems.
- Concepts: 'connection', 'duality', 'topological spaces', 'frames', 'duality theorems'

- Text: Given a horizontal monoid M in a duoidal category $\cal F$, we examine the relationship between bimonoid structures on M and monoidal structures on the category $\cal F^{\ast M}$ of right M-modules which lift the vertical monoidal structure of $\cal F$
- Concepts: 'horizontal monoid', 'duoidal category', 'bimonoid structures', 'monoidal structures', 'right M-modules', 'vertical monoidal structure'

- Text: We obtain our result using a variant of the so-called Tannaka adjunction; that is, an adjunction inducing the equivalence which expresses Tannaka duality
- Concepts: 'Tannaka adjunction', 'adjunction', 'equivalence', 'Tannaka duality'

- Text: The approach taken utilizes hom-enriched categories rather than categories on which a monoidal category acts (``actegories'')
- Concepts: 'hom-enriched categories', 'monoidal category', 'actegories'

- Text: The requirement of enrichment in $\cal F$ itself demands the existence of some internal homs, leading to the consideration of convolution for duoidal categories
- Concepts: 'enrichment', '$\cal F$', 'internal homs', 'convolution', 'duoidal categories'

- Text: Proving that certain hom-functors are monoidal, and so take monoids to monoids, unifies classical convolution in algebra and Day convolution for categories
- Concepts: 'hom-functors', 'monoidal', 'monoids', 'convolution', 'algebra', 'Day convolution', 'categories'

- Text: Hopf bimonoids are defined leading to a lifting of closed structures on $\cal F$ to $\cal F^{\ast M}$
- Concepts: 'Hopf bimonoids', 'closed structures'

- Text: We introduce the concept of warping monoidal structures and this permits the construction of new duoidal categories.
- Concepts: warping monoidal structures', 'duoidal categories'

- Text: One of the open problems in higher category theory is the systematic construction of the higher dimensional analogues of the Gray tensor product of 2-categories
- Concepts: 'open problems', 'higher category theory', 'higher dimensional analogues', 'Gray tensor product', '2-categories'

- Text: In this paper we continue the developments of [Batanin-Weber, 2011], [Weber, 2011] and [Batanin-Cisinski-Weber, 2011] by understanding the natural generalisations of Gray's little brother, the funny tensor product of categories
- Concepts: 'paper', 'developments', 'generalisations', 'Gray\'s little brother', 'funny tensor product', 'categories'

- Text: In fact we exhibit for any higher categorical structure definable by a normalised n-operad in the sense of Batanin, an analogous tensor product which forms a symmetric monoidal closed structure on the category of algebras of the operad.
- Concepts: 'higher categorical structure', 'normalised n-operad', 'tensor product', 'symmetric monoidal closed structure', 'category of algebras', 'operad'

- Text: We study the monoidal structure of the standard strictification functor $st : Bicat \rightarrow 2Cat$
- Concepts: 'monoidal structure', 'standard strictification functor', 'Bicat', '2Cat'

- Text: In doing so, we construct monoidal structures on the 2-category whose objects are bicategories and on the 2-category whose objects are 2-categories.
- Concepts: 'monoidal structures', 'bicategories', '2-categories'

- Text: We study the totality of categories weakly enriched in a monoidal bicategory using a notion of enriched icon as 2-cells
- Concepts: 'category', 'monoidal bicategory', 'weakly enriched', 'enriched icon', '2-cells'

- Text: We show that when the monoidal bicategory in question is symmetric then this process can be iterated
- Concepts: 'monoidal bicategory', 'symmetric', 'iterated process'

- Text: We show that starting from the symmetric monoidal bicategory Cat and performing the construction twice yields a convenient symmetric monoidal bicategory of partially strict tricategories
- Concepts: 'symmetric monoidal bicategory', 'Cat', 'construction', 'partially strict tricategories'

- Text: We show that restricting to the doubly degenerate ones immediately gives the correct bicategory of `2-tuply monoidal categories' missing from our earlier studies of the Periodic Table
- Concepts: 'doubly degenerate', 'bicategory', '2-tuply monoidal categories', 'Periodic Table'

- Text: We propose a generalisation to all k-tuply monoidal n-categories.
- Concepts: k-tuply monoidal n-categories', 'generalisation'

- Text: Geometric morphisms between realizability toposes are studied in terms of morphisms between partial combinatory algebras (pcas)
- Concepts: 'geometric morphisms', 'realizability toposes', 'partial combinatory algebras', 'pcas', 'morphisms'

- Text: The morphisms inducing geometric morphisms (the computationally dense ones) are seen to be the ones whose `lifts' to a kind of completion have right adjoints
- Concepts: 'geometric morphisms', 'morphisms', 'computationally dense', 'lifts', 'completion', 'right adjoints'

- Text: We characterize topos inclusions corresponding to a general form of relative computability
- Concepts: 'topos', 'inclusions', 'relative computability'

- Text: We characterize pcas whose realizability topos admits a geometric morphism to the effective topos.
- Concepts: 'pcas', 'realizability topos', 'geometric morphism', 'effective topos'

- Text: In this paper we introduce two notions - systems of fibrant objects and fibration structures--- which will allow us to associate to a bicategory B a homotopy bicategory $Ho(B)$ in such a way that $Ho(B)$ is the universal way to add pseudo-inverses to weak equivalences in B
- Concepts: 'homotopy bicategory', 'bicategory', 'weak equivalences', 'pseudo-inverses', 'systems of fibrant objects', 'fibration structures'

- Text: Furthermore, $Ho(B)$ is locally small when B is and $Ho(B)$ is a 2-category when B is
- Concepts: 'locally small', '2-category'

- Text: We thereby resolve two of the problems with known approaches to bicategorical localization. As an important example, we describe a fibration structure on the 2-category of prestacks on a site and prove that the resulting homotopy bicategory is the 2-category of stacks

- Concepts: 'bicategorical localization', '2-category', 'prestacks', 'site', 'homotopy bicategory', 'stacks'

- Text: We also show how this example can be restricted to obtain algebraic, differentiable and topological (respectively) stacks as homotopy categories of algebraic, differential and topological (respectively) prestacks.
- Concepts: algebraic, differentiable, topological, stacks, homotopy categories, prestacks

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- Text: Given a torsion bundle gerbe on a compact smooth manifold or, more generally, on a compact étale Lie groupoid M, we show that the corresponding category of gerbe modules is equivalent to the category of finitely generated projective modules over an Azumaya algebra on M
- Concepts: 'torsion bundle gerbe', 'compact smooth manifold', 'étale Lie groupoid', 'category of gerbe modules', 'finitely generated projective modules', 'Azumaya algebra'

- Text: This result can be seen as an equivariant Serre-Swan theorem for twisted vector bundles.
- Concepts: 'equivariant', 'Serre-Swan theorem', 'twisted vector bundles'

- Text: Given a monad T on a suitable enriched category B equipped with a proper factorization system (E,M), we define notions of T-completion, T-closure, and T-density

- Concepts: monad, enriched category, proper factorization system, T-completion, T-closure, T-density

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- Text: We show that not only the familiar notions of completion, closure, and density in normed vector spaces, but also the notions of sheafification, closure, and density with respect to a Lawvere-Tierney topology, are instances of the given abstract notions
- Concepts: 'normed vector spaces', 'completion', 'closure', 'density', 'sheafification', 'Lawvere-Tierney topology'

- Text: The process of T-completion is equally the enriched idempotent monad associated to T (which we call the idempotent core of T), and we show that it exists as soon as every morphism in B factors as a T-dense morphism followed by a T-closed M-embedding
- Concepts: T-completion, enriched idempotent monad, idempotent core, T-dense morphism, T-closed M-embedding

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- Text: The latter hypothesis is satisfied as soon as B has certain pullbacks as well as wide intersections of M-embeddings
- Concepts: 'pullbacks', 'wide intersections', 'M-embeddings'

- Text: Hence the resulting theorem on the existence of the idempotent core of an enriched monad entails Fakir's existence result in the non-enriched case, as well as adjoint functor factorization results of Applegate-Tierney and Day.

- Concepts: 'enriched monad', 'idempotent core', 'adjoint functor factorization'

- Text: In this paper we consider a notion of pointwise Kan extension in double categories that naturally generalises Dubuc's notion of pointwise Kan extension along enriched functors
- Concepts: 'pointwise Kan extension', 'double categories', 'Dubuc', 'enriched functors'

- Text: We show that, when considered in equipments that admit opcartesian tabulations, it generalises Street's notion of pointwise Kan extension in 2-categories.
- Concepts: 'equipments', 'opcartesian tabulations', 'generalises', 'Street's notion', 'pointwise Kan extension', '2-categories'

- Text: We provide a diagrammatic criterion for the existence of an absolute colimit in the context of enriched category theory.
- Concepts: 'diagrammatic criterion', 'absolute colimit', 'enriched category theory'

- Text: We show that the category of categories fibred over a site is a generalized Quillen model category in which the weak equivalences are the local equivalences and the fibrant objects are the stacks, as they were defined by J
- Concepts: 'category', 'fibred over', 'site', 'generalized Quillen model category', 'weak equivalence', 'local equivalence', 'fibrant objects', 'stacks'

- Text: Giraud
- Concepts: None - there is not enough information in the context to extract any math concepts.

- Text: The generalized model category restricts to one on the full subcategory whose objects are the categories fibred in groupoids
- Concepts: 'generalized model category', 'full subcategory', 'categories fibred in groupoids'

- Text: We show that the category of sheaves of categories is a model category that is Quillen equivalent to the generalized model category for stacks and to the model category for strong stacks due to A
- Concepts: 'sheaves of categories', 'model category', 'Quillen equivalent', 'generalized model category', 'stacks', 'strong stacks'

- Text: Joyal and M
- Concepts: None mentioned in the context provided

- Text: Tierney.
- Concepts: None, as "Tierney" is a name and not a math concept.

- Text: A pre-cohesive geometric morphism $p:\cal E \rightarrow \cal S$ satisfies Continuity if the canonical $p_! (X^{p^* S}) \rightarrow (p_! X)^S$ is an iso for every X in $\cal E$ and S in $\cal S$
- Concepts: 'pre-cohesive geometric morphism', 'continuity', 'canonical', 'iso'

- Text: We show that if $\cal S = Set$ and $\cal E$ is a presheaf topos then, p satisfies Continuity if and only if it is a quality type
- Concepts: presheaf topos, Continuity, quality type

- Text: Our proof of this characterization rests on a related result showing that Continuity and Sufficient Cohesion are incompatible for presheaf toposes
- Concepts: 'characterization', 'Continuity', 'Sufficient Cohesion', 'presheaf toposes'

- Text: This incompatibility raises the question whether Continuity and Sufficient Cohesion are ever compatible for Grothendieck toposes
- Concepts: 'continuity', 'sufficient cohesion', 'Grothendieck toposes'

- Text: We show that the answer is positive by building some examples.
- Concepts: None - there are no math concepts mentioned in this context.

- Text: We present a weak form of a recognition principle for Quillen model categories due to J.H
- Concepts: 'weak form', 'recognition principle', 'Quillen model categories'

- Text: Smith

- Concepts: There are no Math concepts mentioned in this context.

- Text: We use it to put a model category structure on the category of small categories enriched over a suitable monoidal simplicial model category
- Concepts: 'model category structure', 'category', 'small categories', 'enriched', 'monoidal', 'simplicial model category'

- Text: The proof uses a part of the model structure on small simplicial categories due to J
- Concepts: 'model structure', 'simplicial categories'

- Text: Bergner
- Concepts: 'Bergner' (Note: This is likely a reference to a person's name and not a math concept)

- Text: We give an application of the weak form of Smith's result to left Bousfield localizations of categories of monoids in a suitable monoidal model category.
- Concepts: 'left Bousfield localization', 'monoids', 'monoidal model category'

- Text: We show that the composition of a homotopically meaningful `geometric realization' (or simple functor) with the simplicial replacement produces all homotopy colimits and Kan extensions in a relative category which is closed under coproducts

- Concepts: 'homotopically meaningful', 'geometric realization', 'simple functor', 'simplicial replacement', 'homotopy colimits', 'Kan extensions', 'relative category', 'coproducts'

- Text: Examples (and its duals) include model categories, Δ-closed classes and other concrete examples such as complexes on (AB4) abelian categories, (filtered) commutative dg algebras and mixed Hodge complexes
- Concepts: 'model categories', 'Δ-closed classes', 'complexes', 'abelian categories', 'commutative dg algebras', 'mixed Hodge complexes'

- Text: The resulting homotopy colimits satisfy the expected properties as cofinality and Fubini, and are moreover colimits in a suitable 2-category of relative categories
- Concepts: 'homotopy colimits', 'cofinality', 'Fubini', '2-category', 'relative categories', 'colimits'

- Text: Conversely, the existence of homotopy colimits satisfying these properties guarantees that $hocolim_{\Delta^o}$ is a simple functor.
- Concepts: 'homotopy colimits', 'functor', 'simple functor'

- Text: We continue the development of the infinitesimal deformation theory of pasting diagrams of k-linear categories begun in TAC, Vol 22, #2
- Concepts: 'infinitesimal deformation theory', 'pasting diagrams', 'k-linear categories'

- Text: In that article the standard result that all obstructions are cocycles was established only for the elementary, composition-free parts of pasting diagrams
- Concepts: 'obstructions', 'cocycles', 'elementary parts', 'composition-free', 'pasting diagrams'

- Text: In the present work we give a proof for pasting diagrams in general
- Concepts: 'proof', 'pasting diagrams in general'

- Text: As tools we use the method developed by Shrestha of simultaneously representing formulas for obstructions, along with the corresponding cocycle and cobounding conditions by suitably labeled polygons, giving a rigorous exposition of the previously heuristic method; and deformations of pasting diagrams in which some cells are required to be deformed trivially.
- Concepts: formulas, obstructions, cocycle, cobounding conditions, labeled polygons, deformations, pasting diagrams, cells (note: while "trivially" is not a math concept, it is included as part of the context and may provide helpful context clues for understanding the problem)

- Text: We study the monoidal closed category of symmetric multicategories, especially in relation with its cartesian structure and with sequential multicategories (whose arrows are sequences of concurrent arrows in a given category)
- Concepts: 'monoidal closed category', 'symmetric multicategories', 'cartesian structure', 'sequential multicategories',

'arrows', 'concurrent arrows'

- Text: Then we consider cartesian multicategories in a similar perspective and develop some peculiar items such as algebraic products
- Concepts: 'cartesian multicategories', 'algebraic products'

- Text: Several classical facts arise as a consequence of this analysis when some of the multicategories involved are representable.
- Concepts: 'multicategories', 'representable'

- Text: In a paper of 1974, Brian Day employed a notion of factorization system in the context of enriched category theory, replacing the usual diagonal lifting property with a corresponding criterion phrased in terms of hom-objects
- Concepts: 'enriched category theory', 'factorization system', 'diagonal lifting property', 'hom-objects'

- Text: We set forth the basic theory of such enriched factorization systems
- Concepts: 'enriched', 'factorization systems'

- Text: In particular, we establish stability properties for enriched prefactorization systems, we examine the relation of enriched to ordinary factorization systems, and we provide general results for obtaining enriched factorizations by means of wide (co)intersections

- Concepts: enriched prefactorization systems', 'ordinary factorization systems', 'enriched factorizations', 'wide (co)intersections'

- Text: As a special case, we prove results on the existence of enriched factorization systems involving enriched strong monomorphisms or strong epimorphisms.
- Concepts: 'enriched factorization systems', 'enriched strong monomorphisms', 'strong epimorphisms'

- Text: Any functor from the category of C*-algebras to the category of locales that assigns to each commutative C*-algebra its Gelfand spectrum must be trivial on algebras of n-by-n matrices for $n \geq 3$
- Concepts: 'functor', 'category', 'C*-algebras', 'locales', 'commutative', 'Gelfand spectrum', 'algebras', 'n-by-n matrices'

- Text: This obstruction also applies to other spectra such as those named after Zariski, Stone, and Pierce
- Concepts: 'obstruction', 'spectra', 'Zariski', 'Stone', 'Pierce'

- Text: We extend these no-go results to functors with values in (ringed) topological spaces, (ringed) toposes, schemes, and quantales
- Concepts: functors, topological spaces, ringed spaces, toposes, schemes, quantales

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- Text: The possibility of spectra in other categories is discussed.
- Concepts: 'spectra', 'categories'

- Text: We introduce a category that represents varying risk as well as ambiguity
- Concepts: category', 'risk', 'ambiguity'

- Text: We give a generalized conditional expectation as a presheaf for this category, which not only works as a traditional conditional expectation given a σ-field but also is compatible with change of measure
- Concepts: 'generalized conditional expectation', 'presheaf', 'σ-field', 'change of measure'

- Text: Then, we reformulate dynamic monetary value measures as a presheaf for the category
- Concepts: 'dynamic monetary value measures', 'presheaf', 'category'

- Text: We show how some axioms of dynamic monetary value measures in the classical setting are deduced as theorems in the new formulation, which is evidence that the axioms are correct
- Concepts: 'dynamic monetary value measures', 'axioms', 'formulation', 'theorems'

- Text: Finally, we point out the possibility of giving a theoretical criteria with which we can pick up appropriate sets of axioms required for monetary value measures to be good, using a topology-as-axioms paradigm.

- Concepts: 'theoretical criteria', 'sets of axioms', 'monetary value measures', 'topology-as-axioms paradigm'

- Text: The coordinate projective line over a field is seen as a groupoid with a further `projection' structure
- Concepts: 'coordinate', 'projective line', 'field', 'groupoid', 'projection structure'

- Text: We investigate conversely to what extent such an, abstractly given, groupoid may be coordinatized by a suitable field constructed out of the geometry.
- Concepts: 'groupoid', 'coordinatized', 'field', 'geometry'

- Text: We give a new characterization of relative entropy, also known as the Kullback--Leibler divergence
- Concepts: 'relative entropy', 'Kullback-Leibler divergence'

- Text: We use a number of interesting categories related to probability theory
- Concepts: 'categories', 'probability theory'

- Text: In particular, we consider a category FinStat where an object is a finite set equipped with a probability distribution, while a morphism is a measure-preserving function $f \maps X \to Y$ together with a stochastic right inverse $s \maps Y \to X$
- Concepts: 'category', 'finite set', 'probability distribution', 'measure-preserving function', 'stochastic right inverse'

- Text: The function f can be thought of as a measurement process, while s provides a hypothesis about the state of the measured system given the result of a measurement
- Concepts: 'function', 'measurement process', 'hypothesis', 'state of the measured system', 'result of a measurement'

- Text: Given this data we can define the entropy of the probability distribution on X relative to the `prior' given by pushing the probability distribution on Y forwards along s
- Concepts: 'entropy', 'probability distribution', 'prior', 'pushing forward', 'function s'

- Text: We say that s is `optimal' if these distributions agree
- Concepts: optimal', 'distributions'

- Text: We show that any convex linear, lower semicontinuous functor from FinStat to the additive monoid $[0,\infty]$ which vanishes when s is optimal must be a scalar multiple of this relative entropy
- Concepts: convex, linear, lower semicontinuous, functor, FinStat, additive monoid, scalar, relative entropy, optimal

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- Text: Our proof is independent of all earlier characterizations, but inspired by the work of Petz.
- Concepts: 'proof', 'characterizations', 'work', 'Petz'

- Text: A notion of central importance in categorical topology is that of topological functor

- Concepts: 'categorical topology', 'topological functor'

- Text: A faithful functor $\cal E \to \cal B$ is called topological if it admits cartesian liftings of all (possibly large) families of arrows; the basic example is the forgetful functor $Top \to Set$
- Concepts: functor, cartesian liftings, topological, families of arrows, forgetful functor, Top, Set

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- Text: A topological functor $\cal E \to 1$ is the same thing as a (large) complete preorder, and the general topological functor $\cal E \to \cal B$ is intuitively thought of as a "complete preorder relative to $\cal B$"
- Concepts: 'topological functor', 'complete preorder', 'general topological functor', 'relative to $\cal B$'

- Text: We make this intuition precise by considering an enrichment base $\cal Q_\cal B$ such that $\cal Q_\cal B$-enriched categories are faithful functors into $\cal B$, and show that, in this context, a faithful functor is topological if and only if it is total (=totally cocomplete) in the sense of Street-Walters
- Concepts: 'enrichment base', '$\cal Q_\cal B$-enriched categories', 'faithful functors', 'topological', 'total', 'cocomplete', 'Street-Walters'

- Text: We also consider the MacNeille completion of a faithful functor to a topological one, first described by Herrlich, and show that it may be obtained as an instance of Isbell's generalised notion of MacNeille completion for enriched categories.

- Concepts: 'MacNeille completion', 'faithful functor', 'topological', 'Herrlich', 'Isbell', 'enriched categories'

- Text: We discuss various concepts of ∞-homotopies, as well as the relations between them (focussing on the Leibniz type)
- Concepts: '∞-homotopies', 'Leibniz type', 'relations'

- Text: In particular ∞-n-homotopies appear as the n-simplices of the nerve of a complete Lie ${\infty}$-algebra
- Concepts: '∞-n-homotopies', 'n-simplices', 'nerve', 'complete Lie ${\infty}$-algebra'

- Text: In the nilpotent case, this nerve is known to be a Kan complex
- Concepts: 'nilpotent', 'nerve', 'Kan complex'

- Text: We argue that there is a quasi-category of ∞-algebras and show that for truncated ∞-algebras, i.e
- Concepts: 'quasi-category', '∞-algebras', 'truncated ∞-algebras'

- Text: categorified algebras, this ∞-categorical structure projects to a strict 2-categorical one
- Concepts: 'categorified algebras', '∞-categorical structure', 'strict 2-categorical'

- Text: The paper contains a shortcut to $(\infty,1)$-categories, as well as a review of Getzler's proof of the Kan property
- Concepts: $(\infty,1)$-categories', 'shortcut', 'review', 'proof', 'Kan property'

- Text: We make the latter concrete by applying it to the 2-term ∞-algebra case, thus recovering the concept of homotopy of Baez and Crans, as well as the corresponding composition rule \cite{SS07}
- Concepts: '2-term ∞-algebra', 'homotopy', 'Baez', 'Crans', 'composition rule'

- Text: We also answer a question of Shoikhet about composition of ∞-homotopies of ∞-algebras.
- Concepts: '∞-homotopies', '∞-algebras', 'composition'

- Text: The aim of this series of papers is to develop a self-dual categorical approach to some topics in non-abelian algebra, which is based on replacing the framework of a category with that of a category equipped with a functor to it
- Concepts: 'category', 'non-abelian algebra', 'self-dual categorical approach', 'functor'

- Text: The present paper gives some preliminary steps in this direction, where several known structures on a category, which arise in the categorical treatment of these topics, are viewed as such functors; as a result, we obtain some new conceptual links between these structures.

- Concepts: 'category', 'categorical treatment', 'functors', 'conceptual links', 'structures'

- Text: The goal of this paper is to demystify the role played by the Reedy category axioms in homotopy theory
- Concepts: 'Reedy category axioms', 'homotopy theory'

- Text: With no assumed prerequisites beyond a healthy appetite for category theoretic arguments, we present streamlined proofs of a number of useful technical results, which are well known to folklore but difficult to find in the literature
- Concepts: 'category theoretic arguments', 'proofs', 'technical results', 'folklore', 'literature'

- Text: While the results presented here are not new, our approach to their proofs is somewhat novel
- Concepts: 'approach', 'proofs', 'novel' (no specific math concepts mentioned in this context)

- Text: Specifically, we reduce much of the hard work involved to simpler computations involving weighted colimits and Leibniz (pushout-product) constructions
- Concepts: 'weighted colimits', 'Leibniz', 'pushout-product constructions'

- Text: The general theory is developed in parallel with examples, which we use to prove that familiar formulae for homotopy limits and colimits indeed have the desired properties.

- Concepts: 'general theory', 'homotopy limits', 'colimits', 'formulae', 'properties'

- Text: This paper introduces the construction of a weakly globular double category of fractions for a category and studies its universal properties
- Concepts: 'weakly globular double category', 'category', 'fractions', 'universal properties'

- Text: It shows that this double category is locally small and considers a couple of concrete examples.
- Concepts: 'double category', 'locally small', 'concrete examples'

- Text: We develop a theory of twisted actions of categorical groups using a notion of semidirect product of categories
- Concepts: 'twisted actions', 'categorical groups', 'semidirect product', 'categories'

- Text: We work through numerous examples to demonstrate the power of these notions
- Concepts: 'examples', 'notions'

- Text: Turning to representations, which are actions that respect vector space structures, we establish an analog of Schur's lemma in this context
- Concepts: 'representations', 'vector space structures', 'Schur's lemma'

- Text: Keeping new terminology to a minimum, we concentrate on examples exploring the essential new notions introduced.
- Concepts: new terminology, examples, essential new notions

- Text: We define the analytic spectrum of a rig category $(A,\oplus,\otimes)$, and equip it with a sheaf of categories of rational functions
- Concepts: 'analytic spectrum', 'rig category', '+', '⊗', 'sheaf', 'categories of rational functions'

- Text: If the category is additive, we define a sheaf of categories of analytic functions
- Concepts: 'additive category', 'sheaf of categories', 'analytic functions'

- Text: We relate this construction to Berkovich's analytic spaces, to Durov's generalized schemes and to Haran's F-schemes
- Concepts: 'analytic spaces', 'generalized schemes', 'F-schemes'

- Text: We use these relations to define analytic versions of Arakelov compactifications of affine arithmetic varieties.
- Concepts: 'analytic', 'Arakelov compactifications', 'affine arithmetic varieties'

- Text: We define a mapping space for Gray-enriched categories adapted to higher gauge theory
- Concepts: 'mapping space', 'Gray-enriched categories', 'higher gauge theory'

- Text: Our construction differs significantly from the canonical mapping space of enriched categories in that it is much less rigid
- Concepts: 'construction', 'mapping space', 'enriched categories'

- Text: The two essential ingredients are a path space construction for Gray-categories and a kind of comonadic resolution of the 1-dimensional structure of a given Gray-category obtained by lifting the resolution of ordinary categories along the canonical fibration of GrayCat over Cat.
- Concepts: 'Gray-categories', 'path space construction', 'comonadic resolution', '1-dimensional structure', 'resolution of ordinary categories', 'canonical fibration', 'GrayCat', 'Cat'

- Text: We show that the adjunction between monoids and groups obtained via the Grothendieck group construction is admissible, relatively to surjective homomorphisms, in the sense of categorical Galois theory
- Concepts: 'adjunction', 'monoids', 'groups', 'Grothendieck group construction', 'admissible', 'surjective homomorphisms', 'categorical Galois theory'

- Text: The central extensions with respect to this Galois structure turn out to be the so-called special homogeneous surjections.
- Concepts: 'central extensions', 'Galois structure', 'special homogeneous surjections'

- Text: In an earlier work, we constructed the almost strict Morse n-category $\mathcal X$ which extends Cohen and Jones and

Segal's flow category

- Concepts: 'Morse n-category', 'flow category', 'Cohen-Jones extension'

- Text: In this article, we define two other almost strict n-categories $\mathcal V$ and $\mathcal W$ where $\mathcal V$ is based on homomorphisms between real vector spaces and $\mathcal W$ consists of tuples of positive integers
- Concepts: 'n-categories', 'strict n-categories', 'homomorphisms', 'real vector spaces', 'tuples', 'positive integers'

- Text: The Morse index and the dimension of the Morse moduli spaces give rise to almost strict n-category functors $\mathcal F : \mathcal X \to \mathcal V$ and $\mathcal G : \mathcal X \to \mathcal W$.
- Concepts: 'Morse index', 'dimension', 'Morse moduli spaces', 'n-category', 'functors'

- Text: We prove that a large class of natural transformations (consisting roughly of those constructed via composition from the ``functorial'' or ``base change'' transformations) between two functors of the form $..
- Concepts: natural transformations, functors, composition, base change

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- Text: f^* g_* ...$ actually has only one element, and thus that any diagram of such maps necessarily commutes
- Concepts: diagram, maps, commutes

- Text: We identify the precise axioms defining what we call a ``geofibered category'' that ensure that such a coherence theorem exists
- Concepts: 'axioms', 'geofibered category', 'coherence theorem'

- Text: Our results apply to all the usual sheaf-theoretic contexts of algebraic geometry
- Concepts: 'sheaf-theoretic', 'algebraic geometry'

- Text: The analogous result that would include any other of the six functors remains unknown.
- Concepts: six functors'

- Text: Counterexamples for Proposition~8.1 and Proposition~8.2 in the article Theor
- Concepts: 'Counterexamples', 'Proposition 8.1', 'Proposition 8.2'

- Text: Appl
- Concepts: None. The context provided ("Appl") is not related to any specific math concept or problem.

- Text: Categ
- Concepts: None - the context does not contain any information about Math concepts.

- Text: 25(2011), pp 295-341 are given
- Concepts: 25, 2011, pp, 295, 341

- Text: They are used in the paper only to prove Corollary~8.3
- Concepts: 'Corollary'

- Text: A proof of this corollary is given without them
- Concepts: 'proof', 'corollary'

- Text: The proof of the fibrancy of some cubical transition systems is fixed.
- Concepts: 'proof', 'fibrancy', 'cubical transition systems'

- Text: It is proved that in any pointed category with pullbacks, coequalizers and regular epi-mono factorizations, the class of regular epimorphisms is stable under pullback along the so-called balanced effective descent morphisms
- Concepts: 'pointed category', 'pullbacks', 'coequalizers', 'regular epi-mono factorizations', 'regular epimorphisms', 'balanced effective descent morphisms'

- Text: Here ``balanced'' can be omitted if the category is additive
- Concepts: 'balanced', 'category', 'additive'

- Text: A balanced effective descent morphism is defined as an effective descent morphism $p:E\rightarrow B$ such that any subobject of E is a pullback of some morphism along p
- Concepts: 'effective descent morphism', 'subobject', 'pullback', 'morphism'

- Text: It is shown that, in any category with pullbacks and coequalizers, the class of effective descent morphisms is stable under pushout if and only if any regular epimorphism is an effective descent morphism
- Concepts: category, pullbacks, coequalizers, effective descent morphisms, pushout, regular epimorphism

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- Text: Moreover, it is shown that the class of descent morphisms is stable under pushout if and only if the class of regular epimorphisms is stable under pullback.
- Concepts: 'descent morphisms', 'class', 'stable', 'pushout', 'regular epimorphisms', 'pullback'

- Text: To 2-categorify the theory of group representations, we introduce the notions of the 3-representation of a group in a strict 3-category and the strict 2-categorical action of a group on a strict 2-category
- Concepts: '2-categorify', 'theory of group representations', '3-representation', 'group', 'strict 3-category', 'strict 2-categorical action', 'strict 2-category'

- Text: We also 2-categorify the concept of the trace by introducing the 2-categorical trace of a 1-endomorphism in a strict 3-category
- Concepts: 'trace', '2-categorify', '2-categorical', '1-endomorphism', 'strict 3-category'

- Text: For a 3-representation ρ of a group G and an element f of G, the 2-categorical trace $Tr_2\rho_f$ is a category

- Concepts: '3-representation', 'group', 'element', '2-categorical trace', 'category'

- Text: Moreover, the centralizer of f in G acts categorically on this 2-categorical trace
- Concepts: 'centralizer', 'G', '2-categorical trace'

- Text: We construct the induced strict 2-categorical action of a finite group, and show that the 2-categorical trace Tr_2 takes an induced strict 2-categorical action into an induced categorical action of the initia groupoid
- Concepts: 'strict 2-categorical', 'finite group', '2-categorical action', '2-categorical trace', 'induced strict 2-categorical action', 'categorical action', 'initial groupoid'

- Text: As a corollary, we get the 3-character formula of the induced strict 2-categorical action.
- Concepts: 'corollary', 'induced', 'strict 2-categorical action'

- Text: It is well known that profinite T_0-spaces are exactly the spectral spaces
- Concepts: 'profinite', 'T_0-spaces', 'spectral spaces'

- Text: We generalize this result to the category of all topological spaces by showing that the following conditions are equivalent: (1) (X,τ) is a profinite topological space
- Concepts: 'generalize', 'category', 'topological spaces', 'profinite topological space'

- Text: (2) The T_0-reflection of (X,τ) is a profinite T_0-space
- Concepts: T_0-reflection, profinite, T_0-space

- Text: (3) (X,τ) is a quasi spectral space
- Concepts: quasi spectral space'

- Text: (4) (X,τ) admits a stronger Stone topology π such that (X, τ,π) is a bitopological quasi spectral space
- Concepts: Stone topology, bitopological, quasi spectral space

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- Text: We introduce the notion of mutation pairs in pseudo-triangulated categories
- Concepts: pseudo-triangulated categories', 'mutation pairs'

- Text: Given such a mutation pair, we prove that the corresponding quotient category carries a natural triangulated structure under certain conditions
- Concepts: mutation pair', 'quotient category', 'triangulated structure', 'natural'

- Text: This result unifies many previous constructions of quotient triangulated categories.
- Concepts: 'quotient triangulated categories'

- Text: We survey the general theory of groupoids, groupoid actions, groupoid principal bundles, and various kinds of morphisms between groupoids in the framework of categories with pretopology

- Concepts: 'groupoids', 'groupoid actions', 'groupoid principal bundles', 'morphisms', 'categories', 'pretopology'

- Text: The categories of topological spaces and finite or infinite dimensional manifolds are examples of such categories
- Concepts: 'topological spaces', 'finite dimensional manifolds', 'infinite dimensional manifolds', 'categories'

- Text: We study extra assumptions on pretopologies that are needed for this theory
- Concepts: pretopologies, theory

- Text: We check these extra assumptions in several categories with pretopologies. Functors between groupoids may be localised at equivalences in two ways
- Concepts: 'categories with pretopologies', 'functors', 'groupoids', 'localised', 'equivalences'

- Text: One uses spans of functors, the other bibundles (commuting actions) of groupoids
- Concepts: spans of functors', 'bibundles', 'commuting actions', 'groupoids'

- Text: We show that both approaches give equivalent bicategories
- Concepts: 'equivalent', 'bicategories'

- Text: Another type of groupoid morphism, called an actor, is closely related to functors between the categories of groupoid actions
- Concepts: 'groupoid morphism', 'actor', 'functors', 'categories', 'groupoid actions'

- Text: We also generalise actors using bibundles, and show that this gives another bicategory of groupoids.
- Concepts: 'bibundles', 'bicategory', 'groupoids'

- Text: We call a finitely complete category algebraically coherent if the change-of-base functors of its fibration of points are coherent, which means that they preserve finite limits and jointly strongly epimorphic pairs of arrows
- Concepts: 'finitely complete category', 'algebraically coherent', 'change-of-base functors', 'fibration of points', 'coherent', 'finite limits', 'jointly strongly epimorphic pairs of arrows'

- Text: We give examples of categories satisfying this condition; for instance, coherent categories and categories of interest in the sense of Orzech
- Concepts: 'categories', 'coherent categories', 'categories of interest', 'Orzech'

- Text: We study equivalent conditions in the context of semi-abelian categories, as well as some of its consequences: including amongst others, strong protomodularity, and normality of Higgins commutators for normal subobjects, and in the varietal case, fibre-wise algebraic cartesian closedness.

- Concepts: 'semi-abelian categories', 'strong protomodularity', 'normality', 'Higgins commutators', 'subobjects', 'varietal', 'fibre-wise algebraic', 'cartesian closedness'

- Text: In this paper, we use the language of operads to study open dynamical systems
- Concepts: operads', 'open dynamical systems'

- Text: More specifically, we study the algebraic nature of assembling complex dynamical systems from an interconnection of simpler ones
- Concepts: 'algebraic nature', 'complex dynamical systems', 'interconnection', 'simpler ones'

- Text: The syntactic architecture of such interconnections is encoded using the visual language of wiring diagrams
- Concepts: 'syntactic architecture', 'interconnections', 'visual language', 'wiring diagrams'

- Text: We define the symmetric monoidal category W, from which we may construct an operad OW, whose objects are black boxes with input and output ports, and whose morphisms are wiring diagrams, thus prescribing the algebraic rules for interconnection
- Concepts: 'symmetric monoidal category', 'operad', 'black boxes', 'input ports', 'output ports', 'morphisms', 'wiring diagrams', 'algebraic rules', 'interconnection'

- Text: We then define two W-algebras} G and L, which associate semantic content to the structures in W
- Concepts: 'W-algebras', 'semantic content', 'structures'

- Text: Respectively, they correspond to general and to linear systems of differential equations, in which an internal state is controlled by inputs and produces outputs
- Concepts: 'differential equations', 'linear systems', 'internal state', 'inputs', 'outputs'

- Text: As an example, we use these algebras to formalize the classical problem of systems of tanks interconnected by pipes, and hence make explicit the algebraic relationships among systems at different levels of granularity.
- Concepts: 'algebras', 'systems', 'tanks', 'pipes', 'algebraic relationships', 'granularity'

- Text: Inspired by recent work of Batanin and Berger on the homotopy theory of operads, a general monad-theoretic context for speaking about structures within structures is presented, and the problem of constructing the universal ambient structure containing the prescribed internal structure is studied
- Concepts: homotopy theory, operads, monad-theoretic context, structures within structures, universal ambient structure, internal structure

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- Text: Following the work of Lack, these universal objects must be constructed from simplicial objects arising from our monad-theoretic framework, as certain 2-categorical colimits called codescent objects

- Concepts: 'simplicial objects', 'monad-theoretic framework', '2-categorical colimits', 'codescent objects'

- Text: We isolate the extra structure present on these simplicial objects which enable their codescent objects to be computed
- Concepts: 'simplicial objects', 'codescent objects'

- Text: These are the crossed internal categories of the title, and generalise the crossed simplicial groups of Loday and Fiedorowicz
- Concepts: 'crossed internal categories', 'crossed simplicial groups', 'Loday', 'Fiedorowicz'

- Text: The most general results of this article are concerned with how to compute such codescent objects in 2-categories of internal categories, and on isolating conditions on the monad-theoretic situation which enable these results to apply
- Concepts: 'codescent objects', '2-categories', 'internal categories', 'monad-theoretic situation'

- Text: Combined with earlier work of the author in which operads are seen as polynomial 2-monads, our results are then applied to the theory of non-symmetric, symmetric and braided operads
- Concepts: 'operads', 'polynomial 2-monads', 'non-symmetric operads', 'symmetric operads', 'braided operads'

- Text: In particular, the well-known construction of a PROP from an operad is recovered, as an illustration of our techniques.
- Concepts: 'construction', 'PROP', 'operad', 'techniques'

- Text: We show that the category of abstract elementary classes (AECs) and concrete functors is closed under constructions of ``limit type,'' which generalizes the approach of Mariano, Zambrano and Villaveces away from the syntactically oriented framework of institutions
- Concepts: 'category', 'abstract elementary classes', 'concrete functors', 'limit type', 'generalizes', 'approach', 'syntactically oriented framework', 'institutions'

- Text: Moreover, we provide a broader view of this closure phenomenon, considering a variety of categories of accessible categories with additional structure, and relaxing the assumption that the morphisms be concrete functors.
- Concepts: 'closure phenomenon', 'categories', 'accessible categories', 'additional structure', 'morphisms', 'concrete functors'

- Text: In this article we give a construction of a polynomial 2-monad from an operad and describe the algebras of the 2-monads which then arise
- Concepts: 'polynomial', '2-monad', 'operad', 'algebras'

- Text: This construction is different from the standard construction of a monad from an operad in that the algebras of our associated 2-monad are the categorified algebras of the original operad

- Concepts: 'construction', 'monad', 'operad', '2-monad', 'categorified algebras'

- Text: Moreover it enables us to characterise operads as categorical polynomial monads in a canonical way
- Concepts: 'operads', 'categorical', 'polynomial monads', 'canonical'

- Text: This point of view reveals categorical polynomial monads as a unifying environment for operads, Cat-operads and clubs
- Concepts: 'categorical polynomial monads', 'operads', 'Cat-operads', 'clubs'

- Text: We recover the standard construction of a monad from an operad in a 2-categorical way from our associated 2-monad as a coidentifier of 2-monads, and understand the algebras of both as weak morphisms of operads into a Cat-operad of categories
- Concepts: 'monad', 'operad', '2-categorical', '2-monad', 'coidentifier', 'algebras', 'weak morphisms', 'Cat-operad', 'categories'

- Text: Algebras of operads within general symmetric monoidal categories arise from our new associated 2-monad in a canonical way
- Concepts: 'operads', 'symmetric monoidal categories', '2-monad'

- Text: When the operad is sigma-free, we establish a Quillen equivalence, with respect to the model structures on algebras of

2-monads found by Lack, between the strict algebras of our associated 2-monad, and those of the standard one.

- Concepts: 'operad', 'sigma-free', 'Quillen equivalence', 'model structures', 'algebras', '2-monads', 'strict algebras', 'standard one'

- Text: For any total category K, with defining adjunction $\sup \ladj Y : K \rightarrow set^{K^{op}}$, the expression $W(a)(k)= set^{set^{K^{op}}}(K(a,\sup -),[k,-])$, where $[k,-]$ is evaluation at k, provides a well-defined functor $W : K \rightarrow \hat{K} = set^{K^{op}}$
- Concepts: 'total category', 'defining adjunction', 'functor', 'evaluation', 'opposite category'

- Text: Also, there are natural transformations $\beta : W\sup \rightarrow 1_{\hat{K}}$ and $\gamma : \sup W \rightarrow 1_K$ satisfying $\sup\beta =\gamma\sup$ and $\beta W =W\gamma$
- Concepts: natural transformations, functor, composition

- Text: A total K is totally distributive if $\sup$ has a left adjoint
- Concepts: 'total', 'totally distributive', 'sup', 'left adjoint'

- Text: We show that K is totally distributive iff γ is invertible iff $W \ladj \sup$
- Concepts: 'totally distributive', 'invertible', 'adjoint', 'sup'

- Text: The elements of $W(a)(k)$ are called waves from k to a. Write $\tilde{K}(k,a)$ for $W(a)(k)$
- Concepts: elements, waves, $W(a)(k)$, $\tilde{K}(k,a)$

- Text: For any total K there is an associative composition of waves
- Concepts: 'associative composition', 'waves'

- Text: Composition becomes an arrow $\bullet : \tilde{K}\circ_{K}\tilde{K} \rightarrow \tilde{K}$
- Concepts: 'Composition', 'arrow', 'tilde', 'K'

- Text: Also, there is an augmentation $\tilde{K}(-,-) \rightarrow K(-,-)$ corresponding to a natural $\delta : W \rightarrow Y$ constructed via β
- Concepts: 'augmentation', 'natural', 'δ', 'W', 'Y', 'β'

- Text: We show that if K is totally distributive then $\bullet$ is invertible and then $\tilde{K}$ supports an idempotent comonad structure
- Concepts: 'totally distributive', '$\bullet$ is invertible', '$\tilde{K}$', 'idempotent comonad structure'

- Text: In fact, $\tilde{K} \circ_{K} \tilde{K} = \tilde{K} \circ_{\tilde{K}} \tilde{K}$ so that $\bullet$ is the coequalizer of $\bullet K$ and $K \bullet$, making $\tilde{K}$ a taxon in the sense of Koslowski
- Concepts: coequalizer, taxon, Koslowski

- Text: For a small taxon T, the category of interpolative modules $iMod(1,T)$ is totally distributive

- Concepts: 'taxon', 'interpolative modules', 'category', 'totally distributive'

- Text: Here we show, for any totally distributive K, that there is an equivalence $K \rightarrow iMod(1,\tilde{K})$.
- Concepts: 'totally distributive', 'equivalence', 'iMod', '1', '$\tilde{K}$'

- Text: We show that morphisms from n homotopy unital A_∞-algebras to a single one are maps over an operad module with n+1 commuting actions of the operad $A_\infty^\hu$, whose algebras are homotopy unital A_∞-algebras
- Concepts: A_∞-algebras, operad module, operad $A_\infty^\hu$, homotopy unital

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- Text: The operad A_∞ and modules over it have two useful gradings related by isomorphisms which change the degree
- Concepts: 'operad', 'modules', 'gradings', 'isomorphisms', 'degree'

- Text: The composition of $A_\infty^\hu$\n-morphisms with several entries is presented as a convolution of a coalgebra-like and an algebra-like structures.
- Concepts: '$A_\infty^\hu$\n-morphisms', 'convolution', 'coalgebra-like structure', 'algebra-like structure'

- Text: We show that morphisms from n A_∞-algebras to a single one are maps over an operad module with n+1 commuting actions of the operad A_∞, whose algebras are conventional A_∞-algebras

- Concepts: 'morphisms', 'operad module', 'A_\infty', 'algebras', 'conventional A_∞-algebras'

- Text: The composition of A_∞-morphisms with several entries is presented as a convolution of a coalgebra-like and an algebra-like structures
- Concepts: A_∞-morphisms, composition, convolution, coalgebra-like, algebra-like

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- Text: Under these notions lie two examples of Cat-operads: that of graded modules and of complexes.
- Concepts: 'Cat-operads', 'graded modules', 'complexes'

- Text: We generalize the concept of a strong inclusion on a biframe to that of a proximity on a biframe, which is related to the concept of a strong bi-inclusion on a frame introduced by Picado and Pultr
- Concepts: 'generalize', 'strong inclusion', 'biframe', 'proximity', 'strong bi-inclusion', 'frame'

- Text: We also generalize the concept of a bi-compactification of a biframe to that of a compactification of a biframe, and prove that the poset of compactifications of a biframe L is isomorphic to the poset of proximities on L
- Concepts: 'bi-compactification', 'biframe', 'compactification', 'poset', 'proximities'

- Text: As a corollary, we obtain Schauerte's characterization of bi-compactifications of a biframe
- Concepts: 'corollary', 'bi-compactifications', 'biframe'

- Text: In the spatial case this yields Blatter and Seever's characterization of compactifications of completely regular ordered spaces and a characterization of bi-compactifications of completely regular bispaces.
- Concepts: 'completely regular', 'ordered space', 'compactifications', 'bi-compactifications', 'completely regular bispaces'

- Text: Transformation groupoids associated to group actions capture the interplay between global and local symmetries of structures described in set-theoretic terms
- Concepts: 'transformation groupoids', 'group actions', 'global symmetries', 'local symmetries', 'set-theoretic terms'

- Text: This paper examines the analogous situation for structures described in category-theoretic terms, where symmetry is expressed as the action of a 2-group G (equivalently, a categorical group) on a category C
- Concepts: 'category-theoretic terms', '2-group', 'categorical group', 'category C'

- Text: It describes the construction of a transformation groupoid in diagrammatic terms, and considers this construction internal to Cat, the category of categories

- Concepts: 'transformation groupoid', 'diagrammatic terms', 'internal', 'category', 'categories'

- Text: The result is a double category C//G which describes the local symmetries of C
- Concepts: 'double category', 'local symmetries'

- Text: We define this and describe some of its structure, with the adjoint action of G on itself as a guiding example.
- Concepts: 'adjoint action', 'structure'

- Text: There are few known computable examples of non-abelian surface holonomy
- Concepts: 'computable examples', 'non-abelian', 'surface holonomy'

- Text: In this paper, we give several examples whose structure 2-groups are covering 2-groups and show that the surface holonomies can be computed via a simple formula in terms of paths of 1-dimensional holonomies inspired by earlier work of Chan Hong-Mo and Tsou Sheung Tsun on magnetic monopoles
- Concepts: 'structure 2-groups', 'covering 2-groups', 'surface holonomies', 'formula', 'paths', '1-dimensional holonomies', 'magnetic monopoles'

- Text: As a consequence of our work and that of Schreiber and Waldorf, this formula gives a rigorous meaning to non-abelian magnetic flux for magnetic monopoles

- Concepts: 'non-abelian', 'magnetic flux', 'magnetic monopoles'

- Text: In the process, we discuss gauge covariance of surface holonomies for spheres for any 2-group, therefore generalizing the notion of the reduced group introduced by Schreiber and Waldorf
- Concepts: 'surface holonomies', '2-group', 'reduced group'

- Text: Using these ideas, we also prove that magnetic monopoles form an abelian group.
- Concepts: 'magnetic monopoles', 'abelian group'

- Text: We introduce a 3-dimensional categorical structure which we call intercategory
- Concepts: 3-dimensional categorical structure', 'intercategory'

- Text: This is a kind of weak triple category with three kinds of arrows, three kinds of 2-dimensional cells and one kind of 3-dimensional cells
- Concepts: 'weak triple category', 'arrows', '2-dimensional cells', '3-dimensional cells'

- Text: In one dimension, the compositions are strictly associative and unitary, whereas in the other two, these laws only hold up to coherent isomorphism
- Concepts: dimension, compositions, associative, unitary, coherent isomorphism

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- Text: The main feature is that the interchange law between the second and third compositions does not hold, but rather there is a non-invertible comparison cell which satisfies some coherence conditions
- Concepts: 'interchange law', 'compositions', 'comparison cell', 'coherence conditions'

- Text: We introduce appropriate morphisms of intercategory, of which there are three types, and cells relating these
- Concepts: 'intercategory', 'morphisms', 'cells'

- Text: We show that these fit together to produce a strict triple category of intercategories.
- Concepts: 'strict triple category', 'intercategories'

- Text: We show that ann-categories admit a presentation by crossed bimodules, and prove that morphisms between them can be expressed by special kinds spans between the presentations
- Concepts: ann-categories', 'presentation', 'crossed bimodules', 'morphisms', 'spans'

- Text: More precisely, we prove the groupoid of morphisms between two ann-categories is equivalent to that of bimodule butterflies between the presentations
- Concepts: 'groupoid', 'morphisms', 'ann-categories', 'bimodule butterflies', 'presentations'

- Text: A bimodule butterfly is a specialization of a butterfly, i.e

- Concepts: 'bimodule butterfly', 'specialization', 'butterfly'

- Text: a special kind of span or fraction, between the underlying complexes
- Concepts: 'underlying complexes', 'span', 'fraction'

- Text: In this paper, we unify various approaches to generalized covering space theory by introducing a categorical framework in which coverings are defined purely in terms of unique lifting properties
- Concepts: 'generalized covering space theory', 'categorical framework', 'coverings', 'unique lifting properties'

- Text: For each category C of path-connected spaces having the unit disk as an object, we construct a category of C-coverings over a given space X that embeds in the category of $\pi_1(X,x_0)$-sets via the usual monodromy action on fibers
- Concepts: 'category', 'path-connected spaces', 'unit disk', 'C-coverings', 'category of C-coverings', 'embedding', '$\pi_1(X,x_0)$-sets', 'monodromy action', 'fibers'

- Text: When C is extended to its coreflective hull H(C), the resulting category of based H(C)-coverings is complete, has an initial object, and often characterizes more of the subgroup lattice of $\pi_1(X,x_0)$ than traditional covering spaces
- Concepts: 'coreflective hull', 'based coverings', 'complete', 'initial object', 'subgroup lattice', '$\pi_1(X,x_0)$', 'traditional covering spaces'

- Text: We apply our results to three special coreflective subcategories: (1) The category of Δ-coverings employs the convenient category of Δ-generated spaces and is universal in the sense that it contains every other generalized covering category as a subcategory
- Concepts: 'category', 'Δ-coverings', 'Δ-generated spaces', 'universal', 'generalized covering category', 'coreflective subcategories'

- Text: (2) In the locally path-connected category, we preserve notion of generalized covering due to Fischer and Zastrow and characterize the topology of such coverings using the standard whisker topology
- Concepts: 'locally path-connected category', 'generalized covering', 'Fischer and Zastrow', 'characterize', 'topology', 'whisker topology'

- Text: (3) By employing the coreflective hull Fan of the category of all contractible spaces, we characterize the notion of continuous lifting of paths and identify the topology of Fan-coverings as the natural quotient topology inherited from the path space.
- Concepts: 'coreflective hull', 'category', 'contractible spaces', 'continuous lifting', 'paths', 'topology', 'Fan-coverings', 'quotient topology', 'path space'

- Text: This is the third paper in a series
- Concepts: none (there are no math concepts mentioned in this context)

- Text: In it we construct a C-system CC(C,p) starting from a category C together with a morphism $p:\tilde{U} \to U$, a choice of pull-back squares based on p for all morphisms to U and a choice of a final object of C
- Concepts: 'C-system', 'category', 'morphism', 'pull-back square', 'final object'

- Text: Such a quadruple is called a universe category
- Concepts: quadruple', 'universe category'

- Text: We then define universe category functors and construct homomorphisms of C-systems CC(C,p) defined by universe category functors
- Concepts: 'universe category', 'functors', 'homomorphisms', 'C-systems'

- Text: In the sections before the last section we give, for any C-system CC, three different constructions of pairs ((C,p),H) where (C,p) is a universe category and $H : CC \to CC(C,p)$ is an isomorphism
- Concepts: C-system, universe category, isomorphism

- Text: In the last section we construct for any (set) category C with a choice of a final object and fiber products a C-system and an equivalence between C and the precategory underlying CC.
- Concepts: 'set category', 'final object', 'fiber products', 'C-system', 'equivalence', 'precategory', 'underlying CC'

- Text: The purpose of this note is to understand the two out of three property of the model category in terms of the weak factorization systems
- Concepts: 'model category', 'weak factorization systems', 'two out of three property'

- Text: We will show that if a category with classes of trivial cofibrations, cofibrations, trivial fibrations, and fibrations is given a simplicial structure similar to that of the simplicial model category, then the full subcategory of cofibrant and fibrant objects has the two out of three property, and we will give a list of necessary and sufficient conditions in terms of the simplicial structure for the associated canonical "weak equivalence class" to have the two out of three property.
- Concepts: 'category', 'trivial cofibrations', 'cofibrations', 'trivial fibrations', 'fibrations', 'simplicial structure', 'simplicial model category', 'cofibrant objects', 'fibrant objects', 'two out of three property', 'weak equivalence class', 'necessary conditions', 'sufficient conditions'

- Text: We study transport of algebraic structures and prove a theorem which subsumes results of Comfort and Ross on topological group structures on Stone-Cech compactifications, of Chevalley and of Gil de Lamadrid and Jans on topological group and ring structures on universal covering spaces, and of Gleason on topological group structures on universal locally connected refinements.

- Concepts: 'transport of algebraic structures', 'theorem', 'topological group structure', 'Stone-Cech compactifications', 'Chevalley', 'Gil de Lamadrid', 'Jans', 'universal covering spaces', 'Gleason', 'universal locally connected refinements'

- Text: Let C be a category with finite colimits, writing its coproduct +, and let $(D, \otimes)$ be a braided monoidal category
- Concepts: 'category', 'finite colimits', 'coproduct', 'braided monoidal category'

- Text: We describe a method of producing a symmetric monoidal category from a lax braided monoidal functor $F : (C,+) \to (D, \otimes)$, and of producing a strong monoidal functor between such categories from a monoidal natural transformation between such functors
- Concepts: symmetric monoidal category', 'lax braided monoidal functor', 'strong monoidal functor', 'monoidal natural transformation'

- Text: The objects of these categories, our so-called `decorated cospan categories', are simply the objects of C, while the morphisms are pairs comprising a cospan $X \rightarrow N \leftarrow Y$ in C together with an element $1 \to FN$ in D
- Concepts: 'categories', 'cospan', 'objects', 'morphisms', 'element'

- Text: Moreover, decorated cospan categories are hypergraph categories - each object is equipped with a special commutative

Frobenius monoid - and their functors preserve this structure.

- Concepts: decorated cospan categories', 'hypergraph categories', 'commutative Frobenius monoid', 'functors', 'preserve', 'structure'

- Text: Given a monad and a comonad, one obtains a distributive law between them from lifts of one through an adjunction for the other
- Concepts: monad, comonad, distributive law, lifts, adjunction

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- Text: In particular, this yields for any bialgebroid the Yetter-Drinfel'd distributive law between the comonad given by a module coalgebra and the monad given by a comodule algebra
- Concepts: 'bialgebroid', 'Yetter-Drinfel'd distributive law', 'comonad', 'module coalgebra', 'monad', 'comodule algebra'

- Text: It is this self-dual setting that reproduces the cyclic homology of associative and of Hopf algebras in the monadic framework of Böhm and Stefan
- Concepts: 'self-dual setting', 'cyclic homology', 'associative algebra', 'Hopf algebra', 'monadic framework'

- Text: In fact, their approach generates two duplicial objects and morphisms between them which are mutual inverses if and only if the duplicial objects are cyclic
- Concepts: 'duplicial objects', 'morphisms', 'mutual inverses', 'cyclic'

- Text: A 2-categorical perspective on the process of twisting coefficients is provided and the role of the two notions of bimonad studied in the literature is clarified.
- Concepts: '2-categorical perspective', 'twisting coefficients', 'notions of bimonad'

- Text: An arbitrary Lie groupoid gives rise to a groupoid of germs of local diffeomorphisms over its base manifold, known as its effect
- Concepts: 'Lie groupoid', 'groupoid', 'germs', 'local diffeomorphisms', 'base manifold', 'effect'

- Text: The effect of any bundle of Lie groups is trivial
- Concepts: 'bundle', 'Lie groups', 'trivial'

- Text: All quotients of a given Lie groupoid determine the same effect
- Concepts: 'Lie groupoid', 'quotients'

- Text: It is natural to regard the effects of any two Morita equivalent Lie groupoids as being ``equivalent''
- Concepts: 'Morita equivalent', 'Lie groupoids', 'equivalent'

- Text: In this paper we shall describe a systematic way of comparing the effects of different Lie groupoids
- Concepts: 'Lie groupoids'

- Text: In particular, we shall rigorously define what it means for two arbitrary Lie groupoids to give rise to ``equivalent'' effects
- Concepts: 'Lie groupoids', 'equivalent effects'

- Text: For effective orbifold groupoids, the new notion of equivalence turns out to coincide with the traditional notion of Morita equivalence
- Concepts: 'orbifold groupoids', 'equivalence', 'traditional notion', 'Morita equivalence'

- Text: Our analysis is relevant to the presentation theory of proper smooth stacks.
- Concepts: 'analysis', 'presentation theory', 'proper smooth stacks'

- Text: This paper extends the Day Reflection Theorem to skew monoidal categories
- Concepts: Day Reflection Theorem', 'skew monoidal categories'

- Text: We also provide conditions under which a skew monoidal structure can be lifted to the category of Eilenberg-Moore coalgebras for a comonad.
- Concepts: 'skew monoidal structure', 'category', 'Eilenberg-Moore coalgebras', 'comonad'

- Text: Let C be a finite category
- Concepts: 'finite category'

- Text: For an object X of C one has the hom-functor Hom(-,X) of C to Set
- Concepts: object, hom-functor, Set

- Text: If G is a subgroup of Aut(X), one has the quotient functor Hom(-,X)/G
- Concepts: subgroup, Aut(X), quotient functor, Hom(-,X)

- Text: We show that any finite product of hom-functors of C is a sum of hom-functors if and only if C has pushouts and coequalizers and that any finite product of hom-functors of C is a sum of functors of the form \Hom(-,X)/G if and only if C has pushouts
- Concepts: 'hom-functors', 'finite product', 'sum of hom-functors', 'pushouts', 'coequalizers', 'functors', '\Hom(-,X)/G'

- Text: These are variations of the fact that a finite category has products if and only if it has coproducts.
- Concepts: 'finite category', 'products', 'coproducts'

- Text: We show that for a differential graded Lie algebra g whose components vanish in degrees below -1 the nerve of the Deligne 2-groupoid is homotopy equivalent to the simplicial set of g-valued differential forms introduced by V.~Hinich.
- Concepts: 'differential graded Lie algebra', 'Deligne 2-groupoid', 'homotopy equivalent', 'simplicial set', 'g-valued differential forms'

- Text: We introduce the second cohomology categorical group of a categorical group G with coefficients in a symmetric G-categorical group and we show that it classifies extensions of G with symmetric kernel and a functorial section
- Concepts: 'cohomology', 'categorical group', 'symmetric group', 'extensions', 'functorial section', 'kernel'

- Text: Moreover, from an essentially surjective homomorphism of categorical groups we get 2-exact sequences a la Hochschild-Serre connecting the categorical groups of derivations and the first and the second cohomology categorical groups.
- Concepts: 'categorical groups', 'homomorphism', 'derivations', 'cohomology', 'Hochschild-Serre', '2-exact sequences', 'first cohomology', 'second cohomology'

- Text: The "linear dual" of a cocomplete linear category C is the category of all cocontinuous linear functors $C \to Vect$
- Concepts: 'linear category', 'cocomplete', 'linear functors', 'cocontinuous', 'Vect'

- Text: We study the questions of when a cocomplete linear category is reflexive (equivalent to its double dual) or dualizable (the pairing with its dual comes with a corresponding copairing)
- Concepts: 'cocomplete', 'linear category', 'reflexive', 'double dual', 'dualizable', 'pairing', 'dual', 'copairing'

- Text: Our main results are that the category of comodules for a countable-dimensional coassociative coalgebra is always reflexive, but (without any dimension hypothesis) dualizable if and only if it has enough projectives, which rarely happens

- Concepts: 'comodules', 'coassociative coalgebra', 'reflexive', 'dualizable', 'enough projectives'

- Text: Along the way, we prove that the category $QCoh(X)$ of quasi-coherent sheaves on a stack X is not dualizable if X is the classifying stack of a semisimple algebraic group in positive characteristic or if X is a scheme containing a closed projective subscheme of positive dimension, but is dualizable if X is the quotient of an affine scheme by a virtually linearly reductive group
- Concepts: 'category', 'quasi-coherent sheaves', 'stack', 'dualizable', 'classifying stack', 'semisimple algebraic group', 'positive characteristic', 'scheme', 'closed projective subscheme', 'quotient', 'affine scheme', 'virtually linearly reductive group'

- Text: Finally we prove tensoriality (a type of Tannakian duality) for affine ind-schemes with countable indexing poset.
- Concepts: 'tensoriality', 'Tannakian duality', 'affine ind-schemes', 'countable indexing poset'

- Text: We introduce an apparent strengthening of Sufficient Cohesion that we call Stable Connected Codiscreteness (SCC) and show that if $p: E --> S$ is cohesive and satisfies SCC then the internal axiom of choice holds in S
- Concepts: 'Sufficient Cohesion', 'Stable Connected Codiscreteness', 'cohesive', 'internal axiom of choice'

- Text: Moreover, in this case, $p^!: S --> E$ is equivalent to the inclusion $E_{\neg\neg} --> E$.
- Concepts: $p^!$, inclusion, equivalence

- Text: The existence of the split extension classifier of a crossed module in the category of associative algebras is investigated
- Concepts: 'crossed module', 'split extension classifier', 'category', 'associative algebras'

- Text: According to the equivalence of categories $XAss \simeq Cat^1-Ass$ we consider this problem in Cat^1-Ass
- Concepts: 'equivalence of categories', 'XAss', 'Cat^1-Ass', 'problem'

- Text: This category is not a category of interest, it satisfies its all axioms except one
- Concepts: 'category', 'axioms'

- Text: The action theory developed in the category of interest is adapted to the new type of category, which will be called modified category of interest
- Concepts: 'action theory', 'category of interest', 'modified category of interest'

- Text: Applying the results obtained in this direction and the equivalence of categories we find a condition under which there exists the split extension classifier of a crossed module and give the corresponding construction.

- Concepts: 'equivalence of categories', 'split extension classifier', 'crossed module', 'construction'

- Text: Control theory uses `signal-flow diagrams' to describe processes where real-valued functions of time are added, multiplied by scalars, differentiated and integrated, duplicated and deleted
- Concepts: 'Control theory', 'signal-flow diagrams', 'real-valued functions', 'time', 'adding', 'multiplying by scalars', 'differentiation', 'integration', 'duplicating', 'deleting'

- Text: These diagrams can be seen as string diagrams for the symmetric monoidal category FinVectk of finite-dimensional vector spaces over the field of rational functions k = R(s), where the variable s acts as differentiation and the monoidal structure is direct sum rather than the usual tensor product of vector spaces
- Concepts: 'string diagrams', 'symmetric monoidal category', 'finite-dimensional vector spaces', 'field of rational functions', 'differentiation', 'direct sum', 'tensor product'

- Text: For any field k we give a presentation of FinVectk in terms of the generators used in signal-flow diagrams
- Concepts: 'field', 'presentation', 'FinVectk', 'generators', 'signal-flow diagrams'

- Text: A broader class of signal-flow diagrams also includes `caps' and `cups' to model feedback
- Concepts: 'signal-flow diagrams', 'caps', 'cups', 'feedback'

- Text: We show these diagrams can be seen as string diagrams for the symmetric monoidal category FinRelk, where objects are still finite-dimensional vector spaces but the morphisms are linear relations
- Concepts: 'string diagrams', 'symmetric monoidal category', 'FinRelk', 'finite-dimensional vector spaces', 'linear relations'

- Text: We also give a presentation for FinRelk
- Concepts: 'presentation', 'FinRelk'

- Text: The relations say, among other things, that the 1-dimensional vector space k has two special commutative dagger-Frobenius structures, such that the multiplication and unit of either one and the comultiplication and counit of the other fit together to form a bimonoid
- Concepts: '1-dimensional vector space', 'commutative dagger-Frobenius structures', 'multiplication', 'unit', 'comultiplication', 'counit', 'bimonoid'

- Text: This sort of structure, but with tensor product replacing direct sum, is familiar from the `ZX-calculus' obeyed by a finite-dimensional Hilbert space with two mutually unbiased bases.
- Concepts: 'tensor product', 'ZX-calculus', 'finite-dimensional', 'Hilbert space', 'mutually unbiased bases'

- Text: In this paper we define a sequence of monads $T^{(\infty,n)} (n\in\mathbb{N})$ on the category $\infty-Gr$ of

∞-graphs

- Concepts: 'monads', 'sequence of monads', '∞-graphs'

- Text: We conjecture that algebras for $\T^{(\infty,0)}$, which are defined in a purely algebraic setting, are models of ∞-groupoids
- Concepts: algebras, $\T^{(\infty,0)}$, algebraic setting, models, ∞-groupoids

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- Text: More generally, we conjecture that $T^{(\infty,n)}$-algebras are models for (∞,n)-categories
- Concepts: "$T^{(\infty,n)}$-algebras", "$(infty,n)$-categories", "models"

- Text: We prove that our $(\infty,0)$-categories are bigroupoids when truncated at level 2.
- Concepts: $(\infty,0)$-categories, bigroupoids, truncated, level 2

- Text: Are all subcategories of locally finitely presentable categories that are closed under limits and λ-filtered colimits also locally presentable? For full subcategories the answer is affirmative
- Concepts: subcategory', 'locally finitely presentable categories', 'limits', 'filtered colimits', 'locally presentable', 'full subcategories'

- Text: Makkai and Pitts proved that in the case $\lambda = \aleph_0$ the answer is affirmative also for all iso-full subcategories, i

- Concepts: λ, $\aleph_0$, iso-full subcategories

- Text: e., those containing with every pair of objects all isomorphisms between them
- Concepts: 'objects', 'isomorphisms'

- Text: We discuss a possible generalization of this from $\aleph_0$ to an arbitrary λ.
- Concepts: '$\aleph_0$', 'arbitrary λ'

- Text: We define a model category structure on a slice category of simplicial spaces, called the "Segal group action" structure, whose fibrant-cofibrant objects may be viewed as representing spaces X with an action of a fixed Segal group (i.e
- Concepts: 'model category', 'slice category', 'simplicial spaces', 'Segal group action', 'fibrant-cofibrant objects', 'representing spaces', 'Segal group'

- Text: a group-like, reduced Segal space)
- Concepts: 'Segal space', 'group-like', 'reduced'

- Text: We show that this model structure is Quillen equivalent to the projective model structure on G-spaces, S^BG}, where G is a simplicial group corresponding to the Segal group
- Concepts: 'model structure', 'Quillen equivalent', 'projective model structure', 'G-spaces', 'simplicial group', 'Segal group'

- Text: One advantage of this model is that if we start with an ordinary group action $X\in S^BG$ and apply a weakly monoidal functor of spaces $L: S \to S$ (such as localization or completion) on each simplicial degree of its associated Segal group action, we get a new Segal group action of LG on LX which can then be rigidified via the above-mentioned Quillen equivalence.
- Concepts: 'model', 'ordinary group action', 'weakly monoidal functor', 'spaces', 'localization', 'completion', 'simplicial degree', 'associated Segal group action', 'Segal group action', 'rigidified', 'Quillen equivalence'

- Text: Given a small quantaloid Q with a set of objects Q_0, it is proved that complete skeletal Q-categories, completely distributive skeletal Q-categories, and Q-powersets of Q-typed sets are all monadic over athe slice category of Set over Q_0.
- Concepts: 'quantaloid', 'objects', 'skeletal categories', 'distributive categories', 'Q-powersets', 'monadic', 'slice category', 'Set'

- Text: We put a model structure on the category of categories internal to simplicial sets
- Concepts: 'model structure', 'category of categories', 'simplicial sets'

- Text: The weak equivalences in this model structure are preserved and reflected by the nerve functor to bisimplicial sets with the complete Segal space model structure
- Concepts: 'model structure', 'weak equivalences', 'nerve functor', 'bisimplicial sets', 'complete Segal space model structure'

- Text: This model structure is shown to be a model for the homotopy theory of infinity categories
- Concepts: 'model structure', 'homotopy theory', 'infinity categories'

- Text: We also study the homotopy theory of internal presheaves over an internal category.
- Concepts: 'homotopy theory', 'internal presheaves', 'internal category'

- Text: We study the accessibility properties of trivial cofibrations and weak equivalences in a combinatorial model category and prove an estimate for the accessibility rank of weak equivalences
- Concepts: 'accessibility properties', 'trivial cofibrations', 'weak equivalences', 'combinatorial model category', 'accessibility rank'

- Text: In particular, we show that the class of weak equivalences between simplicial sets is finitely accessible.
- Concepts: 'simplicial sets', 'weak equivalences', 'finitely accessible'

- Text: It is well known how to compute the number of orbits of a group action
- Concepts: 'compute', 'number of orbits', 'group action'

- Text: A related problem, apparently not in the literature, is to determine the number of elements in an orbit
- Concepts: 'number', 'elements', 'orbit'

- Text: The theory that addresses this question leads to orbital extensive categories and to combinatorial aspects of such categories.
- Concepts: 'orbital extensive categories', 'combinatorial aspects'

- Text: Monoidal differential categories provide the framework for categorical models of differential linear logic
- Concepts: 'monoidal differential categories', 'categorical models', 'differential linear logic'

- Text: The coKleisli category of any monoidal differential category is always a Cartesian differential category
- Concepts: 'monoidal differential category', 'coKleisli category', 'Cartesian differential category'

- Text: Cartesian differential categories, besides arising in this manner as coKleisli categories, occur in many different and quite independent ways
- Concepts: 'Cartesian differential categories', 'coKleisli categories'

- Text: Thus, it was not obvious how to pass from Cartesian differential categories back to monoidal differential categories. This paper provides natural conditions under which the linear maps of a Cartesian differential category form a monoidal differential category
- Concepts: Cartesian differential categories', 'monoidal differential categories', 'linear maps'

- Text: This is a question of some practical importance as much of the machinery of modern differential geometry is based on models which implicitly allow such a passage, and thus the results and tools of the area tend to freely assume access to this structure. The purpose of this paper is to make precise the connection between the two types of differential categories
- Concepts: 'differential geometry', 'models', 'passage', 'results', 'tools', 'area', 'structure', 'paper', 'connection', 'differential categories'

- Text: As a prelude to this, however, it is convenient to have available a general theory which relates the behaviour of "linear" maps in Cartesian categories to the structure of Seely categories
- Concepts: 'linear', 'maps', 'Cartesian categories', 'structure', 'Seely categories', 'general theory'

- Text: The latter were developed to provide the categorical semantics for (fragments of) linear logic which use a "storage" modality
- Concepts: 'categorical semantics', 'linear logic', 'storage modality'

- Text: The general theory of storage, which underlies the results mentioned above, is developed in the opening sections of the paper and is then applied to the case of differential categories.
- Concepts: 'storage', 'general theory', 'differential categories'

- Text: The theory developed by Gambino and Kock, of polynomials over a locally cartesian closed category E, is generalised for E just having pullbacks

- Concepts: 'locally cartesian closed category', 'polynomials', 'pullbacks'

- Text: The 2-categorical analogue of the theory of polynomials and polynomial functors is given, and its relationship with Street's theory of fibrations within 2-categories is explored
- Concepts: 2-categorical, theory of polynomials, polynomial functors, Street's theory, fibrations, 2-categories

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- Text: Johnstone's notion of "bagdomain data" is adapted to the present framework to make it easier to completely exhibit examples of polynomial monads.
- Concepts: 'bagdomain data', 'polynomial monads'

- Text: We show that there are infinitely many distinct closed classes of colimits (in the sense of the Galois connection induced by commutation of limits and colimits in Set) which are intermediate between the class of pseudo-filtered colimits and that of all (small) colimits
- Concepts: 'closed classes', 'colimits', 'Galois connection', 'commutation of limits and colimits', 'pseudo-filtered colimits', 'small colimits'

- Text: On the other hand, if the corresponding class of limits contains either pullbacks or equalizers, then the class of colimits is contained in that of pseudo-filtered colimits.

- Concepts: 'limits', 'pullbacks', 'equalizers', 'colimits', 'pseudo-filtered colimits'

- Text: A factorization system (E, M) on a category A gives rise to the covariant category-valued pseudofunctor P of A sending each object to its slice category over M
- Concepts: 'factorization system', 'category', 'covariant', 'category-valued', 'pseudofunctor', 'slice category'

- Text: This article characterizes the P so obtained as follows: their object images have terminal objects, and they admit bicategorically cartesian liftings, up to equivalence, of slice-category projections
- Concepts: 'object', 'terminal object', 'bicategorical', 'cartesian lifting', 'slice-category', 'projection'

- Text: It is clear that, and how, (E, M) can be recovered from such a P
- Concepts: none (no math concepts mentioned in this context)

- Text: The correspondence thus described is actually the second of three similar ones between certain (E, M) and certain P that the article presents
- Concepts: None of the words in this context denote Math concepts.

- Text: In the first one the characterization of the P has all ultimately bicategorical ingredients replaced with their categorical analogues

- Concepts: 'characterization', 'bicategorical', 'categorical'

- Text: A category A with such a P is precisely what the author has called a `slicing site'
- Concepts: 'category', 'slicing site'

- Text: In the article's terms the associated (E, M) are again factorization systems - but the concept conveyed extends the standard one by not obliging isomorphisms to belong to either factor class -, namely those that are `right semireplete' (isomorphisms do belong to M and `left semistrict' (morphisms in M are monic relative to E)
- Concepts: 'factorization systems', 'isomorphisms', 'right semireplete', 'left semistrict', 'monic'

- Text: The third correspondence subsumes the other two; here the (E, M) are all right-semireplete factorization systems.
- Concepts: 'correspondence', 'subsumes', 'factorization systems', 'right-semireplete'

- Text: This paper concerns the relationships between notions of weak n-category defined as algebras for n-globular operads, as well as their coherence properties
- Concepts: 'weak n-category', 'algebras', 'n-globular operads', 'coherence properties'

- Text: We focus primarily on the definitions due to Batanin and Leinster. A correspondence between the contractions and systems of compositions used in Batanin's definition, and the unbiased contractions used in Leinster's definition, has long been suspected, and we prove a conjecture of Leinster that shows that the two notions are in some sense equivalent
- Concepts: 'contractions', 'systems of compositions', 'Batanin's definition', 'unbiased contractions', "Leinster's definition", 'conjecture', 'equivalent'

- Text: We then prove several coherence theorems which apply to algebras for any operad with a contraction and system of compositions or with an unbiased contraction; these coherence theorems thus apply to weak n-categories in the senses of Batanin, Leinster, Penon and Trimble. We then take some steps towards a comparison between Batanin weak n-categories and Leinster weak n-categories
- Concepts: operad, contraction, system of compositions, unbiased contraction, coherence theorems, weak n-categories, Batanin, Leinster, Penon, Trimble

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- Text: We describe a canonical adjunction between the categories of these, giving a construction of the left adjoint, which is applicable in more generality to a class of functors induced by monad morphisms
- Concepts: 'adjunction', 'categories', 'left adjoint', 'construction', 'generality', 'class', 'functors', 'monad morphisms'

- Text: We conclude with some preliminary statements about a possible weak equivalence of some sort between these categories.
- Concepts: 'weak equivalence', 'categories'

- Text: We give several reformulations of action accessibility in the sense of D
- Concepts: 'action accessibility', 'reformulations'

- Text: Bourn and G
- Concepts: None - the given context does not contain any words that denote Math concepts.

- Text: Janelidze
- Concepts: None - the context only provides a name and does not mention any math concepts.

- Text: In particular we prove that a pointed exact protomodular category is action accessible if and only if for each normal monomorphism $\kappa:X\to A$ the normalizer of $<\kappa,\kappa>: X\to A\times A$ exists
- Concepts: 'protomodular category', 'pointed', 'exact', 'action accessible', 'normal monomorphism', 'normalizer'

- Text: This clarifies the connection between normalizers and action accessible categories established in a joint paper of D
- Concepts: 'normalizers', 'action accessible categories', 'joint paper'

- Text: Bourn and the author, in which it is proved that for pointed exact protomodular categories the existence of normalizers implies action accessibility
- Concepts: 'protomodular categories', 'normalizers', 'action accessibility'

- Text: In addition we prove a pointed exact protomodular category with coequalizers is action accessible if centralizers of normal monomorphisms exist, and the normality of unions holds.
- Concepts: 'protomodular category', 'exact category', 'coequalizer', 'centralizers', 'normal monomorphisms', 'unions'

- Text: It was argued by Crans that it is too much to ask that the category of Gray-categories admit a well behaved monoidal biclosed structure
- Concepts: 'Gray-categories', 'category', 'monoidal', 'biclosed structure'

- Text: We make this precise by establishing undesirable properties that any such monoidal biclosed structure must have
- Concepts: 'monoidal biclosed structure'

- Text: In particular we show that there does not exist any tensor product making the model category of Gray-categories into a monoidal model category.
- Concepts: tensor product', 'model category', 'Gray-categories', 'monoidal model category'

- Text: Generalized operads, also called generalized multicategories and T-monoids, are defined as monads within a Kleisli bicategory
- Concepts: 'generalized operads', 'generalized multicategories', 'monads', 'Kleisli bicategory'

- Text: With or without emphasizing their monoidal nature, generalized operads have been considered by numerous authors in different contexts, with examples including symmetric multicategories, topological spaces, globular operads and Lawvere theories
- Concepts: 'generalized operads', 'monoidal', 'symmetric multicategories', 'topological spaces', 'globular operads', 'Lawvere theories'

- Text: In this paper we study functoriality of the Kleisli construction, and correspondingly that of generalized operads
- Concepts: 'functoriality', 'Kleisli construction', 'generalized operads'

- Text: Motivated by this problem we develop a lax version of the formal theory of monads, and study its connection to bicategorical structures.
- Concepts: 'formal theory of monads', 'lax version', 'bicategorical structures'

- Text: We study and, in a number of cases, classify completely the limit closures in the category of commutative rings of subcategories of integral domains.

- Concepts: 'limit closures', 'category of commutative rings', 'integral domains'

- Text: The study of sup lattices teaches us the important distinction between the algebraic part of the structure (in this case suprema) and the coincidental part of the structure (in this case infima)
- Concepts: 'sup lattices', 'algebraic part', 'suprema', 'coincidental part', 'infima'

- Text: While a sup lattice happens to have all infima, only the suprema are part of the algebraic structure. Extending this idea, we look at posets that happen to have all suprema (and therefore all infima), but we will only declare some of them to be part of the algebraic structure (which we will call joins)
- Concepts: 'sup lattice', 'infima', 'suprema', 'algebraic structure', 'posets', 'joins'

- Text: We find that a lot of the theory of complete distributivity for sup lattices can be extended to this context
- Concepts: 'complete distributivity', 'sup lattices'

- Text: There are a lot of natural examples of completely join-distributive partial lattice complete partial orders, including for example, the lattice of all equivalence relations on a set X, and the lattice of all subgroups of a group G

- Concepts: 'partial lattice', 'complete partial order', 'join-distributive', 'lattice', 'equivalence relations', 'subgroups'

- Text: In both cases we define the join operation as union
- Concepts: 'join operation', 'union'

- Text: This is a partial operation, because for example, the union of subgroups of a group is not necessarily a subgroup
- Concepts: 'partial operation', 'union', 'subgroups', 'group'

- Text: However, sometimes it is, and keeping track of this can help with topics such as the inclusion-exclusion principle. Another motivation for the study of sup lattices is as a simplified model for the study of presheaf categories
- Concepts: 'sup lattices', 'inclusion-exclusion principle', 'presheaf categories'

- Text: The construction of downsets is a form of the Yoneda embedding, and the study of downset lattices can be a useful guide for the study of presheaf categories
- Concepts: 'construction', 'downsets', 'Yoneda embedding', 'study', 'downset lattices', 'presheaf categories'

- Text: In this context, partial lattices can be viewed as a simplified model for the study of sheaf categories.
- Concepts: 'partial lattices', 'simplified model', 'study', 'sheaf categories'

- Text: The homotopy theory of higher categorical structures has become a relevant part of the machinery of algebraic topology and algebraic K-theory, and this paper contains contributions to the study of the relationship between Benabou's bicategories and the homotopy types of their classifying spaces
- Concepts: 'homotopy theory', 'higher categorical structures', 'machinery of algebraic topology', 'algebraic K-theory', 'Benabou's bicategories', 'classifying spaces'

- Text: Mainly, we state and prove an extension of Quillen's Theorem B by showing, under reasonable necessary conditions, a bicategory-theoretical interpretation of the homotopy-fibre product of the continuous maps induced on classifying spaces by a diagram of bicategories $A\to B \leftarrow A'$
- Concepts: 'Quillen's Theorem B', 'homotopy-fibre product', 'continuous maps', 'classifying spaces', 'diagram of bicategories', 'bicategory-theoretical interpretation'

- Text: Applications are given for the study of homotopy pullbacks of monoidal categories and of crossed modules.
- Concepts: 'homotopy pullbacks', 'monoidal categories', 'crossed modules'

- Text: We extend to semi-abelian categories the notion of characteristic subobject, which is widely used in group theory and in the theory of Lie algebras
- Concepts: 'semi-abelian categories', 'characteristic subobject', 'group theory', 'theory of Lie algebras'

- Text: Moreover, we show that many of the classical properties of characteristic subgroups of a group hold in the general semi-abelian context, or in stronger ones.
- Concepts: 'characteristic subgroups', 'group', 'semi-abelian', 'properties'

- Text: We study Kan extensions in three weakenings of the Eilenberg-Moore double category associated to a double monad, that was introduced by Grandis and Paré
- Concepts: 'Kan extensions', 'weakenings', 'Eilenberg-Moore double category', 'double monad'

- Text: To be precise, given a normal oplax double monad T on a double category K, we consider the double categories consisting of pseudo T-algebras, `weak' vertical T-morphisms, horizontal T-morphisms and T-cells, where `weak' means either `lax', `colax' or `pseudo'
- Concepts: 'op-lax double monad', 'double category', 'pseudo T-algebras', 'vertical T-morphisms', 'horizontal T-morphisms', 'T-cells', 'lax', 'colax', 'pseudo'

- Text: Denoting these double categories by Alg_w(T), where w = l, c or ps accordingly, our main result gives, in each of these cases, conditions ensuring that (pointwise) Kan extensions can be lifted along the forgetful double functor Alg_w(T) --> K
- Concepts: double categories, Kan extensions, forgetful double functor

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- Text: As an application we recover and generalise a result by Getzler, on the lifting of pointwise left Kan extensions along symmetric monoidal enriched functors
- Concepts: 'left Kan extension', 'symmetric monoidal', 'enriched functor'

- Text: As an application of Getzler's result we prove, in suitable symmetric monoidal categories, the existence of bicommutative Hopf monoids that are freely generated by cocommutative comonoids.
- Concepts: 'symmetric monoidal categories', 'bicommutative Hopf monoids', 'cocommutative comonoids', 'freely generated'

- Text: We generalize Quillen's Theorem A to triangles of lax 2-functors which commute up to transformation
- Concepts: 'Quillen's Theorem A', 'lax 2-functors', 'triangles', 'commute', 'transformation'

- Text: It follows from a special case of this result that 2-categories are models for homotopy types.
- Concepts: 2-categories, homotopy types, models

- Text: We show that the homotopy colimit construction for diagrams of categories with an operad action, recently introduced by Fiedorowicz, Stelzer and Vogt, has the desired homotopy type for diagrams of weak braided monoidal categories
- Concepts: 'homotopy colimit', 'diagrams of categories', 'operad action', 'weak braided monoidal categories'

- Text: This provides a more flexible way to realize E_2 spaces categorically.
- Concepts: 'E_2 spaces', 'categorically'

- Text: In the present article we describe constructions of model structures on general bicomplete categories
- Concepts: 'model structures', 'bicomplete categories'

- Text: We are motivated by the following question: given a category C with a suitable subcategory wC, when is there a model structure on C with wC as the subcategory of weak equivalences? We begin exploring this question in the case where wC = F^{-1}(iso D) for some functor F : C --> D
- Concepts: 'category', 'subcategory', 'model structure', 'weak equivalences', 'functor'

- Text: We also prove properness of our constructions under minor assumptions and examine an application to the category of infinite graphs.
- Concepts: 'properness', 'category', 'infinite graphs'

- Text: A quasi-schemoid is a small category with a particular partition of the set of morphisms
- Concepts: 'quasi-schemoid', 'small category', 'partition', 'set of morphisms'

- Text: We define a homotopy relation on the category of quasi-schemoids and study its fundamental properties

- Concepts: 'homotopy relation', 'category', 'quasi-schemoids', 'fundamental properties'

- Text: The homotopy set of self-homotopy equivalences on a quasi-schemoid is used as a homotopy invariant in the study
- Concepts: 'homotopy', 'self-homotopy equivalence', 'quasi-schemoid', 'homotopy invariant'

- Text: The main theorem enables us to deduce that the homotopy invariant for the quasi-schemoid induced by a finite group is isomorphic to the automorphism group of the given group
- Concepts: homotopy invariant, quasi-schemoid, finite group, automorphism group

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- Text: %These considerations are the first step to develop homotopy theory for quasi-schemoids.
- Concepts: 'homotopy theory', 'quasi-schemoids'

- Text: It is proved that for any small Grothendieck site X, there exists a coreflection (called \emph{cosheafification}) from the category of precosheaves on X with values in a category K, to the full subcategory of cosheaves, provided either K or K^{op} is locally presentable
- Concepts: 'Grothendieck site', 'cosheafification', 'precosheaves', 'cosheaves', 'locally presentable'

- Text: If K is cocomplete, such a coreflection is built explicitly for the (pre)cosheaves with values in the category $Pro(K)$ of pro-objects in K

- Concepts: 'cocomplete', 'coreflection', '(pre)cosheaves', 'category', 'pro-objects'

- Text: In the case of precosheaves on topological spaces, it is proved that any precosheaf with values in $Pro(K)$ is smooth, i.e
- Concepts: 'precosheaves', 'topological spaces', '$Pro(K)$', 'smooth'

- Text: is strongly locally isomorphic to a cosheaf
- Concepts: 'locally isomorphic', 'cosheaf'

- Text: Constant cosheaves are constructed, and there are established connections with shape theory.
- Concepts: 'constant cosheaves', 'shape theory'

- Text: Unlike the uniform completion, the Dedekind completion of a vector lattice is not functorial
- Concepts: 'Dedekind completion', 'vector lattice', 'functorial'

- Text: In order to repair the lack of functoriality of Dedekind completions, we enrich the signature of vector lattices with a proximity relation, thus arriving at the category pdv of proximity Dedekind vector lattices
- Concepts: 'functoriality', 'Dedekind completions', 'vector lattices', 'proximity relation', 'category', 'proximity Dedekind vector lattices'

- Text: We prove that the Dedekind completion induces a functor from the category bav of bounded archimedean vector lattices to pdv, which in fact is an equivalence
- Concepts: 'Dedekind completion', 'functor', 'category', 'bounded archimedean vector lattice', 'equivalence'

- Text: We utilize the results of Dilworth to show that every proximity Dedekind vector lattice D is represented as the normal real-valued functions on the compact Hausdorff space associated with D
- Concepts: 'Dedekind vector lattice', 'normal real-valued functions', 'compact Hausdorff space'

- Text: This yields a contravariant adjunction between pdv and the category KHaus of compact Hausdorff spaces, which restricts to a dual equivalence between KHaus and the proper subcategory of pdv consisting of those proximity Dedekind vector lattices in which the proximity is uniformly closed
- Concepts: 'contravariant adjunction', 'pdv', 'category', 'KHaus', 'compact Hausdorff space', 'dual equivalence', 'proper subcategory', 'proximity Dedekind vector lattice', 'proximity', 'uniformly closed'

- Text: We show how to derive the classic Yosida Representation, Kakutani-Krein Duality, Stone-Gelfand-Naimark Duality, and Stone-Nakano Theorem from our approach.
- Concepts: 'Yosida Representation', 'Kakutani-Krein Duality', 'Stone-Gelfand-Naimark Duality', 'Stone-Nakano Theorem'

- Text: In this paper we continue, following the pioneering works by J
- Concepts: None. The context is incomplete and does not provide any information related to Math concepts.

- Text: Cartmell and T
- Concepts: There are no math concepts in this context.

- Text: Streicher, the study of the most important structures on C-systems, the structures that correspond, in the case of the syntactic C-systems, to the $(\Pi,\lambda,app,\beta,\eta)$-system of inference rules. One such structure was introduced by J
- Concepts: 'C-systems', 'syntactic C-systems', '$(\Pi, \lambda, app, \beta, \eta)$-system of inference rules'

- Text: Cartmell and later studied by T
- Concepts: None present in the given context

- Text: Streicher under the name of the products of families of types. We introduce the notion of a (Π,λ)-structure and construct a bijection, for a given C-system, between the set of (Π,λ)-structures and the set of Cartmell-Streicher structures
- Concepts: (Π,λ)-structure, C-system, Cartmell-Streicher structures

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- Text: In the following paper we will show how to construct, and in some cases fully classify, the (Π,λ)-structures on the

C-systems that correspond to universe categories. The first section of the paper provides careful proofs of many of the properties of general C-systems

- Concepts: (Π,λ)-structures, C-systems, universe categories, proofs, properties

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- Text: Methods of the paper are fully constructive, that is, neither the axiom of excluded middle nor the axiom of choice are used.
- Concepts: constructive methods, axiom of excluded middle, axiom of choice

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- Text: The theory of monads on categories equipped with a dagger (a contravariant identity-on-objects involutive endofunctor) works best when all structure respects the dagger: the monad and adjunctions should preserve the dagger, and the monad and its algebras should satisfy the so-called Frobenius law
- Concepts: monads, categories, dagger, contravariant, endofunctor, adjunctions, algebras, Frobenius law

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- Text: Then any monad resolves as an adjunction, with extremal solutions given by the categories of Kleisli and Frobenius-Eilenberg-Moore algebras, which again have a dagger
- Concepts: 'monad', 'adjunction', 'Kleisli category', 'Frobenius-Eilenberg-Moore algebra', 'dagger'

- Text: We characterize the Frobenius law as a coherence property between dagger and closure, and characterize strong such monads as being induced by Frobenius monoids.

- Concepts: 'Frobenius law', 'coherence property', 'dagger', 'closure', 'monads', 'Frobenius monoids'

- Text: We provide a more economical refined version of Evrard's categorical cocylinder factorization of a functor
- Concepts: 'categorical', 'cocylinder factorization', 'functor'

- Text: We show that any functor between small categories can be factored into a homotopy equivalence followed by a (co)fibred functor which satisfies the (dual) assumption of Quillen's Theorem B.
- Concepts: functor, small categories, homotopy equivalence, (co)fibred functor, Quillen's Theorem B

- Text: Sheaves are objects of a local nature: a global section is determined by how it looks locally
- Concepts: 'sheaves', 'local nature', 'global section'

- Text: Hence, a sheaf cannot describe mathematical structures which contain global or nonlocal geometric information
- Concepts: 'sheaf', 'mathematical structures', 'global information', 'nonlocal geometric information'

- Text: To fill this gap, we introduce the theory of ``gleaves'', which are presheaves equipped with an additional ``gluing operation'' of compatible pairs of local sections
- Concepts: 'presheaves', 'gluing operation', 'compatible pairs', 'local sections'

- Text: This generalizes the conditional product structures of Dawid and Studeny, which correspond to gleaves on distributive lattices
- Concepts: 'conditional product structures', 'Dawid', 'Studeny', 'gleaves', 'distributive lattices'

- Text: Our examples include the gleaf of metric spaces and the gleaf of joint probability distributions
- Concepts: 'metric spaces', 'joint probability distributions', 'gleaf'

- Text: A result of Johnstone shows that a category of gleaves can have a subobject classifier despite not being cartesian closed. Gleaves over the simplex category Δ, which we call compositories, can be interpreted as a new kind of higher category in which the composition of an m-morphism and an n-morphism along a common k-morphism face results in an (m+n-k)-morphism
- Concepts: category, subobject classifier, cartesian closed, gleaves, simplex category, higher category, morphism

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- Text: The distinctive feature of this composition operation is that the original morphisms can be recovered from the composite morphism as initial and final faces
- Concepts: 'composition operation', 'morphisms', 'composite morphism', 'initial face', 'final face'

- Text: Examples of compositories include nerves of categories and compositories of higher spans.

- Concepts: compositories, nerves of categories, higher spans

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- Text: We study the theory of representations of a 2-group G in Baez-Crans 2-vector spaces over a field k of arbitrary characteristic, and the corresponding 2-vector spaces of intertwiners
- Concepts: '2-group', 'representations', '2-vector spaces', 'intertwiners'

- Text: We also characterize the irreducible and indecomposable representations
- Concepts: 'irreducible', 'indecomposable', 'representations'

- Text: Finally, it is shown that when the 2-group is finite and the base field k is of characteristic zero or coprime to the orders of the homotopy groups of G, the theory essentially reduces to the theory of k-linear representations of the first homotopy group of G, the remaining homotopy invariants of G playing no role.
- Concepts: '2-group', 'finite', 'base field', 'characteristic zero', 'coprime', 'homotopy groups', 'k-linear representations', 'first homotopy group', 'homotopy invariants'

- Text: We consider locales B as algebras in the tensor category sl of sup-lattices
- Concepts: 'locales', 'algebras', 'tensor category', 'sup-lattices'

- Text: We show the equivalence between the Joyal-Tierney descent theorem for open localic surjections q : shB --> E in

Galois theory and a Tannakian recognition theorem over sl for the sl-functor Rel (q^*) : Rel(E) --> Rel(shB) \cong (B-Mod)_0 into the sl-category of discrete B-modules

- Concepts: Galois theory, Joyal-Tierney descent theorem, open localic surjections, Tannakian recognition theorem, sl-functor, Rel(q*), sl-category, discrete B-modules

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- Text: Thus, a new Tannaka recognition theorem is obtained, essentially different from those known so far
- Concepts: 'Tannaka recognition theorem'

- Text: This equivalence follows from two independent results
- Concepts: 'equivalence', 'independent results'

- Text: We develop an explicit construction of the localic groupoid G associated by Joyal-Tierney to q, and do an exhaustive comparison with the Deligne Tannakian construction of the Hopf algebroid L associated to Rel(q^*), and show they are isomorphic, that is, L \cong O(G)
- Concepts: 'localic groupoid', 'Joyal-Tierney', 'Hopf algebroid', 'Deligne Tannakian construction', 'isomorphic'

- Text: On the other hand, we show that the sl-category of relations of the classifying topos of any localic groupoid G, is equivalent to the sl-category of L-comodules with discrete subjacent B-module, where L = O(G).} We are forced to work over an arbitrary base topos because, contrary to the neutral case which can be developed completely over Sets, here change of base techniques are unavoidable.

- Concepts: 'sl-category', 'classifying topos', 'localic groupoid', 'L-comodules', 'B-module', 'base topos', 'change of base'

- Text: Projectivity, continuity and adjointness: quantales, Q-posets and Q-modules In this paper, projective modules over a quantale are characterized by distributivity, continuity, and adjointness conditions
- Concepts: 'projectivity', 'continuity', 'adjointness', 'quantales', 'Q-posets', 'Q-modules'

- Text: It is then shown that a morphism Q --> A of commutative quantales is coexponentiable if and only if the corresponding Q-module is projective, and hence, satisfies these equivalent conditions.
- Concepts: 'commutative quantales', 'coexponentiable', 'Q-module', 'projective', 'equivalent conditions'

- Text: We present a version of the enriched Yoneda lemma for conventional (not ∞-) categories
- Concepts: 'enriched Yoneda lemma', 'conventional categories'

- Text: We do not require the base monoidal category M to be closed or symmetric monoidal
- Concepts: 'monoidal category', 'closed monoidal category', 'symmetric monoidal'

- Text: In the case M has colimits and the monoidal structure in M preserves colimits in each argument, we prove that the Yoneda embedding A to P_M(A) is a universal functor from A to a category with colimits, left-tensored over M.
- Concepts: colimits, monoidal structure, Yoneda embedding, category with colimits, left-tensored

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- Text: In this paper, we use some basic quasi-topos theory to study two functors: one adding infinitesimals of Fermat reals to diffeological spaces (which generalize smooth manifolds including singular spaces and infinite-dimensional spaces), and the other deleting infinitesimals on Fermat spaces
- Concepts: 'quasi-topos theory', 'functors', 'infinitesimals', 'Fermat reals', 'diffeological spaces', 'smooth manifolds', 'singular spaces', 'infinite-dimensional spaces', 'deleting infinitesimals'

- Text: We study the properties of these functors, and calculate some examples
- Concepts: 'functors', 'calculate', 'examples'

- Text: These serve as fundamentals for developing differential geometry on diffeological spaces using infinitesimals in a future paper.
- Concepts: 'differential geometry', 'diffeological spaces', 'infinitesimals'

- Text: We give a direct proof that the category of strict ω-categories is monadic over the category of polygraphs.

- Concepts: 'ω-categories', 'monadic', 'category', 'polygraphs'

- Text: A compact closed bicategory is a symmetric monoidal bicategory where every object is equipped with a weak dual
- Concepts: 'compact closed bicategory', 'symmetric monoidal bicategory', 'object', 'weak dual'

- Text: The unit and counit satisfy the usual ``zig-zag'' identities of a compact closed category only up to natural isomorphism, and the isomorphism is subject to a coherence law
- Concepts: 'unit', 'counit', 'compact closed category', 'coherence law', 'natural isomorphism'

- Text: We give several examples of compact closed bicategories, then review previous work
- Concepts: 'compact closed bicategories'

- Text: In particular, Day and Street defined compact closed bicategories indirectly via Gray monoids and then appealed to a coherence theorem to extend the concept to bicategories; we restate the definition directly. We prove that given a 2-category T with finite products and weak pullbacks, the bicategory of objects of C, spans, and isomorphism classes of maps of spans is compact closed
- Concepts: 'compact closed bicategories', 'bicategories', 'Gray monoids', 'coherence theorem', '2-category', 'finite products', 'weak pullbacks', 'spans', 'isomorphism classes', 'maps of spans'

- Text: As corollaries, the bicategory of spans of sets and certain bicategories of ``resistor networks'' are compact closed.
- Concepts: bicategory, spans, sets, resistor networks, compact closed

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- Text: We develop a homotopy theory of categories enriched in a monoidal model category V
- Concepts: 'homotopy theory', 'categories enriched', 'monoidal model category'

- Text: In particular, we deal with homotopy weighted limits and colimits, and homotopy local presentability
- Concepts: 'homotopy', 'weighted limits', 'colimits', 'local presentability'

- Text: The main result, which was known for simplicially-enriched categories, links homotopy locally presentable V-categories with combinatorial model V-categories, in the case where all objects of V are cofibrant.
- Concepts: 'homotopy', 'locally presentable', 'V-categories', 'cofibrant', 'combinatorial model'

- Text: The Joyal model structure on simplicial sets is extended to a model structure on the simplicial presheaves on a small site, in which the cofibrations are monomorphisms and the weak equivalences are local (or stalkwise) Joyal equivalences
- Concepts: Joyal model structure, simplicial sets, model structure, simplicial presheaves, small site, cofibrations, monomorphisms,

weak equivalences, local Joyal equivalences

- Text: The model structure is shown to be left proper.
- Concepts: model structure', 'left proper'

- Text: We show that in any symmetric monoidal category, if a weight for colimits is absolute, then the resulting colimit of any diagram of dualizable objects is again dualizable
- Concepts: 'symmetric monoidal category', 'weight for colimits', 'absolute', 'colimit', 'diagram', 'dualizable objects'

- Text: Moreover, in this case, if an endomorphism of the colimit is induced by an endomorphism of the diagram, then its trace can be calculated as a linear combination of traces on the objects in the diagram
- Concepts: endomorphism, colimit, diagram, trace, linear combination

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- Text: The formal nature of this result makes it easy to generalize to traces in homotopical contexts (using derivators) and traces in bicategories
- Concepts: result', 'generalize', 'traces', 'homotopical contexts', 'derivators', 'bicategories'

- Text: These generalizations include the familiar additivity of the Euler characteristic and Lefschetz number along cofiber sequences, as well as an analogous result for the Reidemeister trace, but also the orbit-counting theorem for sets with a group

action, and a general formula for homotopy colimits over EI-categories.
- Concepts: Euler characteristic, Lefschetz number, cofiber sequences, Reidemeister trace, orbit-counting theorem, group action, homotopy colimits, EI-categories

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- Text: We show that every abstract Krivine structure in the sense of Streicher can be obtained, up to equivalence of the resulting tripos, from a filtered opca (A,A') and a subobject of 1 in the relative realizability topos RT(A',A); the topos is always a Boolean subtopos of RT(A',A)
- Concepts: 'abstract Krivine structure', 'filtered opca', 'subobject', 'relative realizability topos', 'Boolean subtopos'

- Text: We exhibit a range of non-localic Boolean subtriposes of the Kleene-Vesley tripos.
- Concepts: 'Boolean', 'subtriposes', 'Kleene-Vesley tripos'

- Text: We study the gerbal representations of a finite group G or, equivalently, module categories over Ostrik's category Vec_G^α for a 3-cocycle α
- Concepts: 'finite group', 'gerbal representations', 'module categories', 'Ostrik's category', '3-cocycle'

- Text: We adapt Bartlett's string diagram formalism to this situation to prove that the categorical character of a gerbal representation is a representation of the inertia groupoid of a categorical group

- Concepts: 'string diagram formalism', 'categorical character', 'gerbal representation', 'representation', 'inertia groupoid', 'categorical group'

- Text: We interpret such a representation as a module over the twisted Drinfeld double $D^\alpha(G)$.
- Concepts: 'twisted Drinfeld double', 'module', 'representation'

- Text: We define a notion of morphism for quotient vector bundles that yields both a category $QVBun$ and a contravariant global sections functor $C:QVBun^{op} \to Vect$ whose restriction to trivial vector bundles with fiber F coincides with the contravariant functor $Top^{op} \to Vect$ of F-valued continuous functions
- Concepts: 'morphism', 'quotient vector bundles', 'category', 'contravariant', 'global sections functor', 'trivial vector bundles', 'fiber', 'contravariant functor', 'continuous functions'

- Text: Based on this we obtain a linear extension of the adjunction between the categories of topological spaces and locales: (i) a linearized topological space is a spectral vector bundle, by which is meant a mildly restricted type of quotient vector bundle; (ii) a linearized locale is a locale Δ equipped with both a topological vector space A and a Δ-valued support map for the elements of A satisfying a continuity condition relative to the spectrum of Δ and the lower Vietoris topology on $Sub A$; (iii) we obtain an adjunction between the full subcategory of spectral vector bundles $QVBun_\Sigma$ and the category of linearized locales $LinLoc$, which restricts to an equivalence of categories between sober spectral vector bundles and spatial linearized locales

- Concepts: 'linear extension', 'adjunction', 'topological spaces', 'locales', 'spectral vector bundle', 'quotient vector bundle', 'linearized locale', 'support map', 'continuity condition', 'spectrum', 'Vietoris topology', 'sub A', 'adjunction', 'subcategory', 'sober', 'spatial'

- Text: The spectral vector bundles are classified by a finer topology on $Sub A$, called the open support topology, but there is no notion of universal spectral vector bundle for an arbitrary topological vector space A.
- Concepts: 'spectral vector bundles', 'finer topology', 'open support topology', 'topological vector space'

- Text: The classical snake lemma produces a six terms exact sequence starting from a commutative square with one of the edge being a regular epimorphism
- Concepts: 'snake lemma', 'exact sequence', 'commutative square', 'regular epimorphism'

- Text: We establish a new diagram lemma, that we call snail lemma, removing such a condition
- Concepts: 'diagram lemma', 'snail lemma', 'condition'

- Text: We also show that the snail lemma subsumes the snake lemma and we give an interpretation of the snail lemma in terms of strong homotopy kernels

- Concepts: 'snail lemma', 'snake lemma', 'interpretation', 'homotopy kernels', 'strong homotopy kernels'

- Text: Our results hold in any pointed regular protomodular category.
- Concepts: 'pointed', 'regular', 'protomodular', 'category'

- Text: We show that the morphism axiom for n-angulated categories is redundant.
- Concepts: 'morphism axiom', 'n-angulated categories'

- Text: Model categories have long been a useful tool in homotopy theory, allowing many generalizations of results in topological spaces to other categories
- Concepts: 'model categories', 'homotopy theory', 'generalizations', 'topological spaces', 'categories'

- Text: Giving a localization of a model category provides an additional model category structure on the same base category, which alters what objects are being considered equivalent by increasing the class of weak equivalences
- Concepts: localization, model category, base category, weak equivalences

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- Text: In some situations, a model category where the class of weak equivalences is restricted from the original one could be more desirable

- Concepts: 'model category', 'weak equivalences', 'restricted class'

- Text: In this situation we need the notion of a delocalization
- Concepts: notion, delocalization

- Text: In this paper, right Bousfield delocalization is defined, we provide examples of right Bousfield delocalization as well as an existence theorem
- Concepts: 'paper', 'right Bousfield delocalization', 'examples', 'existence theorem'

- Text: In particular, we show that given two model category structures $\MO$ and $\MT$ we can define an additional model category structure $\MO \cap \MT$ by defining the class of weak equivalences to be the intersection of the $\MO$ and $\MT$ weak equivalences
- Concepts: 'model category structure', 'weak equivalence', 'intersection'

- Text: In addition we consider the model category on diagram categories over a base category (which is endowed with a model category structure) and show that delocalization is often preserved by the diagram model category structure.
- Concepts: 'model category', 'diagram categories', 'base category', 'model category structure', 'delocalization'

- Text: For a relative exact homological category (C,E), we define relative points over an arbitrary object in C, and show that they form an exact homological category
- Concepts: 'relative exact homological category', 'exact homological category', 'relative points'

- Text: In particular, it follows that the full subcategory of nilpotent objects in an exact homological category is an exact homological category
- Concepts: 'nilpotent objects', 'exact homological category'

- Text: These nilpotent objects are defined with respect to a Birkhoff subcategory in C as defined by T
- Concepts: 'nilpotent objects', 'Birkhoff subcategory'

- Text: Everaert and T
- Concepts: No concepts can be extracted as there is no additional information or context given in the prompt.

- Text: Van der Linden
- Concepts: None - the given context does not mention any Math concepts.

- Text: In addition, we introduce relative internal actions and show that, just as in the classical case, there is an equivalence of categories between the category of relative points over an object and the category of relative internal actions for the same object.

- Concepts: 'relative internal actions', 'equivalence of categories', 'relative points', 'object'

- Text: We introduced in a previous article a notion of Mal'tsevness relative to a specific class Σ of split epimorphisms
- Concepts: 'Mal\'tsevness', 'class', 'split epimorphisms'

- Text: We investigate here the induced relative notion of natural Mal'tsevness, with a special attention to the example of quandles.
- Concepts: 'induced relative notion', 'natural Mal\'tsevness', 'quandles'

- Text: A categorical principal bundle is a structure comprised of categories that is analogous to a classical principal bundle; examples arise from geometric contexts involving bundles over path spaces
- Concepts: 'categorical principal bundle', 'categories', 'classical principal bundle', 'geometric contexts', 'bundles', 'path spaces'

- Text: We show how a categorical principal bundle can be constructed from local data specified through transition functors and natural transformations.
- Concepts: 'categorical principal bundle', 'local data', 'transition functors', 'natural transformations'

- Text: We present a brief and simple cotriple description of the simplicial algebra used in Bloch's construction of the higher Chow groups.

- Concepts: 'cotriple', 'simplicial algebra', 'Bloch's construction', 'higher Chow groups'

- Text: By Isbell duality, each compact regular frame L is isomorphic to the frame of opens of a compact Hausdorff space X
- Concepts: 'Isbell duality', 'compact regular frame', 'frame of opens', 'compact Hausdorff space'

- Text: In this note we study the spectrum Spec(L) of prime filters of a compact regular frame L
- Concepts: 'spectrum', 'prime filters', 'compact regular frame'

- Text: We prove that X is realized as the minimum of Spec(L) and the Gleason cover of X as the maximum of Spec(L)
- Concepts: 'minimum', 'maximum', 'Spec(L)', 'Gleason cover'

- Text: We also characterize zero-dimensional, extremally disconnected, and scattered compact regular frames by means of Spec(L).
- Concepts: 'zero-dimensional', 'extremally disconnected', 'scattered', 'compact', 'regular frames', 'Spec(L)'

- Text: We revisit what we call the fibred topology on a fibred category over a site and we prove a few basic results concerning this topology
- Concepts: 'fibred topology', 'fibred category', 'site', 'basic results'

- Text: We give a general result concerning the invariance of a 2-category of stacks under change of base.
- Concepts: '2-category', 'stacks', 'invariance', 'change of base'

- Text: In this paper we investigate the construction of bicategories of fractions originally described by D.~Pronk: given any bicategory C together with a suitable class of morphisms W, one can construct a bicategory $C[W^{-1}]$, where all the morphisms of W are turned into internal equivalences, and that is universal with respect to this property
- Concepts: 'construction', 'bicategories of fractions', 'bicategory', 'morphisms', 'internal equivalences', 'universal property'

- Text: Most of the descriptions leading to this construction were long and heavily based on the axiom of choice
- Concepts: 'construction', 'axiom of choice'

- Text: In this paper we considerably simplify the description of the equivalence relation on 2-morphisms and the constructions of associators, vertical and horizontal compositions in $C[W^{-1}]$, thus proving that the axiom of choice is not needed under certain conditions
- Concepts: equivalence relation', '2-morphisms', 'associators', 'vertical composition', 'horizontal composition', 'axiom of choice'

- Text: The simplified description of associators and compositions will also play a crucial role in two forthcoming papers about pseudofunctors and equivalences between bicategories of fractions.

- Concepts: associators, compositions, pseudofunctors, equivalences, bicategories, fractions

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- Text: We prove a biadjoint triangle theorem and its strict version, which are 2-dimensional analogues of the adjoint triangle theorem of Dubuc
- Concepts: 'biadjoint triangle theorem', 'strict version', '2-dimensional', 'analogues', 'adjoint triangle theorem'

- Text: Similarly to the 1-dimensional case, we demonstrate how we can apply our results to get the pseudomonadicity characterization (due to Le Creurer, Marmolejo and Vitale). Furthermore, we study applications of our main theorems in the context of the 2-monadic approach to coherence
- Concepts: 'pseudomonadicity characterization', '2-monadic approach', 'coherence'

- Text: As a direct consequence of our strict biadjoint triangle theorem, we give the construction (due to Lack) of the left 2-adjoint to the inclusion of the strict algebras into the pseudoalgebras. In the last section, we give two brief applications on lifting biadjunctions and pseudo-Kan extensions.
- Concepts: 'strict biadjoint triangle theorem', 'construction', 'Lack', 'left 2-adjoint', 'inclusion', 'strict algebras', 'pseudoalgebras', 'lifting biadjunctions', 'pseudo-Kan extensions'

- Text: The category of symmetric quandles is a Mal'tsev variety whose subvariety of abelian symmetric quandles is the category of abelian algebras
- Concepts: 'symmetric quandles', 'Mal\'tsev variety', 'abelian symmetric quandles', 'category of abelian algebras'

- Text: We give an algebraic description of the quandle extensions that are central for the adjunction between the variety of quandles and its subvariety of abelian symmetric quandles.
- Concepts: 'algebraic description', 'quandle extensions', 'adjunction', 'variety of quandles', 'subvariety', 'abelian symmetric quandles'

- Text: For a coherent site we construct a canonically associated enlarged coherent site, such that cohomology of bounded below complexes is preserved by the enlargement
- Concepts: 'coherent site', 'enlarged coherent site', 'cohomology', 'bounded below complexes'

- Text: In the topos associated to the enlarged site transfinite compositions of epimorphisms are epimorphisms and a weak analog of the concept of the algebraic closure exists
- Concepts: 'topos', 'enlarged site', 'transfinite compositions', 'epimorphisms', 'weak analog', 'algebraic closure'

- Text: The construction is a variant of the work of Bhatt and Scholze on the pro-etale topology.

- Concepts: 'construction', 'variant', 'work', 'Bhatt', 'Scholze', 'pro-etale topology'

- Text: There is a general notion of the magnitude of an enriched category, defined subject to hypotheses
- Concepts: 'enriched category', 'magnitude'

- Text: In topological and geometric contexts, magnitude is already known to be closely related to classical invariants such as Euler characteristic and dimension
- Concepts: 'magnitude', 'topological', 'geometric', 'invariants', 'Euler characteristic', 'dimension'

- Text: Here we establish its significance in an algebraic context
- Concepts: 'algebraic context'

- Text: Specifically, in the representation theory of an associative algebra A, a central role is played by the indecomposable projective A-modules, which form a category enriched in vector spaces
- Concepts: 'representation theory', 'associative algebra', 'indecomposable projective module', 'enriched category', 'vector spaces'

- Text: We show that the magnitude of that category is a known homological invariant of the algebra: writing χ_A for the Euler form of A and S for the direct sum of the simple A-modules, it is $\chi_A(S,S)$.

- Concepts: 'category', 'homological invariant', 'Euler form', 'direct sum', 'simple A-modules'

- Text: Symmetric monoidal closed categories may be related to one another not only by the functors between them but also by enrichment of one in another, and it was known to G
- Concepts: 'symmetric monoidal closed categories', 'functors', 'enrichment'

- Text: M
- Concepts: There are no Math concepts mentioned in the given context "M".

- Text: Kelly in the 1960s that there is a very close connection between these phenomena
- Concepts: None found as the given context does not mention any specific math concepts or terms.

- Text: In this first part of a two-part series on this subject, we show that the assignment to each symmetric monoidal closed category V its associated V-enriched category $underline{V}$ extends to a 2-functor valued in an op-2-fibred 2-category of symmetric monoidal closed categories enriched over various bases
- Concepts: 'symmetric monoidal closed category', 'V-enriched category', '2-functor', 'op-2-fibred 2-category', 'enriched over various bases'

- Text: For a fixed V, we show that this induces a 2-functorial passage from symmetric monoidal closed categories over V (i.e., equipped with a morphism to V) to symmetric monoidal closed V-categories over $underline{V}$
- Concepts: 'fixed', 'symmetric monoidal closed categories', 'morphisms', '2-functorial passage', 'symmetric monoidal closed V-categories', '$underline{V}$'

- Text: As a consequence, we find that the enriched adjunction determined a symmetric monoidal closed adjunction can be obtained by applying a 2-functor and, consequently, is an adjunction in the 2-category of symmetric monoidal closed V-categories.
- Concepts: 'enriched adjunction', 'symmetric monoidal closed adjunction', '2-functor', '2-category', 'symmetric monoidal closed V-categories'

- Text: Under a minimum of assumptions, we develop in generality the basic theory of universal algebra in a symmetric monoidal closed category V with respect to a specified system of arities $j:J \hookrightarrow V$
- Concepts: 'universal algebra', 'symmetric monoidal closed category', 'system of arities'

- Text: Lawvere's notion of algebraic theory generalizes to this context, resulting in the notion of single-sorted V-enriched J-cotensor theory, or J-theory for short

- Concepts: algebraic theory', 'single-sorted', 'V-enriched', 'J-cotensor theory', 'J-theory'

- Text: For suitable choices of V and J, such J-theories include the enriched algebraic theories of Borceux and Day, the enriched Lawvere theories of Power, the equational theories of Linton's 1965 work, and the V-theories of Dubuc, which are recovered by taking $J = V$ and correspond to arbitrary V-monads on V
- Concepts: 'enriched algebraic theories', 'enriched Lawvere theories', 'equational theories', 'V-theories', 'V-monads'

- Text: We identify a modest condition on j that entails that the V-category of T-algebras exists and is monadic over V for every J-theory T, even when T is not small and V is neither complete nor cocomplete
- Concepts: V-category, T-algebras, monadic, J-theory, small, complete, cocomplete

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- Text: We show that j satisfies this condition if and only if j presents V as a free cocompletion of J with respect to the weights for left Kan extensions along j, and so we call such systems of arities eleutheric
- Concepts: 'free cocompletion', 'left Kan extensions', 'systems of arities', 'eleutheric'

- Text: We show that J-theories for an eleutheric system may be equivalently described as (i) monads in a certain one-object bicategory of profunctors on J, and (ii) V-monads on V satisfying a certain condition

- Concepts: 'J-theories', 'eleutheric system', 'monads', 'bicategory', 'profunctors', 'V-monads'

- Text: We prove a characterization theorem for the categories of algebras of J-theories, considered as V-categories A equipped with a specified V-functor $A \rightarrow V$.
- Concepts: J-theories, algebras, categories, V-categories, V-functor

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- Text: Birkhoff's variety theorem from universal algebra characterises equational subcategories of varieties
- Concepts: Birkhoff's variety theorem', 'universal algebra', 'equational subcategories', 'varieties'

- Text: We give an analogue of Birkhoff's theorem in the setting of enrichment in categories
- Concepts: 'Birkhoff's theorem', 'enrichment', 'categories'

- Text: For a suitable notion of an equational subcategory we characterise these subcategories by their closure properties in the ambient algebraic category.
- Concepts: 'equational subcategory', 'closure properties', 'ambient algebraic category'

- Text: We show that every small model category that satisfies certain size conditions can be completed to yield a combinatorial model category, and conversely, every combinatorial model category arises in this way

- Concepts: 'small model category', 'size conditions', 'combinatorial model category'

- Text: We will also see that these constructions preserve right properness and compatibility with simplicial enrichment
- Concepts: 'constructions', 'right properness', 'simplicial enrichment', 'compatibility'

- Text: Along the way, we establish some technical results on the index of accessibility of various constructions on accessible categories, which may be of independent interest.
- Concepts: 'index of accessibility', 'accessible categories', 'various constructions'

- Text: We develop the homotopy theory of Euler characteristic (magnitude) of a category enriched in a monoidal model category
- Concepts: 'homotopy theory', 'Euler characteristic', 'category enriched', 'monoidal model category'

- Text: If a monoidal model category V is equipped with an Euler characteristic that is compatible with weak equivalences and fibrations in V, then our Euler characteristic of V-enriched categories is also compatible with weak equivalences and fibrations in the canonical model structure on the category of V-enriched categories

- Concepts: 'monoidal model category', 'Euler characteristic', 'weak equivalences', 'fibrations', 'V-enriched categories', 'canonical model structure'

- Text: In particular, we focus on the case of topological categories; i.e., categories enriched in the category of topological spaces
- Concepts: 'topological categories', 'categories enriched', 'category of topological spaces'

- Text: As its application, we obtain the ordinary Euler characteristic of a cellular stratified space X by computing the Euler characteristic of the face category $C(X)$.
- Concepts: 'cellular stratified space', 'Euler characteristic', 'face category'

- Text: We study a categorical commutator, introduced by Huq, defined for a pair of coterminal morphisms
- Concepts: 'categorical commutator', 'coterminal morphisms'

- Text: We show that in a normal unital category C with finite colimits, the normal closure of the regular image of the Huq commutator of a pair of subobjects under an arbitrary morphism is the same as the Huq commutator of their respective regular images
- Concepts: 'normal unital category', 'finite colimits', 'normal closure', 'regular image', 'Huq commutator', 'subobjects', 'arbitrary morphism'

- Text: Then we use this property to characterize the Huq commutator as the largest commutator satisfying certain properties.
- Concepts: 'Huq commutator', 'largest commutator', 'certain properties'

- Text: The purpose of this paper is two-fold
- Concepts: None given - the context does not contain any math concepts to extract.

- Text: A first and more concrete aim is to characterise n-permutable categories through certain stability properties of regular epimorphisms
- Concepts: 'n-permutable categories', 'regular epimorphisms', 'stability properties'

- Text: These characterisations allow us to recover the ternary terms and the (n+1)-ary terms describing n-permutable varieties of universal algebras. A second and more abstract aim is to explain two proof techniques, by using the above characterisation as an opportunity to provide explicit new examples of their use: - an embedding theorem for n-permutable categories which allows us to follow the varietal proof to show that an n-permutable category has certain properties; - the theory of unconditional exactness properties which allows us to remove the assumption of the existence of colimits, in particular when we use the approximate co-operations approach to show that a regular category is n-permutable.

- Concepts: 'ternary terms', '(n+1)-ary terms', 'n-permutable varieties', 'universal algebras', 'embedding theorem', 'n-permutable categories', 'varietal proof', 'unconditional exactness properties', 'colimits', 'regular category', 'approximate co-operations'

- Text: In this paper we introduce a notion of Mal'tsev object, and the dual notion of co-Mal'tsev object, in a general category
- Concepts: 'Mal\'tsev object', 'co-Mal\'tsev object', 'general category'

- Text: In particular, a category C is a Mal'tsev category if and only if every object in C is a Mal'tsev object
- Concepts: 'category', 'Mal\'tsev category', 'object', 'Mal\'tsev object'

- Text: We show that for a well-powered regular category C which admits coproducts, the full subcategory of Mal'tsev objects is coreflective in C
- Concepts: 'well-powered', 'regular category', 'coproducts', 'Mal\'tsev objects', 'coreflective'

- Text: We show that the co-Mal'tsev objects in the category of topological spaces and continuous maps are precisely the R_1-spaces, and that the co-Mal'tsev objects in the category of metric spaces and short maps are precisely the ultrametric spaces.

- Concepts: 'co-Mal'tsev objects', 'topological spaces', 'continuous maps', 'R_1-spaces', 'metric spaces', 'short maps', 'ultrametric spaces'

- Text: We consider notions of metrized categories, and then approximate categorical structures defined by a function of three variables generalizing the notion of 2-metric space
- Concepts: 'metrized categories', 'categorical structures', 'function of three variables', '2-metric space'

- Text: We prove an embedding theorem giving sufficient conditions for an approximate categorical structure to come from an inclusion into a metrized category.
- Concepts: 'embedding theorem', 'approximate categorical structure', 'inclusion', 'metrized category'

- Text: We give several reformulations of action representability of a category as well as action representability of its category of morphisms
- Concepts: 'action representability', 'category', 'morphisms'

- Text: In particular we show that for a semi-abelian category C, its category of morphisms is action representable if and only if the functor from the category of split extensions in C to C, sending a split extension to its kernel, is a prefibration
- Concepts: 'semi-abelian category', 'morphisms', 'action representable', 'functor', 'category of split extensions', 'kernel', 'prefibration'

- Text: To obtain these reformulations we show that certain conditions are equivalent for right regular spans of categories.
- Concepts: 'reformulations', 'conditions', 'right regular spans', 'categories'

- Text: We construct an operad Phyl whose operations are the edge-labelled trees used in phylogenetics
- Concepts: 'operad', 'edge-labelled trees', 'phylogenetics'

- Text: This operad is the coproduct of Com, the operad for commutative semigroups, and $[0,\infty)$, the operad with unary operations corresponding to nonnegative real numbers, where composition is addition
- Concepts: 'operad', 'coproduct', 'Com', 'commutative semigroups', '$[0,\infty)$', 'unary operations', 'nonnegative real numbers', 'composition', 'addition'

- Text: We show that there is a homeomorphism between the space of n-ary operations of Phyl and $\T_n\times [0,\infty)^{n+1}$, where $\T_n$ is the space of metric n-trees introduced by Billera, Holmes and Vogtmann
- Concepts: 'homeomorphism', 'n-ary operations', 'metric n-trees', 'space'

- Text: Furthermore, we show that the Markov models used to reconstruct phylogenetic trees from genome data give coalgebras of Phyl

- Concepts: 'Markov models', 'phylogenetic trees', 'genome data', 'coalgebras', 'Phyl'

- Text: These always extend to coalgebras of the larger operad Com + $[0,\infty]$, since Markov processes on finite sets converge to an equilibrium as time approaches infinity
- Concepts: 'coalgebras', 'operad', 'Markov processes'

- Text: We show that for any operad O, its coproduct with $[0,\infty]$ contains the operad W(O) constructed by Boardman and Vogt
- Concepts: 'operad', 'coproduct', 'Boardman and Vogt', 'W(O) construction'

- Text: To prove these results, we explicitly describe the coproduct of operads in terms of labelled trees.
- Concepts: 'coproduct of operads', 'labelled trees'

- Text: We define a right Cartan-Eilenberg structure on the category of Kan's combinatorial spectra, and the category of sheaves of such spectra, assuming some conditions
- Concepts: 'Cartan-Eilenberg structure', 'category', 'Kan', 'combinatorial spectra', 'sheaves'

- Text: In both structures, we use the geometric concept of homotopy equivalence as the strong equivalence
- Concepts: 'geometric concept', 'homotopy equivalence', 'strong equivalence'

- Text: In the case of sheaves, we use local equivalence as the weak equivalence
- Concepts: 'sheaves', 'local equivalence', 'weak equivalence'

- Text: This paper is the first step in a larger-scale program of investigating sheaves of spectra from a geometric viewpoint.
- Concepts: 'sheaves', 'spectra', 'geometric viewpoint'

- Text: The theory of derivators enhances and simplifies the theory of triangulated categories
- Concepts: 'derivators', 'triangulated categories', 'simplifies'

- Text: In this article a notion of fibered (multi)derivator is developed, which similarly enhances fibrations of (monoidal) triangulated categories
- Concepts: 'multi-derivator', 'fibered', 'fibrations', 'monoidal triangulated categories'

- Text: We present a theory of cohomological as well as homological descent in this language
- Concepts: 'cohomological descent', 'homological descent'

- Text: The main motivation is a descent theory for Grothendieck's six operations.
- Concepts: 'Grothendieck', 'six operations', 'descent theory'

- Text: We associate, in a functorial way, a monoidal bicategory Span|V to any monoidal bicategory V

- Concepts: 'monoidal bicategory', 'functorial', 'Span|V'

- Text: Two examples of this construction are of particular interest: Hopf polyads of Bruguieres can be seen as Hopf monads in Span|Cat while Hopf group monoids in the spirit of Zunino and Turaev in a braided monoidal category V, and Hopf categories of Batista-Caenepeel-Vercruysse over V both turn out to be Hopf monads in Span|V
- Concepts: 'construction', 'Hopf polyads', 'Hopf monads', 'Span|Cat', 'Hopf group monoids', 'Zunino', 'Turaev', 'braided monoidal category', 'Hopf categories', 'Batista-Caenepeel-Vercruysse', 'Span|V'

- Text: Hopf group monoids and Hopf categories are Hopf monads on a distinguished type of monoidales fitting the framework of Bohm-Lack
- Concepts: 'Hopf group monoids', 'Hopf categories', 'Hopf monads', 'monoidales', 'Bohm-Lack'

- Text: These examples are related by a monoidal pseudofunctor V -> Cat.
- Concepts: 'monoidal pseudofunctor', 'category'

- Text: The invertibility hypothesis for a monoidal model category S asks that localizing an S-enriched category with respect to an equivalence results in an weakly equivalent enriched category
- Concepts: 'invertibility hypothesis', 'monoidal model category', 'S-enriched category', 'localizing', 'equivalence', 'weakly

equivalent', 'enriched category'

- Text: This is the most technical among the axioms for S to be an excellent model category in the sense of Lurie, who showed that the category Cat_S of S-enriched categories then has a model structure with characterizable fibrant objects
- Concepts: axioms, model category, enriched categories, fibrant objects

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- Text: We use a universal property of cubical sets, as a monoidal model category, to show that the invertibility hypothesis is a consequence of the other axioms.
- Concepts: 'universal property', 'cubical sets', 'monoidal model category', 'invertibility hypothesis', 'axioms'

- Text: We introduce and study hypercrossed complexes of Lie algebras, that is, non-negatively graded chain complexes of Lie algebras $L=(L_n,\partial_n)$ endowed with an additional structure by means of a suitable set of bilinear maps $L_r\times L_s\rightarrow L_n$
- Concepts: 'hypercrossed complexes', 'non-negatively graded', 'chain complexes', 'Lie algebras', 'bilinear maps'

- Text: The Moore complex of any simplicial Lie algebra acquires such a structure and, in this way, we prove a Dold-Kan type equivalence between the category of simplicial Lie algebras and the category of hypercrossed complexes of Lie algebras

- Concepts: 'Moore complex', 'simplicial Lie algebra', 'Dold-Kan type equivalence', 'hypercrossed complexes', 'Lie algebras'

- Text: Several consequences of examining particular classes of hypercrossed complexes of Lie algebras are presented.
- Concepts: 'hypercrossed complex', 'Lie algebra'

- Text: We show that a commutative monoid A is coexponentiable in CMon(V) if and only if $-\otimes A : V \to V$ has a left adjoint, when V is a cocomplete symmetric monoidal closed category with finite biproducts and in which every object is a quotient of a free
- Concepts: 'commutative monoid', 'coexponentiable', 'CMon(V)', 'left adjoint', 'cocomplete', 'symmetric monoidal closed category', 'finite biproducts', 'quotient', 'free'

- Text: Using a general characterization of the latter, we show that an algebra over a rig or ring R is coexponentiable if and only if it is finitely generated and projective as an R-module
- Concepts: 'algebra', 'rig', 'ring', 'coexponentiable', 'finitely generated', 'projective', 'R-module'

- Text: Omitting the finiteness condition, the same result (and proof) is obtained for algebras over a quantale.
- Concepts: 'finiteness condition', 'algebras', 'quantale'

- Text: The key notion to understand the left determined Olschok model category of star-shaped Cattani-Sassone transition systems is past-similarity

- Concepts: 'left determined', 'Olschok model category', 'star-shaped', 'Cattani-Sassone', 'transition systems', 'past-similarity'

- Text: Two states are past-similar if they have homotopic pasts
- Concepts: 'homotopic', 'pasts'

- Text: An object is fibrant if and only if the set of transitions is closed under past-similarity
- Concepts: 'object', 'fibrant', 'set', 'transitions', 'closed', 'past-similarity'

- Text: A map is a weak equivalence if and only if it induces an isomorphism after the identification of all past-similar states
- Concepts: 'map', 'weak equivalence', 'isomorphism', 'identification', 'past-similar states'

- Text: The last part of this paper is a discussion about the link between causality and homotopy.
- Concepts: 'causality', 'homotopy'

- Text: As we all know, the complete lattice I_D(S) of all D-ideals of a meet-semilattice S is precisely the injective hull of S in the category of meet-semilattices
- Concepts: 'complete lattice', 'D-ideals', 'meet-semilattice', 'injective hull', 'category'

- Text: In this paper, we consider sm-ideals of posemigroups which can be regarded as a generalization of D-ideals of meet-semilattices
- Concepts: posemigroups, sm-ideals, generalization, D-ideals, meet-semilattices

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- Text: Unfortunately, the quantale R(S) of all sm-ideals of a posemigroup S is in general not an injective hull of S
- Concepts: 'quantale', 'sm-ideals', 'posemigroup', 'injective hull'

- Text: However, R(S) can be seen as a new type of quantale completions of S
- Concepts: quantale completions

- Text: Further, we can see that R(S) is also a free object over S in the category PoSgr_v of posemigroups with sm-distributive join homomorphisms.
- Concepts: 'free object', 'category', 'posemigroups', 'sm-distributive join homomorphisms'

- Text: We provide an explicit model for the free 2-category containing n composable adjunction morphisms, comparable to the Schanuel and Street model for the free adjunction
- Concepts: '2-category', 'adjunction morphisms', 'free 2-category', 'Schanuel and Street model', 'free adjunction'

- Text: We can extract from it an explicit model for the free 2-category containing n composable lax monad morphisms

- Concepts: '2-category', 'composable', 'lax monad', 'morphisms', 'explicit model', 'free 2-category'

- Text: A careful proof is given, which goes through presentations of the hom-categories of our model
- Concepts: 'presentations', 'hom-categories', 'model'

- Text: We use one of these hom-categories as an indexing category to construct an extended Artin-Mazur codiagonal, whose underlying bisimplicial set has the classical Artin-Mazur codiagonal as its first column.
- Concepts: 'hom-categories', 'indexing category', 'extended Artin-Mazur codiagonal', 'underlying bisimplicial set', 'classical Artin-Mazur codiagonal', 'first column'

- Text: For each holomorphic vector bundle we construct a holomorphic bundle 2-gerbe that geometrically represents its second Beilinson-Chern class
- Concepts: 'holomorphic vector bundle', 'holomorphic bundle', '2-gerbe', 'Beilinson-Chern class'

- Text: Applied to the cotangent bundle, this may be regarded as a higher analogue of the canonical line bundle in complex geometry
- Concepts: 'cotangent bundle', 'higher analogue', 'canonical line bundle', 'complex geometry'

- Text: Moreover, we exhibit the precise relationship between holomorphic and smooth gerbes

- Concepts: 'holomorphic gerbes', 'smooth gerbes', 'relationship'

- Text: For example, we introduce an Atiyah class for gerbes and prove a Koszul-Malgrange type theorem.
- Concepts: 'Atiyah class', 'gerbes', 'Koszul-Malgrange theorem', 'theorem'

- Text: If C is a category with pullbacks then there is a bicategory with the same objects as C, spans as morphisms, and maps of spans as 2-morphisms, as shown by Benabou
- Concepts: 'category', 'pullbacks', 'bicategory', 'objects', 'spans', 'morphisms', 'maps of spans', '2-morphisms'

- Text: Fong has developed a theory of `decorated cospans', which are cospans in C equipped with extra structure
- Concepts: 'decorated cospans', 'cospans'

- Text: This extra structure arises from a symmetric lax monoidal functor F : C --> D; we use this functor to `decorate' each cospan with apex N in C with an element of F(N)
- Concepts: 'symmetric lax monoidal functor', 'cospan', 'apex', 'element', 'decorate'

- Text: Using a result of Shulman, we show that when C has finite colimits, decorated cospans are morphisms in a symmetric monoidal bicategory
- Concepts: 'finite colimits', 'decorated cospans', 'morphisms', 'symmetric monoidal bicategory'

- Text: We illustrate our construction with examples from electrical engineering and the theory of chemical reaction networks.
- Concepts: 'construction', 'electrical engineering', 'theory', 'chemical reaction networks'

- Text: We associate to a bimonoidal functor, i.e
- Concepts: 'bimonoidal functor'

- Text: a bifunctor which is monoidal in each variable, a nonabelian version of a biextension
- Concepts: bifunctor, monoidal, nonabelian, biextension

- Text: We show that such a biextension satisfies additional triviality conditions which make it a bilinear analog of the kind of spans known as butterflies and, conversely, these data determine a bimonoidal functor
- Concepts: 'biextension', 'triviality conditions', 'bilinear', 'spans', 'butterflies', 'bimonoidal functor'

- Text: We extend this result to n-variables, and prove that, in a manner analogous to that of butterflies, these multi-extensions can be composed
- Concepts: 'n-variables', 'multi-extensions', 'composed'

- Text: This is phrased in terms of a multilinear functor calculus in a bicategory
- Concepts: 'multilinear functor', 'functor calculus', 'bicategory'

- Text: As an application, we study a bimonoidal category or stack, treating the multiplicative structure as a bimonoidal functor with respect to the additive one
- Concepts: bimonoidal category', 'stack', 'multiplicative structure', 'bimonoidal functor', 'additive structure'

- Text: In the context of the multilinear functor calculus, we view the bimonoidal structure as an instance of the general notion of pseudo-monoid
- Concepts: 'multilinear functor calculus', 'bimonoidal structure', 'general notion', 'pseudo-monoid'

- Text: We show that when the structure is ring-like, i.e
- Concepts: 'ring-like', 'structure'

- Text: the pseudo-monoid is a stack whose fibers are categorical rings, we can recover the classification by the third Mac~Lane cohomology of a ring with values in a bimodule.
- Concepts: 'pseudo-monoid', 'stack', 'categorical rings', 'classification', 'Mac~Lane cohomology', 'ring', 'bimodule'

- Text: Starting from the observation that through groupoids we can express in a unified way the notions of fundamental system of entourages of a uniform structure on a space X, respectively the system of neighborhoods of the unity of a topological group that determines its topology, we introduce in this paper a notion of G-uniformity for a groupoid G

- Concepts: 'groupoids', 'fundamental system of entourages', 'uniform structure', 'topological group', 'neighborhoods of the unity', 'G-uniformity'

- Text: The topology induced by a G-uniformity turns G into a topological locally transitive groupoid
- Concepts: 'G-uniformity', 'topology', 'topological', 'locally transitive groupoid'

- Text: We also prove a Urysohn type lemma for groupoids and obtain metrization theorems for groupoids unifying in two ways the Alexandroff-Urysohn Theorem and Birkhoff-Kakutani Theorem.
- Concepts: 'Urysohn type lemma', 'groupoids', 'metrization theorems', 'Alexandroff-Urysohn Theorem', 'Birkhoff-Kakutani Theorem'

- Text: Connections are an important tool of differential geometry
- Concepts: 'connections', 'differential geometry'

- Text: This paper investigates their definition and structure in the abstract setting of tangent categories
- Concepts: 'tangent categories'

- Text: At this level of abstraction we derive several classically important results about connections, including the Bianchi identities, identities for curvature and torsion, almost complex structure, and parallel transport.

- Concepts: abstraction, connections, Bianchi identities, curvature, torsion, almost complex structure, parallel transport

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- Text: In this paper we give an isomorphic description of the category of non-Archimedian approach spaces as a category of lax algebras for the ultrafilter monad and an appropriate quantale
- Concepts: 'category', 'approach spaces', 'lax algebras', 'ultrafilter monad', 'quantale'

- Text: Non-Archimedean approach spaces are characterised as those approach spaces having a tower consisting of topologies
- Concepts: 'Non-Archimedean', 'approach spaces', 'tower', 'topologies'

- Text: We study topological properties p, for p compactness and Hausdorff separation along with low-separation properties, regularity, normality and extremal disconnectedness and link these properties to the condition that all or some of the level topologies in the tower have p
- Concepts: 'topological properties', 'compactness', 'Hausdorff separation', 'low-separation properties', 'regularity', 'normality', 'extremal disconnectedness', 'level topologies', 'tower'

- Text: A compactification technique is developed based on Shanin's method.
- Concepts: 'compactification', 'Shanin method'

- Text: We prove a fundamental lemma of homological algebra and show how it sets a framework for many different lifting (or comparison) theorems of homological algebra and algebraic topology
- Concepts: 'fundamental lemma', 'homological algebra', 'lifting theorem', 'comparison theorem', 'algebraic topology'

- Text: Among these are different versions of the acyclic models method.
- Concepts: 'acyclic models method'

- Text: We present an axiomatic theory, based on the notions of metric space and space with a (first order) neighbour relation
- Concepts: 'axiomatic theory', 'metric space', 'neighbour relation'

- Text: The axiomatics implies a synthetic proof of Huygens' principle of wave fronts, as envelopes of a family of spheres
- Concepts: 'axiomatics', 'synthetic proof', 'Huygens' principle', 'wave fronts', 'envelopes', 'family of spheres'

- Text: A model of the axiomatics is presented in terms of synthetic differential geometry (SDG).
- Concepts: 'axiomatics', 'synthetic differential geometry', 'SDG'

- Text: We define a Levi category to be a weakly orthogonal category equipped with a suitable length functor and prove two main theorems about them

- Concepts: 'Levi category', 'weakly orthogonal category', 'length functor', 'main theorems'

- Text: First, skeletal cancellative Levi categories are precisely the categorical versions of graphs of groups with a given orientation
- Concepts: 'Levi categories', 'categorical versions', 'graphs', 'groups', 'orientation'

- Text: Second, the universal groupoid of a skeletal cancellative Levi category is the fundamental groupoid of the corresponding graph of groups
- Concepts: 'universal groupoid', 'skeletal cancellative Levi category', 'fundamental groupoid', 'graph of groups'

- Text: These two results can be viewed as a co-ordinate-free refinement of a classical theorem of Philip Higgins.
- Concepts: 'co-ordinate-free refinement', 'classical theorem'

- Text: We show that a fully faithful and covering regular functor between regular categories induces a fully faithful (and covering) functor between their respective effectivizations
- Concepts: 'fully faithful', 'covering', 'regular functor', 'regular categories', 'effectivizations'

- Text: Such a functor between effective categories is known to be an equivalence
- Concepts: functor', 'effective categories', 'equivalence'

- Text: We exploit this result in order to give a constructive proof of conceptual completeness for regular logic
- Concepts: 'constructive proof', 'conceptual completeness', 'regular logic'

- Text: We also use it in analyzing what it means for a morphism between effective categories to be a quotient in the 2-category of effective categories and regular functors between them.
- Concepts: 'morphism', 'effective categories', 'quotient', '2-category', 'regular functors'

- Text: For a small quantaloid Q we consider four fundamental 2-monads T on Q-Cat, given by the presheaf 2-monad P and the copresheaf 2-monad P^{\dagger}, as well as by their two composite 2-monads, and establish that they all laxly distribute over P
- Concepts: 'quantaloid', '2-monads', 'presheaf 2-monad', 'copresheaf 2-monad', 'composite 2-monads', 'laxly distribute', 'Q-Cat'

- Text: These four 2-monads therefore admit lax extensions to the category Q-Dist of Q-categories and their distributors
- Concepts: '2-monads', 'lax extensions', 'category', 'Q-Dist', 'Q-categories', 'distributors'

- Text: We characterize the corresponding (T,Q)-categories in each of the four cases, leading us to both known and novel categorical structures.

- Concepts: 'categories', '(T,Q)-categories', 'categorical structures'

- Text: We give several new ways of constructing spectral spaces starting with objects in abelian categories satisfying certain conditions which apply, in particular, to Grothendieck categories
- Concepts: 'spectral spaces', 'constructing', 'abelian categories', 'Grothendieck categories', 'conditions'

- Text: For this, we consider the spaces of invariants of closure operators acting on subobjects of a given object
- Concepts: 'invariants', 'closure operators', 'subobjects'

- Text: The key to our results is a newly discovered criterion of Finocchiaro that uses ultrafilters to identify spectral spaces along with subbases of quasi-compact open sets.
- Concepts: 'criterion', 'ultrafilters', 'spectral spaces', 'subbases', 'quasi-compact', 'open sets'

- Text: Finitary monads on a locally finitely presentable category A are well-known to possess a presentation by signatures and equations
- Concepts: 'finitary monads', 'locally finitely presentable category', 'presentation', 'signatures', 'equations'

- Text: Here we prove that, analogously, bases on A, i.e., finitary functors from A to the category of finitary monads on A, possess a presentation by parametrized signatures and equations.

- Concepts: finitary functor', 'category', 'monad', 'presentation', 'parametrized signature', 'equation'

- Text: We explicitly show that symmetric Frobenius structures on a finite-dimensional, semi-simple algebra stand in bijection to homotopy fixed points of the trivial SO(2)-action on the bicategory of finite-dimensional, semi-simple algebras, bimodules and intertwiners
- Concepts: 'symmetric Frobenius structures', 'finite-dimensional', 'semi-simple algebra', 'homotopy fixed points', 'SO(2)-action', 'bicategory', 'bimodules', 'intertwiners'

- Text: The results are motivated by the 2-dimensional Cobordism Hypothesis for oriented manifolds, and can hence be interpreted in the realm of Topological Quantum Field Theory.
- Concepts: '2-dimensional', 'Cobordism Hypothesis', 'oriented manifolds', 'Topological Quantum Field Theory'

- Text: Databases have been studied category-theoretically for decades
- Concepts: 'databases', 'category-theoretically'

- Text: While mathematically elegant, previous categorical models have typically struggled withrepresenting concrete data such as integers or strings
- Concepts: categorical models, integers, strings

- Text: In the present work, we propose an extension of the earlier set-valued functor model, making use of multi-sorted algebraic theories (a.k.a
- Concepts: set-valued functor model', 'multi-sorted algebraic theories'

- Text: Lawvere theories) to incorporate concrete data in a principled way
- Concepts: 'Lawvere theories', 'concrete data'

- Text: This approach easily handles missing information (null values), and also allows constraints and queries to make use of operations on data, such as multiplication or comparison of numbers, helping to bridge the gap between traditional databases and programming languages
- Concepts: 'missing information', 'null values', 'constraints', 'queries', 'operations', 'data', 'multiplication', 'comparison', 'numbers', 'databases', 'programming languages'

- Text: We also show how all of the components of our model - including schemas, instances, change-of-schema functors, and queries fit into a single double categorical structure called a proarrow equipment (a.k.a
- Concepts: model, schemas, instances, change-of-schema functors, queries, double categorical structure, proarrow equipment

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- Text: framed bicategory).

- Concepts: 'framed bicategory'

- Text: The author and Tomer Schlank studied a much weaker homotopical structure than a model category, which we called a "weak cofibration category"
- Concepts: 'homotopical structure', 'model category', 'weak cofibration category'

- Text: We showed that a small weak cofibration category induces in a natural way a model category structure on its ind-category, provided the ind-category satisfies a certain two out of three property
- Concepts: 'weak cofibration category', 'model category structure', 'ind-category', 'two out of three property'

- Text: The main purpose of this paper is to give sufficient intrinsic conditions on a weak cofibration category for this two out of three property to hold
- Concepts: 'weak cofibration category', 'two out of three property'

- Text: We consider an application to the category of compact metrizable spaces, and thus obtain a model structure on its ind-category
- Concepts: 'category', 'model structure', 'compact metrizable spaces', 'ind-category'

- Text: This model structure is defined on a category that is closely related to a category of topological spaces and has many convenient formal properties

- Concepts: 'model structure', 'category', 'topological spaces', 'formal properties'

- Text: A more general application of these results, to the (opposite) category of separable C^*-algebras, appears in a paper by the author, Michael Joachim and Snigdhayan Mahanta.
- Concepts: 'category', 'opposite category', 'separable', 'C^*-algebras'

- Text: We will construct a Quillen model structure out of the multiplier ideal sheaves on a smooth quasi-projective variety using earlier works of Isaksen and Barnea and Schlank
- Concepts: 'Quillen model structure', 'multiplier ideal sheaves', 'smooth', 'quasi-projective variety'

- Text: We also show that fibrant objects of this model category are made of kawamata log terminal pairs in birational geometry.
- Concepts: 'model category', 'fibrant objects', 'kawamata log terminal pairs', 'birational geometry'

- Text: Picard-Vessiot rings are present in many settings like differential Galois theory, difference Galois theory and Galois theory of Artinian simple module algebras
- Concepts: 'Picard-Vessiot rings', 'differential Galois theory', 'difference Galois theory', 'Galois theory', 'Artinian', 'simple module algebras'

- Text: In this article we set up an abstract framework in which we can prove theorems on existence and uniqueness of Picard-Vessiot rings, as well as on Galois groups corresponding to the Picard-Vessiot rings
- Concepts: 'abstract framework', 'theorems', 'existence', 'uniqueness', 'Picard-Vessiot rings', 'Galois groups'

- Text: As the present approach restricts to the categorical properties which all the categories of differential modules resp.~difference modules etc.~share, it gives unified proofs for all these Galois theories (and maybe more general ones).
- Concepts: 'categorical properties', 'categories', 'differential modules', 'difference modules', 'Galois theories'

- Text: On a category $\mathscr{C}$ with a designated (well-behaved) class $\mathcal{M}$ of monomorphisms, a closure operator in the sense of D.~Dikranjan and E.~Giuli is a pointed endofunctor of $\mathcal{M}$, seen as a full subcategory of the arrow-category $\mathscr{C}^\mathbf{2}$ whose objects are morphisms from the class $\mathcal{M}$, which ``commutes'' with the codomain functor $\mathsf{cod}\colon \mathcal{M}\to \mathscr{C}$
- Concepts: 'category', 'class', 'monomorphisms', 'closure operator', 'endofunctor', 'arrow-category', 'codomain functor'

- Text: In other words, a closure operator consists of a functor $C\colon \mathcal{M}\to\mathcal{M}$ and a natural transformation $c\colon 1_\mathcal{M}\to C$ such that

$\mathsf{cod} \cdot C=C$ and $\mathsf{cod}\cdot c=1_\mathsf{cod}$

- Concepts: 'closure operator', 'functor', 'natural transformation', 'category'

- Text: In this paper we adapt this notion to the domain functor $\mathsf{dom}\colon \mathcal{E}\to\mathscr{C}$, where $\mathcal{E}$ is a class of epimorphisms in $\mathscr{C}$, and show that such closure operators can be used to classify $\mathcal{E}$-epireflective subcategories of $\mathscr{C}$, provided $\mathcal{E}$ is closed under composition and contains isomorphisms.
- Concepts: domain functor, class of epimorphisms, closure operators, epireflective subcategories, isomorphisms, composition

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- Text: Guided by the microcosm principle of Baez-Dolan and by the algebraic definitions of operads of Kelly and Fiore, we introduce two ``monoid-like'' definitions of cyclic operads, one for the original, ``exchangable-output'' characterisation of Getzler-Kapranov, and the other for the alternative ``entries-only'' characterisation, both within the category of Joyal's species of structures
- Concepts: 'microcosm principle', 'operads', 'monoid', 'cyclic operads', 'Getzler-Kapranov', 'Joyal's species of structures'

- Text: Relying on a result of Lamarche on descent for species, we use these "monoid-like" definitions to prove the equivalence between the ``exchangable-output'' and ``entries-only'' points of view on cyclic operads.

- Concepts: 'descent', 'species', 'monoid-like definitions', 'equivalence', 'exchangable-output', 'entries-only', 'cyclic operads'

- Text: At the heart of differential geometry is the construction of the tangent bundle of a manifold
- Concepts: 'differential geometry', 'tangent bundle', 'manifold'

- Text: There are various abstractions of this construction, and of particular interest here is that of Tangent Structures
- Concepts: 'abstractions', 'construction', 'Tangent Structures'

- Text: Tangent Structure is defined via giving an underlying category M and a tangent functor T along with a list of natural transformations satisfying a set of axioms, then detailing the behaviour of T in the category End(M)
- Concepts: 'Tangent Structure', 'category', 'tangent functor', 'natural transformations', 'axioms', 'End(M)'

- Text: However, this axiomatic definition at first seems somewhat disjoint from other approaches in differential geometry
- Concepts: 'axiomatic definition', 'differential geometry'

- Text: The aim of this paper is to present a perspective that addresses this issue
- Concepts: none - The context does not mention any specific math concepts.

- Text: More specifically, this paper highlights a very explicit relationship between the axiomatic definition of Tangent Structure and the Weil algebras (which have a well established place in differential geometry).
- Concepts: 'Tangent Structure', 'axiomatic definition', 'Weil algebras', 'differential geometry'

- Text: Just as binary relations between sets may be understood as jointly monic spans, so too may equivalence relations on the disjoint union of sets be understood as jointly epic cospans
- Concepts: 'binary relations', 'sets', 'jointly monic spans', 'equivalence relations', 'disjoint union', 'jointly epic cospans'

- Text: With the ensuing notion of composition inherited from the pushout of cospans, we call these equivalence relations corelations
- Concepts: 'composition', 'pushout', 'cospans', 'equivalence relations', 'corelations'

- Text: We define the category of corelations between finite sets and prove that it is equivalent to the prop for extraspecial commutative Frobenius monoids
- Concepts: 'category', 'corelations', 'finite sets', 'prop', 'extraspecial commutative Frobenius monoids'

- Text: Dually, we show that the category of relations is equivalent to the prop for special commutative bimonoids

- Concepts: category', 'relations', 'prop', 'special commutative bimonoids'

- Text: Throughout, we emphasise how corelations model interconnection.
- Concepts: 'corelations', 'interconnection', 'model'

- Text: Given an order-enriched category, it is known that all its KZ-monadic subcategories can be described by Kan-injectivity with respect to a collection of morphisms
- Concepts: 'order-enriched category', 'KZ-monadic subcategories', 'Kan-injectivity', 'morphisms'

- Text: We prove the analogous result for Kan-injectivity with respect to a collection H of commutative squares
- Concepts: 'Kan-injectivity', 'commutative squares'

- Text: A square is called a Kan-injective consequence of H if by adding it to H Kan-injectivity is not changed
- Concepts: 'square', 'Kan-injective', 'consequence'

- Text: We present a sound logic for Kan-injectivity consequences and prove that in ``reasonable'' categories (such as $\Pos$ or $\Top_0$) it is also complete for every set H of squares.
- Concepts: Kan-injectivity consequences', 'sound logic', 'categories', 'pos', 'topology', 'complete', 'set', 'squares'

- Text: One way to define Witt vectors starts with a truncation set $S \subset N$
- Concepts: 'Witt vectors', 'truncation set'

- Text: We generalize Witt vectors to truncation posets, and show how three types of maps of truncation posets can be used to encode the following six structure maps on Witt vectors: addition, multiplication, restriction, Frobenius, Verschiebung and norm.
- Concepts: Witt vectors', 'truncation posets', 'structure maps', 'addition', 'multiplication', 'restriction', 'Frobenius', 'Verschiebung', 'norm'

- Text: In this note, we prove the existence of $E_\leq$-injective hulls in the category $PoSgr_\leq$ of posemigroups and their submultiplicative order-preserving maps; here $E_\leq$ denotes the class of those morphisms $h : A \to B$ for which $h(a_1)...h(a_n)\leq h(a)$ always implies $a_1...a_n\leq a$
- Concepts: '$E_\leq$-injective hulls', 'category', 'posemigroups', 'submultiplicative', 'order-preserving maps', 'morphisms'

- Text: The result of this note subsumes the results given by Lambek et al
- Concepts: 'Lambek', 'results'

- Text: (2012) and by Zhang and Laan (2014).
- Concepts: None (Note: The given context does not mention any math concepts)

- Text: Normal monomorphisms in the sense of Bourn describe the equivalence classes of an internal equivalence relation
- Concepts: 'normal monomorphisms', 'Bourn', 'equivalence classes', 'internal equivalence relation'

- Text: Although the definition is given in the fairly general setting of a category with finite limits, later investigations on this subject often focus on protomodular settings, where normality becomes a property
- Concepts: 'category', 'finite limits', 'protomodular', 'normality'

- Text: This paper clarifies the connections between internal equivalence relations and Bourn-normal monomorphisms in regular Mal'tesv categories with pushouts of split monomorphisms along arbitrary morphisms, whereas a full description is achieved for quasi-pointed regular Mal'tsev categories with pushouts of split monomorphisms along arbitrary morphisms.
- Concepts: 'equivalence relations', 'Bourn-normal monomorphisms', 'Mal'tsev categories', 'pushouts', 'split monomorphisms', 'quasi-pointed'

- Text: We study the existence and left properness of transferred model structures for ``monoid-like'' objects in monoidal model categories
- Concepts: 'monoid-like objects', 'model structures', 'monoidal model categories', 'existence', 'left properness', 'transferred'

- Text: These include genuine monoids, but also all kinds of operads as for instance symmetric, cyclic, modular, higher operads, properads and PROP's
- Concepts: 'monoids', 'operads', 'symmetric operads', 'cyclic operads', 'modular operads', 'higher operads', 'prooperads', 'PROPs'

- Text: All these structures can be realised as algebras over polynomial monads
- Concepts: 'algebras', 'polynomial monads'

- Text: We give a general condition for a polynomial monad which ensures the existence and (relative) left properness of a transferred model structure for its algebras
- Concepts: 'polynomial monad', 'existence', 'left properness', 'transferred model structure', 'algebras'

- Text: This condition is of a combinatorial nature and singles out a special class of polynomial monads which we call tame polynomial
- Concepts: 'combinatorial', 'polynomial monads', 'tame polynomial'

- Text: Many important monads are shown to be tame polynomial.
- Concepts: 'monads', 'tame polynomial'

- Text: We define the notion of a $(P,\tilde{P})$-structure on a universe p in a locally cartesian closed category category with a binary product structure and construct a (Π,λ)-structure on the C-systems $CC(C,p)$ from a $(P,\tilde{P})$-structure on p

- Concepts: universe, locally cartesian closed category, binary product structure, $(P,\tilde{P})$-structure, (Π,λ)-structure, C-systems

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- Text: We then define homomorphisms of C-systems with (Π,λ)-structures and functors of universe categories with $(P,\tilde{P})$-structures and show that our construction is functorial relative to these definitions.
- Concepts: 'homomorphisms', 'C-systems', '(Π,λ)-structures', 'functors', 'universe categories', '$(P,\tilde{P})$-structures', 'functorial'

- Text: The main result of this paper may be stated as a construction of "almost representations" μ_n and $\tilde{\mu}_n$ for the presheaves $\Ob_n$ and $\tilde{Ob}_n$ on the C-systems defined by locally cartesian closed universe categories with binary product structures and the study of the behavior of these "almost representations" with respect to the universe category functors
- Concepts: 'presheaves', 'locally cartesian closed', 'universe categories', 'binary product structures', 'representations', 'C-systems', 'functors'

- Text: In addition, we study a number of constructions on presheaves on C-systems and on universe categories that are used in the proofs of our main results, but are expected to have other applications as well.

- Concepts: 'presheaves', 'C-systems', 'universe categories', 'proofs', 'main results', 'applications'

- Text: We introduce a functor called the simplicial nerve of an A_∞-category defined on the category of A_∞-categories with values in simplicial sets
- Concepts: 'functor', 'simplicial nerve', 'A_∞-category', 'category', 'simplicial sets'

- Text: We show that the nerve of an A_∞-category is an $(\infty,1)$-category in the sense of J
- Concepts: 'A_∞-category', 'nerve', '$(\infty,1)$-category', 'J'

- Text: Lurie
- Concepts: Lurie (It is unclear if Lurie refers to a person or a math concept. Without further context, it cannot be determined if this is a relevant concept.)

- Text: This construction generalizes the nerve construction for differential graded categories given by Lurie
- Concepts: 'construction', 'generalizes', 'nerve construction', 'differential graded categories', 'Lurie'

- Text: We prove that if a differential graded category is pretriangulated in the sense of A.I
- Concepts: 'differential graded category', 'pretriangulated', 'A.I'

- Text: Bondal and M
- Concepts: None given, as the context provides insufficient information to identify any math concepts.

- Text: Kapranov then its nerve is a stable $(\infty,1)$-category in the sense of J
- Concepts: 'stable', '$(\infty,1)$-category', 'nerve'

- Text: Lurie.
- Concepts: No math concepts are mentioned in this context.

- Text: We consider Toeplitz and Cuntz-Krieger C^*-algebras associated with fin\-itely aligned left cancellative small categories
- Concepts: 'Toeplitz', 'Cuntz-Krieger', 'C^*-algebras', 'left cancellative', 'small categories'

- Text: We pay special attention to the case where such a category arises as the Zappa-Szep product of a category and a group linked by a one-cocycle
- Concepts: 'category', 'Zappa-Szep product', 'group', 'one-cocycle'

- Text: As our main application, we obtain a new approach to Exel-Pardo algebras in the case of row-finite graphs
- Concepts: 'Exel-Pardo algebras', 'row-finite graphs'

- Text: We also present some other ways of constructing C^*-algebras from left cancellative small categories and discuss their relationship.

- Concepts: 'C^*-algebras', 'left cancellative', 'small categories', 'constructing', 'relationship'

- Text: Coarse-graining is a standard method of extracting a simpler Markov process from a more complicated one by identifying states
- Concepts: 'Coarse-graining', 'Markov process', 'identifying states'

- Text: Here we extend coarse-graining to `open' Markov processes: that is, those where probability can flow in or out of certain states called `inputs' and `outputs'
- Concepts: 'coarse-graining', 'Markov processes', 'probability', 'inputs', 'outputs'

- Text: One can build up an ordinary Markov process from smaller open pieces in two basic ways: composition, where we identify the outputs of one open Markov process with the inputs of another, and tensoring, where we set two open Markov processes side by side
- Concepts: 'Markov process', 'open Markov process', 'composition', 'identification', 'tensoring', 'side by side'

- Text: In previous work, Fong, Pollard and the first author showed that these constructions make open Markov processes into the morphisms of a symmetric monoidal category
- Concepts: Markov processes', 'open Markov processes', 'morphisms', 'symmetric monoidal category'

- Text: Here we go further by constructing a symmetric monoidal double category where the 2-morphisms include ways of coarse-graining open Markov processes
- Concepts: 'symmetric monoidal double category', '2-morphisms', 'coarse-graining', 'open Markov processes'

- Text: We also extend the already known `black-boxing' functor from the category of open Markov processes to our double category
- Concepts: 'open Markov processes', 'category', 'double category', 'functor'

- Text: Black-boxing sends any open Markov process to the linear relation between input and output data that holds in steady states, including nonequilibrium steady states where there is a nonzero flow of probability through the process
- Concepts: 'Markov process', 'linear relation', 'steady states', 'nonequilibrium steady states', 'flow of probability'

- Text: To extend black-boxing to a functor between double categories, we need to prove that black-boxing is compatible with coarse-graining.
- Concepts: double categories, functor, black-boxing, compatible, coarse-graining

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- Text: It has been shown by J.Funk, P.Hofstra and B.Steinberg that any Grothendieck topos T is endowed with a canonical group object, called its isotropy group, which acts functorially on every object of the topos

- Concepts: 'Grothendieck topos', 'canonical group object', 'isotropy group', 'functorially', 'object of the topos'

- Text: We show that this group is in fact the group of points of a localic group object, called the localic isotropy group, which also acts on every object, and in fact also on every internal locale and on every T-topos
- Concepts: 'localic group object', 'localic isotropy group', 'object', 'internal locale', 'T-topos'

- Text: This new localic isotropy group has better functoriality and stability property than the original version and sheds some light on the phenomenon of higher isotropy observed for the ordinary isotropy group
- Concepts: 'localic isotropy group', 'functoriality', 'stability property', 'higher isotropy', 'ordinary isotropy group'

- Text: We prove in particular using a localic version of the isotropy quotient that any geometric morphism can be factored uniquely as a connected atomic geometric morphism followed by a so called ``essentially anisotropic'' geometric morphism, and that connected atomic morphisms are exactly the quotients by open isotropy actions, hence providing a form of Galois theory for general (unpointed) connected atomic geometric morphisms.
- Concepts: 'localic version', 'isotropy quotient', 'geometric morphism', 'connected atomic geometric morphism', 'essentially anisotropic', 'quotients by open isotropy acciones', 'Galois theory'

- Text: The present article is the first of a series whose goal is to define a logical formalism in which it is possible to reason about genetics
- Concepts: 'logical formalism', 'reason', 'genetics'

- Text: In this paper, we introduce the main concepts of our language whose domain of discourse consists of a class of limit-sketches and their associated models
- Concepts: 'language', 'domain of discourse', 'class', 'limit-sketches', 'models'

- Text: While our program will aim to show that different phenomena of genetics can be modeled by changing the category in which the models take their values, in this paper, we study models in the category of sets to capture mutation mechanisms such as insertions, deletions, substitutions, duplications and inversions
- Concepts: 'category', 'models', 'category of sets', 'mutation mechanisms', 'insertions', 'deletions', 'substitutions', 'duplications', 'inversions'

- Text: We show how the proposed formalism can be used for constructing multiple sequence alignments with an emphasis on mutation mechanisms.
- Concepts: 'formalism', 'multiple sequence alignments', 'mutation mechanisms'

- Text: We show that a Hopf monad on a *-autonomous category lifts *-autonomous structure to the category of algebras precisely when there is an algebra structure on the dualizing object
- Concepts: Hopf monad', '*-autonomous category', 'lifts', '*-autonomous structure', 'category of algebras', 'algebra structure', 'dualizing object'

- Text: Our proof is based on Pastro's characterization of *-autonomous (co)monads as linearly distributive (co)monads with negation.
- Concepts: *-autonomous, (co)monads, linearly distributive, negation

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- Text: We study the structure of the category of polynomials in a locally cartesian closed category
- Concepts: 'category', 'polynomials', 'locally cartesian closed category', 'structure'

- Text: Formalizing the conceptual view that polynomials are constructed from sums and products, we characterize this category in terms of the composite of the pseudomonads which freely add fibred sums and products to fibrations
- Concepts: 'polynomials', 'sums', 'products', 'category', 'pseudomonads', 'fibred sums', 'fibrations'

- Text: The composite pseudomonad structure corresponds to a pseudo-distributive law between these two pseudomonads, which exists if and only if the base category is locally cartesian closed.

- Concepts: 'pseudomonad', 'composite pseudomonad', 'pseudo-distributive law', 'base category', 'locally cartesian closed'

- Text: The Faa di Bruno construction, introduced by Cockett and Seely, constructs a comonad Faa whose coalgebras are precisely Cartesian differential categories
- Concepts: 'Faa di Bruno construction', 'comonad', 'coalgebras', 'Cartesian differential categories'

- Text: In other words, for a Cartesian left additive category X, Faa(X) is the cofree Cartesian differential category over X
- Concepts: 'Cartesian', 'left additive category', 'cofree', 'differential category'

- Text: Composition in these cofree Cartesian differential categories is based on the Faa di Bruno formula, and corresponds to composition of differential forms
- Concepts: 'cofree', 'Cartesian differential categories', 'Faa di Bruno formula', 'composition', 'differential forms'

- Text: This composition, however, is somewhat complex and difficult to work with
- Concepts: composition', 'complex', 'difficult'

- Text: In this paper we provide an alternative construction of cofree Cartesian differential categories inspired by tangent categories

- Concepts: 'cofree Cartesian differential categories', 'tangent categories'

- Text: In particular, composition defined here is based on the fact that the chain rule for Cartesian differential categories can be expressed using the tangent functor, which simplifies the formulation of the higher order chain rule.
- Concepts: 'composition', 'chain rule', 'Cartesian differential categories', 'tangent functor', 'higher order chain rule'

- Text: In this paper, we introduce the concept of a topological space in the topos M-Set of M-sets, for a monoid M
- Concepts: 'topological space', 'topos', 'M-Set', 'monoid'

- Text: We do this by replacing the notion of open "subset" by open "subobject" in the definition of a topology
- Concepts: 'open subobject', 'topology', 'notion'

- Text: We prove that the resulting category has an open subobject classifier, which is the counterpart of the Sierpinski space in this topos
- Concepts: 'category', 'open subobject classifier', 'Sierpinski space', 'topos'

- Text: We also study the relation between the given notion of topology and the notion of a poset in this universe
- Concepts: 'topology', 'poset', 'notion'

- Text: In fact, the counterpart of the specialization pre-order is given for topological spaces in M-Set, and it is shown that, similar to the classic case, for a special kind of topological spaces in M-Set, namely T_0 ones, it is a partial order
- Concepts: 'specialization pre-order', 'topological spaces', 'M-Set', 'T_0 topological spaces', 'partial order'

- Text: Furthermore, we obtain the universal T_0 space, and give the adjunction between topological spaces and T_0 posets, in M-Set.
- Concepts: 'universal T_0 space', 'adjunction', 'topological spaces', 'T_0 posets'

- Text: In this paper, we prove that there is a canonical homotopy (n+1)-algebra structure on the shifted operadic deformation complex $\Def(e_n\to\mathcal{P})[-n]$ for any operad $\mathcal{P}$ and a map of operads $f\colon e_n\to\mathcal{P}$
- Concepts: homotopy, algebra structure, operadic deformation complex, operad, map of operads

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- Text: This result generalizes a result of Tamarkin, who considered the case $\mathcal{P}=\End_\Op(X)$
- Concepts: 'generalizes', 'result', 'Tamarkin', 'case', 'End', 'Op', 'X'

- Text: Another more computational proof of the same result was recently sketched by Calaque and Willwacher. Our method combines the one of Tamarkin, with the categorical algebra on the category of symmetric sequences, introduced by Rezk and further developed by Kapranov-Manin and Fresse

- Concepts: computational proof, categorical algebra, symmetric sequences, Tamarkin method, Rezk, Kapranov-Manin, Fresse

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- Text: We define suitable deformation functors on n-coalgebras, which are considered as the "non-commutative" base of deformation, prove their representability, and translate properties of the functors to the corresponding properties of the representing objects
- Concepts: 'deformation functor', 'n-coalgebras', 'non-commutative', 'representability', 'representing objects'

- Text: A new point, which makes the method more powerful, is to consider the argument of our deformation theory as an object of the category of symmetric sequences of dg vector spaces, not as just a single dg vector space .
- Concepts: 'deformation theory', 'symmetric sequences', 'dg vector spaces', 'category'

- Text: Quantum categories have been recently studied because of their relation to bialgebroids, small categories, and skew monoidales
- Concepts: Quantum categories', 'bialgebroids', 'small categories', 'skew monoidales'

- Text: This is the first of a series of papers based on the author's PhD thesis in which we examine the theory of quantum categories developed by Day, Lack, and Street

- Concepts: 'quantum categories', 'theory'

- Text: A quantum category is an opmonoidal monad on the monoidale associated to a biduality $R\dashv R^{o}$, or enveloping monoidale, in a monoidal bicategory of modules $\Mod(V})$ for a monoidal category V
- Concepts: 'quantum category', 'opmonoidal monad', 'monoidale', 'biduality', 'enveloping monoidale', 'monoidal bicategory', 'modules', 'monoidal category'

- Text: Lack and Street proved that quantum categories are in equivalence with right skew monoidales whose unit has a right adjoint in $\Mod(V)$
- Concepts: 'quantum categories', 'equivalence', 'right skew monoidales', 'unit', 'right adjoint', 'Mod(V)'

- Text: Our first important result is similar to that of Lack and Street
- Concepts: 'important result', 'Lack', 'Street'

- Text: It is a characterisation of opmonoidal arrows on enveloping monoidales in terms of a new structure named oplax action
- Concepts: 'opmonoidal', 'enveloping monoidales', 'oplax action'

- Text: We then provide three different notions of comodule for an opmonoidal arrow, and using a similar technique we prove that they are equivalent
- Concepts: 'comodule', 'opmonoidal arrow', 'equivalent'

- Text: Finally, when the opmonoidal arrow is an opmonoidal monad, we are able to provide the category of comodules for a quantum category with a monoidal structure such that the forgetful functor is monoidal.
- Concepts: 'opmonoidal arrow', 'opmonoidal monad', 'category of comodules', 'quantum category', 'monoidal structure', 'forgetful functor', 'monoidal'

- Text: We study deformation of tube algebra under twisting of graded monoidal categories
- Concepts: 'tube algebra', 'deformation', 'twisting', 'graded monoidal categories'

- Text: When a tensor category C is graded over a group $\Gammaa$, a torus-valued 3-cocycle on $\Gammaa$ can be used to deform the associator of C
- Concepts: 'tensor category', 'graded', 'group', 'torus-valued', '3-cocycle', 'deform', 'associator'

- Text: We show that it induces a 2-cocycle on the groupoid of the adjoint action of $\Gammaa$
- Concepts: 'groupoid', 'adjoint action', '2-cocycle'

- Text: Combined with the natural Fell bundle structure of tube algebra over this groupoid, we show that the tube algebra of the twisted category is a 2-cocycle twisting of the original one.
- Concepts: 'tube algebra', 'groupoid', 'twisted category', '2-cocycle twisting'

- Text: In this paper we consider a crossed product of two crossed modules of Hopf monoids in a strict symmetric monoidal category ${\mathcal C}$ and give necessary and sufficient conditions to get a new crossed module of Hopf monoids in ${\mathcal C}$
- Concepts: 'crossed product', 'crossed modules', 'Hopf monoids', 'strict symmetric monoidal category', 'new crossed module'

- Text: Moreover we introduce the notion of projection of crossed modules of Hopf monoids and show that with additional hypotheses, any of these projections defines a new crossed module of Hopf monoids and allows us to construct an example of this kind of crossed product
- Concepts: 'crossed modules', 'Hopf monoids', 'projection', 'crossed product'

- Text: Finally, we develop the explicit computations of a crossed product associated to a projection of crossed modules in groups.
- Concepts: 'crossed product', 'projection', 'crossed modules', 'groups'

- Text: Tangent categories provide an axiomatic approach to key structural aspects of differential geometry that exist not only in the classical category of smooth manifolds but also in algebraic geometry, homological algebra, computer science, and combinatorics
- Concepts: 'tangent categories', 'differential geometry', 'classical category', 'smooth manifolds', 'algebraic geometry', 'homological algebra', 'computer science', 'combinatorics'

- Text: Generalizing the notion of \textit{(linear) connection} on a smooth vector bundle, Cockett and Cruttwell have defined a notion of connection on a differential bundle in an arbitrary tangent category
- Concepts: 'linear connection', 'smooth vector bundle', 'connection', 'differential bundle', 'tangent category'

- Text: Herein, we establish equivalent formulations of this notion of connection that reduce the amount of specified structure required
- Concepts: 'notion of connection', 'specified structure'

- Text: Further, one of our equivalent formulations substantially reduces the number of axioms imposed, and others provide useful abstract conceptualizations of connections
- Concepts: 'equivalent formulations', 'axioms', 'abstract conceptualizations', 'connections'

- Text: In particular, we show that a connection on a differential bundle E over M is equivalently given by a single morphism K that induces a suitable decomposition of TE as a biproduct
- Concepts: 'differential bundle', 'connection', 'morphism', 'decomposition', 'biproduct'

- Text: We also show that a connection is equivalently given by a vertical connection K for which a certain associated diagram is a limit diagram.
- Concepts: 'vertical connection', 'limit diagram'

- Text: The Ehresmann-Schein-Nambooripad (ESN) Theorem asserts an equivalence between the category of inverse semigroups and the category of inductive groupoids
- Concepts: 'category', 'equivalence', 'inverse semigroups', 'inductive groupoids', 'ESN Theorem'

- Text: In this paper, we consider the category of inverse categories and functors - a natural generalization of inverse semigroups and semigroup homomorphisms - and extend the ESN Theorem to an equivalence between this category and the category of locally complete inductive groupoids and locally inductive functors
- Concepts: 'category', 'inverse categories', 'functors', 'generalization', 'inverse semigroups', 'semigroup homomorphisms', 'ESN theorem', 'equivalence', 'locally complete inductive groupoids', 'locally inductive functors'

- Text: From the proof of this extension, we also generalize the ESN Theorem to an equivalence between the category of inverse semicategories and the category of locally inductive groupoids and to an equivalence between the category of inverse categories with oplax functors and the category of locally complete inductive groupoids and ordered functors.
- Concepts: 'ESN Theorem', 'equivalence', 'inverse semicategories', 'locally inductive groupoids', 'inverse categories', 'op-lax functors', 'locally complete inductive groupoids', 'ordered functors'

- Text: Let H be a quasi-Hopf algebra
- Concepts: 'quasi-Hopf algebra'

- Text: We show that any H-bimodule coalgebra C for which there exists an H-bimodule coalgebra morphism n : C -> H is isomorphic to what we will call a smash product coalgebra
- Concepts: 'H-bimodule coalgebra', 'coalgebra morphism', 'smash product coalgebra'

- Text: To this end, we use an explicit monoidal equivalence between the category of two-sided two-cosided Hopf modules over H and the category of left Yetter-Drinfeld modules over H
- Concepts: 'monoidal equivalence', 'two-sided Hopf modules', 'two-cosided Hopf modules', 'left Yetter-Drinfeld modules'

- Text: This categorical method allows also to reobtain the structure theorem for a quasi-Hopf (bi)comodule algebra given by Panaite and Van Oystaeyen, and by Dello et al.
- Concepts: 'categorical method', 'structure theorem', 'quasi-Hopf', 'bi-comodule algebra'

- Text: Passive linear networks are used in a wide variety of engineering applications, but the best studied are electrical circuits made of resistors, inductors and capacitors
- Concepts: 'linear networks', 'electrical circuits', 'resistors', 'inductors', 'capacitors'

- Text: We describe a category where a morphism is a circuit of this sort with marked input and output terminals
- Concepts: 'category', 'morphism', 'circuit', 'input terminal', 'output terminal'

- Text: In this category, composition describes the process of attaching the outputs of one circuit to the inputs of another
- Concepts: 'category', 'composition', 'circuit', 'inputs', 'outputs'

- Text: We construct a functor, dubbed the `black box functor', that takes a circuit, forgets its internal structure, and remembers only its external behavior
- Concepts: 'functor', 'circuit', 'internal structure', 'external behavior'

- Text: Two circuits have the same external behavior if and only if they impose same relation between currents and potentials at their terminals
- Concepts: 'circuits', 'external behavior', 'relation', 'currents', 'potentials', 'terminals'

- Text: The space of these currents and potentials naturally has the structure of a symplectic vector space, and the relation imposed by a circuit is a Lagrangian linear relation
- Concepts: 'space', 'currents', 'potentials', 'symplectic vector space', 'circuit', 'Lagrangian linear relation'

- Text: Thus, the black box functor goes from our category of circuits to a category with Lagrangian linear relations as morphisms

- Concepts: 'functor', 'category', 'circuits', 'Lagrangian linear relations', 'morphisms'

- Text: We prove that this functor is symmetric monoidal and indeed a hypergraph functor
- Concepts: functor', 'symmetric monoidal', 'hypergraph functor'

- Text: We assume the reader is familiar with category theory, but not with circuit theory or symplectic linear algebra.
- Concepts: 'category theory', 'circuit theory', 'symplectic linear algebra'

- Text: Long before the invention of Feynman diagrams, engineers were using similar diagrams to reason about electrical circuits and more general networks containing mechanical, hydraulic, thermodynamic and chemical components
- Concepts: Feynman diagrams', 'electrical circuits', 'networks', 'mechanical components', 'hydraulic components', 'thermodynamic components', 'chemical components'

- Text: We can formalize this reasoning using props: that is, strict symmetric monoidal categories where the objects are natural numbers, with the tensor product of objects given by addition
- Concepts: 'props', 'strict symmetric monoidal categories', 'natural numbers', 'tensor product', 'addition'

- Text: In this approach, each kind of network corresponds to a prop, and each network of this kind is a morphism in that prop
- Concepts: 'approach', 'network', 'prop', 'morphisms'

- Text: A network with m inputs and n outputs is a morphism from m to n, putting networks together in series is composition, and setting them side by side is tensoring
- Concepts: 'network', 'morphism', 'inputs', 'outputs', 'composition', 'tensoring'

- Text: Here we work out the details of this approach for various kinds of electrical circuits, starting with circuits made solely of ideal perfectly conductive wires, then circuits with passive linear components, and then circuits that also have voltage and current sources
- Concepts: 'electrical circuits', 'conductivity', 'passive linear components', 'voltage sources', 'current sources'

- Text: Each kind of circuit corresponds to a mathematically natural prop
- Concepts: 'circuit', 'mathematically natural', 'prop'

- Text: We describe the `behavior' of these circuits using morphisms between props
- Concepts: 'circuits', 'morphisms', 'props'

- Text: In particular, we give a new construction of the black-boxing functor of Fong and the first author; unlike the original construction, this new one easily generalizes to circuits with nonlinear components

- Concepts: 'construction', 'black-boxing functor', 'nonlinear components', 'circuits'

- Text: We also use a morphism of props to clarify the relation between circuit diagrams and the signal-flow diagrams in control theory
- Concepts: 'morphism', 'props', 'circuit diagrams', 'signal-flow diagrams', 'control theory'

- Text: Technically, the key tools are the Rosebrugh-Sabadini-Walters result relating circuits to special commutative Frobenius monoids, the monadic adjunction between props and signatures, and a result saying which symmetric monoidal categories are equivalent to props.
- Concepts: commutative Frobenius monoids, monadic adjunction, props, signatures, symmetric monoidal categories

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- Text: Good atlases are defined for effective orbifolds, and a spark complex is constructed on each good atlas
- Concepts: 'atlases', 'effective orbifolds', 'spark complex'

- Text: It is proved that this process is 2-functorial with compatible systems playing as morphisms between good atlases, and that the spark character 2-functor factors through this 2-functor.
- Concepts: 'process', '2-functorial', 'compatible systems', 'morphisms', 'good atlases', 'spark character', 'factor'

- Text: Following the pattern of the Frobenius structure usually assigned to the 1-dimensional sphere, we investigate the Frobenius structures of spheres in all other dimensions
- Concepts: 'Frobenius structure', '1-dimensional sphere', 'spheres', 'dimensions'

- Text: Starting from dimension d=1, all the spheres are commutative Frobenius objects in categories whose arrows are (d+1)-dimensional cobordisms
- Concepts: d=1, spheres, commutative, Frobenius objects, categories, arrows, (d+1)-dimensional cobordisms

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- Text: With respect to the language of Frobenius objects, there is no distinction between these spheres - they are all free of additional equations formulated in this language
- Concepts: 'Frobenius objects', 'spheres', 'equations'

- Text: The corresponding structure makes out of the 0-dimensional sphere not a commutative but a symmetric Frobenius object
- Concepts: 0-dimensional sphere', 'commutative', 'symmetric', 'Frobenius object'

- Text: This sphere is mapped to a matrix Frobenius algebra by a 1-dimensional topological quantum field theory, which corresponds to the representation of a class of diagrammatic algebras given by Richard Brauer.

- Concepts: 'sphere', 'matrix Frobenius algebra', '1-dimensional topological quantum field theory', 'representation', 'diagrammatic algebras', 'Richard Brauer'

- Text: Let C be a category with finite colimits, and let (E, M) be a factorisation system on C with M stable under pushout
- Concepts: category', 'finite colimits', 'factorisation system', 'stable under pushout'

- Text: Writing $C;M^{\op}$ for the symmetric monoidal category with morphisms cospans of the form $\stackrel{c}\to \stackrel{m}\leftarrow$, where $c \in C$ and $m \in M$, we give a method for constructing a category from a symmetric lax monoidal functor $F : (C; \mc M^{\op},+) \to (Set,\times)$
- Concepts: 'symmetric monoidal category', 'morphisms', 'cospans', 'symmetric lax monoidal functor', 'category', 'Set', 'times'

- Text: A morphism in this category, termed a decorated corelation, comprises (i) a cospan $X \to N \leftarrow Y$ in C such that the canonical copairing $X+Y \to N$ lies in E, together with (ii) an element of FN
- Concepts: 'morphism', 'category', 'cospan', 'canonical copairing', 'element', 'decorated corelation'

- Text: Functors between decorated corelation categories can be constructed from natural transformations between the decorating functors F

- Concepts: 'functors', 'decorated correlation categories', 'natural transformations', 'decorating functors'

- Text: This provides a general method for constructing hypergraph categories - symmetric monoidal categories in which each object is a special commutative Frobenius monoid in a coherent way - and their functors
- Concepts: 'hypergraph categories', 'symmetric monoidal categories', 'commutative Frobenius monoid', 'functors'

- Text: Such categories are useful for modelling network languages, for example circuit diagrams, and such functors are useful for modelling their semantics.
- Concepts: 'categories', 'network languages', 'circuit diagrams', 'functors', 'semantics'

- Text: We associate to a 2-vector bundle over an essentially finite groupoid a 2-vector space of parallel sections, or, in representation theoretic terms, of higher invariants, which can be described as homotopy fixed points
- Concepts: '2-vector bundle', '2-vector space', 'parallel sections', 'representation theoretic', 'higher invariants', 'homotopy fixed points'

- Text: Our main result is the extension of this assignment to a symmetric monoidal 2-functor $Par : 2VecBunGrpd \to 2Vect$
- Concepts: 'symmetric monoidal 2-functor', '2VecBunGrpd', '2Vect', 'extension', 'assignment'

- Text: It is defined on the symmetric monoidal bicategory \$2VecBunGrpd\$ whose morphisms arise from spans of groupoids in such a way that the functor \$Par\$ provides pull-push maps between 2-vector spaces of parallel sections of 2-vector bundles
- Concepts: 'symmetric monoidal bicategory', '2VecBunGrpd', 'spans of groupoids', 'functor', 'pull-push maps', '2-vector spaces', 'parallel sections', '2-vector bundles'

- Text: The direct motivation for our construction comes from the orbifoldization of extended equivariant topological field theories.
- Concepts: 'construction', 'orbifoldization', 'equivariant', 'topological field theories'

- Text: The interleaving distance was originally defined in the field of Topological Data Analysis (TDA) by Chazal et al
- Concepts: 'interleaving distance', 'Topological Data Analysis', 'Chazal'

- Text: as a metric on the class of persistence modules parametrized over the real line
- Concepts: 'metric', 'persistence modules', 'real line'

- Text: Bubenik et al
- Concepts: None identified. The context does not provide any specific references to mathematical concepts or terminology.

- Text: subsequently extended the definition to categories of functors on a poset, the objects in these categories being regarded as `generalized persistence modules'

- Concepts: 'categories', 'functors', 'poset', 'generalized persistence modules'

- Text: These metrics typically depend on the choice of a lax semigroup of endomorphisms of the poset
- Concepts: 'metrics', 'lax semigroup', 'endomorphisms', 'poset'

- Text: The purpose of the present paper is to develop a more general framework for the notion of interleaving distance using the theory of `actegories'
- Concepts: 'interleaving distance', 'actegories', 'general framework', 'notion'

- Text: Specifically, we extend the notion of interleaving distance to arbitrary categories equipped with a flow, i.e
- Concepts: 'interleaving distance', 'arbitrary categories', 'flow'

- Text: a lax monoidal action by the monoid $[0,\infty)$
- Concepts: 'lax monoidal action', 'monoid'

- Text: In this way, the class of objects in such a category acquires the structure of a Lawvere metric space
- Concepts: 'category', 'Lawvere metric space'

- Text: Functors that are colax $[0,\infty)$-equivariant yield maps that are 1-Lipschitz

- Concepts: 'functors', 'colax', '[0,\infty)-equivariant', 'maps', '1-Lipschitz'

- Text: This leads to concise proofs of various known stability results from TDA, by considering appropriate colax $[0,\infty)$-equivariant functors
- Concepts: 'colax', '$[0,\infty)$-equivariant functors', 'TDA', 'stability results'

- Text: Along the way, we show that several common metrics, including the Hausdorff distance and the L^∞-norm, can be realized as interleaving distances in this general perspective.
- Concepts: 'Hausdorff distance', 'L^∞-norm', 'interleaving distances'

- Text: We introduce and compare several new exactness conditions involving what we call split cubes
- Concepts: 'exactness conditions', 'split cubes'

- Text: These conditions are motivated by their special cases, some which become familiar, in the pointed context, once we reformulate them with split cubes replaced with split extensions.
- Concepts: 'split cubes', 'split extensions'

- Text: This paper is about an invariant of small categories called \emph{isotropy}
- Concepts: 'small categories', 'invariant', 'isotropy'

- Text: Every small category C has associated with it a presheaf of groups on C, called its isotropy group, which in a sense solves the problem of making the assignment C |-> Aut(C) functorial
- Concepts: 'small category', 'presheaf of groups', 'isotropy group', 'assignment', 'functorial', 'Aut(C)'

- Text: Consequently, every category has a canonical congruence that annihilates the isotropy; however, it turns out that the resulting quotient may itself have non-trivial isotropy
- Concepts: 'category', 'congruence', 'quotient', 'isotropy'

- Text: This phenomenon, which we term higher order isotropy, is the subject of our investigation
- Concepts: 'higher order isotropy', 'investigation'

- Text: We show that with each category C we may associate a sequence of groups called its higher isotropy groups, and that these give rise to a sequence of quotients of C
- Concepts: 'category', 'groups', 'higher isotropy groups', 'quotients'

- Text: This sequence leads us to an ordinal invariant for small categories, which we call isotropy rank: the isotropy rank of a small category is the ordinal at which the sequence of quotients stabilizes
- Concepts: 'sequence', 'ordinal invariant', 'small categories', 'isotropy rank', 'sequence of quotients', 'stabilizes'

- Text: Our main results state that each small category has a well-defined isotropy rank, and moreover, that for each small ordinal one may construct a small category with precisely that rank
- Concepts: 'small category', 'isotropy rank', 'small ordinal'

- Text: It happens that isotropy rank of a small category is an instance of the same concept for Grothendieck toposes, for which corresponding statements hold
- Concepts: 'isotropy rank', 'small category', 'Grothendieck toposes', 'corresponding statements'

- Text: Most of the technical work in the paper is concerned with the development of tools that allow us to compute (higher) isotropy groups of categories in terms of those of certain suitable subcategories.
- Concepts: 'isotropy groups', 'higher isotropy groups', 'categories', 'subcategories'

- Text: In this paper we prove a stability result for inner fibrations in terms of the wide, or fat join operation on simplicial sets
- Concepts: 'simplicial sets', 'inner fibrations', 'stability result', 'wide join', 'fat join operation'

- Text: We also prove some additional results on inner anodyne morphisms that may be of independent interest.
- Concepts: 'inner anodyne morphisms'

- Text: It is well known that a relation ϕ between sets is regular if, and only if, $K\phi$ is completely distributive (cd), where $K\phi$ is the complete lattice consisting of fixed points of the Kan adjunction induced by ϕ
- Concepts: 'relation', 'sets', 'regular', 'complete distributive', 'complete lattice', 'fixed points', 'Kan adjunction'

- Text: For a small quantaloid Q, we investigate the Q-enriched version of this classical result, i.e., the regularity of Q-distributors versus the constructive complete distributivity (ccd) of Q-categories, and prove that ``the dual of $K\phi$ is (ccd) implies ϕ is regular implies $K\phi$ is (ccd)'' for any Q-distributor ϕ
- Concepts: 'quantaloid', 'Q-enriched', 'regularity', 'Q-distributors', 'constructive complete distributivity', 'Q-categories'

- Text: Although the converse implications do not hold in general, in the case that Q is a commutative integral quantale, we show that these three statements are equivalent for any ϕ if, and only if, Q is a Girard quantale.
- Concepts: commutative integral quantale, Girard quantale

- Text: We give a direct proof that between two toposes, F and E, bounded over a base topos S, adjunctions L -| R: Loc_F -> Loc_E over Loc_S are Frobenius if and only if R commutes with the double power locale monad and finite coproducts
- Concepts: 'topos', 'base topos', 'adjunctions', 'Frobenius', 'double power locale monad', 'finite coproducts'

- Text: The proof uses only certain categorical properties of the category of locales, Loc
- Concepts: 'category', 'locales', 'categorical properties'

- Text: This implies that between categories axiomatized to behave like categories of locales, it does not make a difference whether maps are defined as structure preserving adjunctions (i.e
- Concepts: categories', 'locales', 'structure preserving adjunctions'

- Text: those that commute with the double power monads) or Frobenius adjunctions.
- Concepts: double power monads', 'Frobenius adjunctions'

- Text: The formation of the "strict" span category Span(C) of a category C with pullbacks is a standard organizational tool of category theory
- Concepts: 'span category', 'strict span category', 'category theory', 'pullbacks'

- Text: Unfortunately, limits or colimits in Span(C) are not easily computed in terms of constructions in C
- Concepts: 'limits', 'colimits', 'Span(C)', 'computed', 'constructions', 'C'

- Text: This paper shows how to form the pullback in Span(C) for many, but not all, pairs of spans, given the existence of some specific so-called lax pullback complements in C of the "left legs" of at least one of the two given spans

- Concepts: 'pullback', 'Span(C)', 'pairs of spans', 'lax pullback complements'

- Text: For some types of spans we require the ambient category to be adhesive to be able to form at least a weak pullback in Span(C)
- Concepts: 'spans', 'ambient category', 'adhesive category', 'weak pullback'

- Text: The existence of all lax pullback complements in C along a given morphism is equivalent to the exponentiability of that morphism
- Concepts: 'lax pullback', 'complements', 'exponentiability', 'morphism'

- Text: Since exponentiability is a rather restrictive property of a morphism, the paper first develops a comprehensive framework of rules for individual lax pullback complement diagrams, which resembles the set of pasting and cancellation rules for pullback diagrams, including their behaviour under pullback
- Concepts: 'exponentiability', 'morphism', 'lax pullback complement', 'diagrams', 'pasting rules', 'cancellation rules', 'pullback'

- Text: We also present examples of lax pullback complements along non-exponentiable morphisms, obtained via lifting along a fibration.

- Concepts: 'lax pullback', 'complements', 'non-exponentiable', 'morphisms', 'lifting', 'fibration'

- Text: There are two main constructions in classical descent theory: the category of algebras and the descent category, which are known to be examples of weighted bilimits
- Concepts: 'classical descent theory', 'category of algebras', 'descent category', 'weighted bilimits'

- Text: We give a formal approach to descent theory, employing formal consequences of commuting properties of bilimits to prove classical and new theorems in the context of Janelidze-Tholen ``Facets of Descent II'', such as Benabou-Roubaud Theorems, a Galois Theorem, embedding results and formal ways of getting effective descent morphisms
- Concepts: 'descent theory', 'commuting properties', 'bilimits', 'classical theorems', 'new theorems', 'Janelidze-Tholen', 'Benabou-Roubaud Theorems', 'Galois Theorem', 'embedding results', 'effective descent morphisms'

- Text: In order to do this, we develop the formal part of the theory on commuting bilimits via pseudomonad theory, studying idempotent pseudomonads and proving a 2-dimensional version of the adjoint triangle theorem
- Concepts: 'commuting bilimits', 'pseudomonad theory', 'idempotent pseudomonads', '2-dimensional', 'adjoint triangle theorem'

- Text: Also, we work out the concept of pointwise pseudo-Kan extension, used as a framework to talk about bilimits, commutativity and the descent object
- Concepts: 'pointwise pseudo-Kan extension', 'bilimits', 'commutativity', 'descent object'

- Text: As a subproduct, this formal approach can be an alternative perspective/guiding template for the development of higher descent theory.
- Concepts: 'formal approach', 'alternative perspective', 'guiding template', 'higher descent theory'

- Text: Stable derivators provide an enhancement of triangulated categories as is indicated by the existence of canonical triangulations
- Concepts: 'stable derivators', 'triangulated categories', 'canonical triangulations'

- Text: In this paper we show that exact morphisms of stable derivators induce exact functors of canonical triangulations, and similarly for arbitrary natural transformations
- Concepts: 'stable derivators', 'exact morphisms', 'exact functors', 'canonical triangulations', 'natural transformations'

- Text: This 2-categorical refinement also provides a uniqueness statement concerning canonical triangulations. These results rely on a more careful study of morphisms of derivators and this study is of independent interest

- Concepts: '2-categorical', 'refinement', 'uniqueness statement', 'canonical triangulations', 'morphisms', 'derivators', 'independent interest'

- Text: We analyze the interaction of morphisms of derivators with limits, colimits, and Kan extensions, including a discussion of invariance and closure properties of the class of Kan extensions preserved by a fixed morphism.
- Concepts: 'morphisms', 'derivators', 'limits', 'colimits', 'Kan extensions', 'invariance', 'closure properties', 'fixed morphism'

- Text: This paper generalizes the normally ordered tensor product from Tate vector spaces to Tate objects over arbitrary exact categories
- Concepts: 'normally ordered tensor product', 'Tate vector spaces', 'Tate objects', 'exact categories'

- Text: We show how to lift bi-right exact monoidal structures, duality functors, and construct external Homs
- Concepts: 'bi-right exact', 'monoidal structures', 'duality functors', 'external Homs'

- Text: We list some applications: (1) Adeles of a flag can be written as ordered tensor products; (2) Intersection numbers can be interpreted via these tensor products; (3) Pontryagin duality uniquely extends to n-Tate objects in locally compact abelian groups.

- Concepts: 'Adeles', 'flag', 'ordered tensor products', 'intersection numbers', 'Pontryagin duality', 'n-Tate objects', 'locally compact abelian groups'

- Text: This paper provides three characterizations of final functors between internal groupoids in an exact category (in the sense of Barr)
- Concepts: 'final functors', 'internal groupoids', 'exact category', 'Barr'

- Text: In particular, it is proved that a functor between internal groupoids is final if and only if it is internally full and essentially surjective.
- Concepts: 'functor', 'internal groupoids', 'final', 'internally full', 'essentially surjective'

- Text: We introduce a new class of categories generalizing locally presentable ones
- Concepts: 'categories', 'locally presentable ones', 'generalizing'

- Text: The distinction does not manifest in the abelian case and, assuming Vopenka's principle, the same happens in the regular case
- Concepts: 'abelian case', 'regular case', 'Vopenka's principle'

- Text: The category of complete partial orders is the natural example of a nearly locally finitely presentable category which is not locally presentable.

- Concepts: 'category', 'complete partial orders', 'nearly locally finitely presentable category', 'locally presentable'

- Text: Brauer-Clifford groups are equivariant Brauer groups for which a Hopf algebra acts or coacts nontrivially on the base ring
- Concepts: 'Brauer-Clifford groups', 'equivariant Brauer groups', 'Hopf algebra', 'base ring'

- Text: Brauer-Clifford groups have been established previously in the category of modules for a skew group ring S#G, the category of modules for the smash product S#H over a cocommutative Hopf algebra H, and its dual category of (S,H)-Hopf modules over a commutative Hopf algebra H
- Concepts: 'Brauer-Clifford groups', 'category of modules', 'skew group ring', 'smash product', 'cocommutative Hopf algebra', 'dual category', '(S,H)-Hopf modules', 'commutative Hopf algebra'

- Text: In this article the authors introduce a Brauer-Clifford group for the category of dyslectic Hopf Yetter-Drinfel'd (S,H)-modules for an H-commutative base ring S and quantum group H
- Concepts: 'Brauer-Clifford group', 'category', 'Hopf algebra', 'Yetter-Drinfel'd module', 'commutative ring', 'quantum group'

- Text: This is the first such example in a category of modules for a quantum group, and it gives a new example of an equivariant Brauer group in a braided monoidal category.
- Concepts: 'category of modules', 'quantum group', 'equivariant Brauer group', 'braided monoidal category'

- Text: It is known since the late 1960's that the dual of the category of compact Hausdorff spaces and continuous maps is a variety - not finitary, but bounded by $\aleph_1$
- Concepts: 'category', 'compact Hausdorff spaces', 'continuous maps', 'dual', 'variety', 'finitary', '$\aleph_1$'

- Text: In this note we show that the dual of the category of partially ordered compact spaces and monotone continuous maps is an $\aleph_1$-ary quasivariety, and describe partially its algebraic theory
- Concepts: 'category', 'partially ordered', 'compact spaces', 'monotone continuous maps', 'dual', 'quasivariety', 'algebraic theory'

- Text: Based on this description, we extend these results to categories of Vietoris coalgebras and homomorphisms on ordered compact spaces
- Concepts: 'categories', 'Vietoris coalgebras', 'homomorphisms', 'ordered compact spaces'

- Text: We also characterise the $\aleph_1$-copresentable partially ordered compact spaces.
- Concepts: '$\aleph_1$', 'copresentable', 'partially ordered', 'compact spaces'

- Text: Given a 2-category A, a 2-functor $F : A \to Cat$ and a distinguished 1-subcategory $\Sigma \subset A$ containing all the objects, a σ-cone for F (with respect to Σ) is a lax cone such that the structural 2-cells corresponding to the arrows of Σ are invertible

- Concepts: '2-category', '2-functor', '1-subcategory', 'lax cone', 'structural 2-cells', 'invertible'

- Text: The conical σ-limit} is the universal (up to isomorphism) σ-cone
- Concepts: conical, σ-limit, universal, isomorphism, σ-cone

- Text: The notion of σ-limit generalizes the well known notions of pseudo and lax limit
- Concepts: σ-limit', 'pseudo limit', 'lax limit'

- Text: We consider the fundamental notion of σ-filtered pair (A, Σ) which generalizes the notion of 2-filtered 2-category
- Concepts: 'σ-filtered pair', 'generalizes', 'notion', '2-filtered', '2-category'

- Text: We give an explicit construction of σ-filtered σ-colimits of categories, a construction which allows computations with these colimits
- Concepts: σ-filtered σ-colimits, categories, computations

- Text: We then state and prove a basic exactness property of the 2-category of categories, namely, that σ-filtered

σ-colimits commute with finite weighted pseudo (or bi) limits

- Concepts: 2-category, categories, σ-filtered, σ-colimits, finite, weighted, pseudo, bi limits, exactness property

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- Text: An important corollary of this result is that a σ-filtered σ-colimit of exact category valued 2-functors is exact
- Concepts: 'σ-filtered', 'σ-colimit', 'exact category', '2-functors', 'exact'

- Text: This corollary is essential in the 2-dimensional theory of flat and pro-representable 2-functors, that we develop elsewhere.
- Concepts: 2-dimensional, flat, pro-representable, 2-functors

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- Text: We show that the regular patterns of Getzler (2009) form a 2-category biequivalent to the 2-category of substitudes of Day and Street (2003), and that the Feynman categories of Kaufmann and Ward (2013) form a 2-category biequivalent to the 2-category of coloured operads (with invertible 2-cells)
- Concepts: '2-category', 'biequivalent', 'substitudes', 'Feynman categories', 'coloured operads', 'invertible 2-cells'

- Text: These biequivalences induce equivalences between the corresponding categories of algebras
- Concepts: biequivalences, categories of algebras, equivalences

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- Text: There are three main ingredients in establishing these biequivalences
- Concepts: 'biequivalences' (no math concepts mentioned in this context)

- Text: The first is a strictification theorem (exploiting Power's General Coherence Result) which allows to reduce to the case where the structure maps are identity-on-objects functors and strict monoidal
- Concepts: 'strictification theorem', 'General Coherence Result', 'identity-on-objects functors', 'strict monoidal'

- Text: Second, we subsume the Getzler and Kaufmann-Ward hereditary axioms into the notion of Guitart exactness, a general condition ensuring compatibility between certain left Kan extensions and a given monad, in this case the free-symmetric-monoidal-category monad
- Concepts: Getzler, Kaufmann-Ward, hereditary axioms, Guitart exactness, left Kan extensions, monad, free-symmetric-monoidal-category monad

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- Text: Finally we set up a biadjunction between substitudes and what we call pinned symmetric monoidal categories, from which the results follow as a consequence of the fact that the hereditary map is precisely the counit of this biadjunction.
- Concepts: biadjunction, substitudes, pinned symmetric monoidal categories, hereditary map, counit

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- Text: We study spans of cospans in a category C and explain how to horizontally and vertically compose these
- Concepts: 'spans', 'cospans', 'category', 'horizontally compose', 'vertically compose'

- Text: When C is a topos and the legs of the spans are monic, these two forms of composition satisfy the interchange law
- Concepts: 'topos', 'legs', 'spans', 'monic', 'composition', 'interchange law'

- Text: In this case there is a bicategory of objects, cospans, and `monic-legged' spans of cospans in C
- Concepts: 'objects', 'cospans', 'spans of cospans', 'bicategory'

- Text: One motivation for this construction is an application to graph rewriting.
- Concepts: 'construction', 'application', 'graph rewriting'

- Text: We define strict and weak duality involutions on 2-categories, and prove a coherence theorem that every bicategory with a weak duality involution is biequivalent to a 2-category with a strict duality involution
- Concepts: '2-categories', 'strict duality involution', 'weak duality involution', 'bicategory', 'biequivalent', 'coherence theorem'

- Text: For this purpose we introduce "2-categories with contravariance", a sort of enhanced 2-category with a basic notion of "contravariant morphism", which can be regarded either as generalized multicategories or as enriched categories

- Concepts: '2-categories', 'contravariance', 'enhanced 2-category', 'contravariant morphism', 'generalized multicategories', 'enriched categories'

- Text: This enables a universal characterization of duality involutions using absolute weighted colimits, leading to a conceptual proof of the coherence theorem.
- Concepts: 'universal characterization', 'duality involutions', 'absolute weighted colimits', 'coherence theorem'

- Text: In this technical note, we proffer a very explicit construction of the dual cocartesian fibration of a cartesian fibration, and we show they are classified by the same functor to the ∞-category of ∞-categories.
- Concepts: 'technical note', 'dual cocartesian fibration', 'cartesian fibration', 'functor', '∞-category', '∞-categories'

- Text: In this paper, we study properties of maps between fibrant objects in model categories
- Concepts: 'properties', 'maps', 'fibrant objects', 'model categories'

- Text: We give a characterization of weak equivalences between fibrant objects
- Concepts: 'weak equivalences', 'fibrant objects', 'characterization'

- Text: If every object of a model category is fibrant, then we give a simple description of a set of generating cofibrations

- Concepts: 'model category', 'fibrant', 'generating cofibrations'

- Text: We show that to construct such a model structure it is enough to check some relatively simple conditions.
- Concepts: 'model structure'

- Text: We extend to the category of crossed modules of Leibniz algebras the notion of biderivation via the action of a Leibniz algebra
- Concepts: 'crossed module', 'Leibniz algebra', 'biderivation'

- Text: This results into a pair of Leibniz algebras which allow us to construct an object which is the actor under certain circumstances
- Concepts: 'Leibniz algebra', 'object', 'actor'

- Text: Additionally, we give a description of an action in the category of crossed modules of Leibniz algebras in terms of equations
- Concepts: 'category', 'crossed modules', 'Leibniz algebras', 'action', 'equations'

- Text: Finally, we check that, under the aforementioned conditions, the kernel of the canonical map from a crossed module to its actor coincides with the center and we introduce the notions of crossed module of inner and outer biderivations.
- Concepts: 'kernel', 'canonical map', 'crossed module', 'actor', 'center', 'inner biderivations', 'outer biderivations'

- Text: For a topos T, there is a bicategory MonicSp(Csp(T)) whose objects are those of T, morphisms are cospans in T, and 2-morphisms are isomorphism classes of monic spans of cospans in T
- Concepts: 'topos', 'bicategory', 'MonicSp', 'Csp', 'objects', 'morphisms', 'cospans', '2-morphisms', 'isomorphism classes', 'monic spans'

- Text: Using a result of Shulman, we prove that MonicSp(Csp(T)) is symmetric monoidal, and moreover, that it is compact closed in the sense of Stay
- Concepts: 'MonicSp', 'Csp', 'symmetric monoidal', 'compact closed', 'Shulman', 'Stay'

- Text: We provide an application which illustrates how to encode double pushout rewrite rules as 2-morphisms inside a compact closed sub-bicategory of MonicSp(Csp(Graph)).
- Concepts: 'double pushout rewrite rules', '2-morphisms', 'compact closed sub-bicategory', 'MonicSp', 'Graph'

- Text: Given a set Σ of morphisms in a category C, we construct a functor F which sends elements of Σ to split monomorphisms
- Concepts: 'set', 'morphisms', 'category', 'functor', 'elements', 'split monomorphisms'

- Text: Moreover, we prove that F is weakly universal with that property when considered in the world of locally posetal

2-categories
- Concepts: 'weakly universal', 'locally posetal 2-categories'

- Text: Besides, we also use locally posetal 2-categories in order to construct weak left adjoints to those functors for which any object in the codomain admits a weak reflection
- Concepts: 'locally posetal 2-categories', 'weak left adjoints', 'functors', 'object', 'codomain', 'weak reflection'

- Text: We then apply these two results in order to restate the Injective Subcategory Problem for Σ into the existence of some kind of weak right adjoint for F.
- Concepts: 'Injective subcategory problem', 'Σ', 'weak right adjoint', 'F'

- Text: From the interpretation of Linear Logic multiplicative disjunction as the epsilon product defined by Laurent Schwartz, we construct several models of Differential Linear Logic based on the usual mathematical notions of smooth maps
- Concepts: 'Linear Logic', 'multiplicative disjunction', 'epsilon product', 'Laurent Schwartz', 'Differential Linear Logic', 'mathematical notions', 'smooth maps'

- Text: This improves on previous results by Blute, Ehrhard and Tasson based on convenient smoothness where only intuitionist models were built
- Concepts: 'convenient smoothness', 'intuitionist models'

- Text: We isolate a completeness condition, called k-quasi-completeness, and an associated notion which is stable under duality called k-reflexivity, allowing for a star-autonomous category of k-reflexive spaces in which the dual of the tensor product is the reflexive version of the epsilon-product
- Concepts: 'completeness condition', 'k-quasi-completeness', 'associated notion', 'duality', 'k-reflexivity', 'star-autonomous category', 'reflexive spaces', 'tensor product', 'epsilon-product'

- Text: We adapt Meise's definition of smooth maps into a first model of Differential Linear Logic, made of k-reflexive spaces
- Concepts: 'Differential Linear Logic', 'smooth maps', 'k-reflexive spaces'

- Text: We also build two new models of Linear Logic with conveniently smooth maps, on categories made respectively of Mackey-complete Schwartz spaces and Mackey-complete Nuclear Spaces (with extra reflexivity conditions)
- Concepts: 'Linear Logic', 'Mackey-complete Schwartz spaces', 'Mackey-complete Nuclear Spaces', 'smooth maps', 'categories', 'reflexivity conditions'

- Text: Varying slightly the notion of smoothness, one also recovers models of DiLL on the same star-autonomous categories
- Concepts: 'smoothness', 'models of DiLL', 'star-autonomous categories'

- Text: Throughout the article, we work within the setting of Dialogue categories where the tensor product is exactly the epsilon-product (without reflexivization).
- Concepts: 'Dialogue categories', 'tensor product', 'epsilon-product', 'reflexivization'

- Text: In a recent paper (2018), D
- Concepts: None, the context is incomplete and does not provide any information related to math concepts.

- Text: Hofmann, R
- Concepts: None - there are no math concepts mentioned in this context.

- Text: Neves and P
- Concepts: None given as there is no additional information in the context to extract any relevant math concepts

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- Text: Nora proved that the dual of the category of compact ordered spaces and monotone continuous maps is a quasi-variety -not finitary, but bounded by $\aleph_1$
- Concepts: category, compact ordered spaces, monotone continuous maps, dual, quasi-variety, finitary, bounded, $\aleph_1$

- Text: An open question was: is it also a variety? We show that the answer is affirmative
- Concepts: 'variety'

- Text: We describe the variety by means of a set of finitary operations, together with an operation of countably infinite arity, and equational axioms
- Concepts: 'variety', 'finitary operations', 'countably infinite arity', 'equational axioms'

- Text: The dual equivalence is induced by the dualizing object [0,1].
- Concepts: dual equivalence', 'dualizing object'

- Text: In this paper, we investigate the property (P) that binary products commute with arbitrary coequalizers in pointed categories
- Concepts: 'property (P)', 'binary products', 'commute', 'arbitrary coequalizers', 'pointed categories'

- Text: Examples of such categories include any regular unital or (pointed) majority category with coequalizers, as well as any pointed factor permutable category with coequalizers
- Concepts: regular category, unital category, pointed category, majority category, coequalizers, factor permutable category

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- Text: We establish a Mal'tsev term condition characterizing pointed varieties of universal algebras satisfying (P)
- Concepts: 'Mal'tsev term condition', 'pointed varieties', 'universal algebras', '(P)'

- Text: We then consider categories satisfying (P) locally, i.e., those categories for which every fibre of the fibration of points satisfies (P)
- Concepts: 'categories', 'fibre', 'fibration', 'points'

- Text: Examples include any regular Mal'tsev or majority category with coequalizers, as well as any regular Gumm category with coequalizers
- Concepts: 'Mal\'tsev category', 'majority category', 'coequalizers', 'regular Gumm category'

- Text: Varieties satisfying (P) locally are also characterized by a Mal'tsev term condition, which turns out to be equivalent to a variant of Gumm's shifting lemma
- Concepts: 'varieties', '(P)', 'Mal\'tsev term condition', 'Gumm\'s shifting lemma', 'equivalent'

- Text: Furthermore, we show that the varieties satisfying (P) locally are precisely the varieties with normal local projections in the sense of Z
- Concepts: 'varieties', '(P)', 'normal local projections', 'sense of Z'

- Text: Janelidze.
- Concepts: There are no specific math concepts mentioned in this context. Janelidze appears to be a proper noun or surname.

- Text: Universal algebra uniformly captures various algebraic structures, by expressing them as equational theories or abstract clones

- Concepts: 'universal algebra', 'algebraic structures', 'equational theories', 'abstract clones'

- Text: The ubiquity of algebraic structures in mathematics and related fields has given rise to several variants of universal algebra, such as theories of symmetric operads, non-symmetric operads, generalised operads, PROPs, PROs, and monads
- Concepts: 'algebraic structures', 'universal algebra', 'symmetric operads', 'non-symmetric operads', 'generalized operads', 'PROPs', 'PROs', 'monads'

- Text: These variants of universal algebra are called {notions of algebraic theory}
- Concepts: 'universal algebra', 'notions of algebraic theory'

- Text: In this paper, we develop a unified framework for them
- Concepts: unified framework'

- Text: The key observation is that each notion of algebraic theory can be identified with a monoidal category, in such a way that algebraic theories correspond to monoid objects therein
- Concepts: 'algebraic theory', 'monoidal category', 'monoid objects'

- Text: To incorporate semantics, we introduce a categorical structure called {metamodel}, which formalises a definition of models of algebraic theories

- Concepts: 'categorical structure', 'metamodel', 'semantics', 'algebraic theories', 'models'

- Text: We also define morphisms between notions of algebraic theory, which are a monoidal version of profunctors
- Concepts: 'morphisms', 'algebraic theory', 'monoidal', 'profunctors'

- Text: Every strong monoidal functor gives rise to an adjoint pair of such morphisms, and provides a uniform method to establish isomorphisms between categories of models in different notions of algebraic theory
- Concepts: 'strong monoidal functor', 'adjoint pair', 'morphisms', 'isomorphisms', 'categories', 'models', 'algebraic theory'

- Text: A general structure-semantics adjointness result and a double categorical universal property of categories of models are also shown.
- Concepts: 'structure-semantics adjointness', 'double categorical', 'universal property', 'categories of models'

- Text: This is the first part of a two paper series studying free globularly generated double categories
- Concepts: 'free', 'globular', 'generated', 'double categories'

- Text: In this first installment we introduce the free globularly generated double category construction

- Concepts: 'globularly generated', 'double category', 'free construction'

- Text: The free globularly generated double category construction canonically associates to every bicategory together with a possible category of vertical morphisms, a double category fixing this set of initial data in a free and minimal way
- Concepts: 'globularly generated', 'double category', 'bicategory', 'vertical morphisms', 'free construction', 'minimal'

- Text: We use the free globularly generated double category to study length, free products, and problems of internalization
- Concepts: 'free globularly generated double category', 'length', 'free products', 'internalization'

- Text: We use the free globularly generated double category construction to provide formal functorial extensions of the Haagerup standard form construction and the Connes fusion operation to inclusions of factors of not-necessarily finite Jones index.
- Concepts: 'globularly generated', 'double category', 'formal functorial extensions', 'Haagerup standard form construction', 'Connes fusion operation', 'inclusions', 'factors', 'Jones index'

- Text: By the Three Graces we refer, following J.-L
- Concepts: None of the given words denote Math concepts. The context seems to be referencing something else entirely.

- Text: Loday, to the algebraic operads Ass, Com, and Lie, each generated by a single binary operation; algebras over these operads are respectively associative, commutative associative, and Lie
- Concepts: 'algebraic operads', 'Ass', 'Com', 'Lie', 'binary operation', 'associative', 'commutative associative', 'Lie'

- Text: We classify all distributive laws (in the categorical sense of Beck) between these three operads
- Concepts: 'distributive laws', 'categorical sense', 'operads'

- Text: Some of our results depend on the computer algebra system Maple, especially its packages LinearAlgebra and Groebner.
- Concepts: 'computer algebra system', 'Maple', 'LinearAlgebra', 'Groebner', 'packages'

- Text: The Noether Isomorphism Theorems and the Zassenhaus Lemma from group theory have a non-pointed version in a suitable categorical context first considered by W
- Concepts: 'Noether Isomorphism Theorems', 'Zassenhaus Lemma', 'group theory', 'categorical context'

- Text: Tholen in his PhD thesis
- Concepts: 'Tholen', 'PhD thesis' (there are no significant Math concepts mentioned in this context)

- Text: This article leads to a unification of these results with the ones in the pointed categorical context previously considered by O.~Wyler, by working in the framework of \emph{star-regular} categories introduced by M.~Gran, Z.~Janelidze and A.~Ursini
- Concepts: 'categorical', 'star-regular categories'

- Text: Some concrete examples of categories where these results hold are examined in detail.
- Concepts: 'categories'

- Text: For finitary regular monads T on locally finitely presentable categories we characterize the finitely presentable objects in the category of T-algebras in the style known from general algebra: they are precisely the algebras presentable by finitely many generators and finitely many relations.
- Concepts: monads, locally finitely presentable categories, finitely presentable objects, T-algebras, generators, relations

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- Text: By theorems of Carlson and Renaudin, the theory of (∞,1)-categories embeds in that of prederivators
- Concepts: '∞-categories', 'prederivators', 'embeds'

- Text: The purpose of this paper is to give a two-fold answer to the inverse problem: understanding which prederivators model (∞,1)-categories, either strictly or in a homotopical sense
- Concepts: 'prederivators', '∞,1-categories', 'homotopical sense'

- Text: First, we characterize which prederivators arise on the nose as prederivators associated to quasicategories
- Concepts: 'prederivators', 'quasicategories', 'associated prederivators'

- Text: Next, we put a model structure on the category of prederivators and strict natural transformations, and prove a Quillen equivalence with the Joyal model structure for quasicategories.
- Concepts: 'model structure', 'category', 'prederivators', 'strict natural transformations', 'Quillen equivalence', 'Joyal model structure', 'quasicategories'

- Text: The category of 1-cat groups, which is equivalent to the category of crossed modules, has internal object actions which are representable (by internal automorphism groups)
- Concepts: 'category', '1-cat groups', 'crossed modules', 'internal object actions', 'representable', 'internal automorphism groups'

- Text: Moreover, it is known that the crossed module, corresponding to the representing object [X] = Aut(X) $ associated with a 1-cat group X, must be isomorphic to the Norrie actor of the crossed module corresponding to X
- Concepts: '1-cat group', 'representing object', 'crossed module', 'isomorphic', 'Norrie actor'

- Text: We recall the description of Aut(X) from the author's PhD thesis, and construct that isomorphism explicitly.

- Concepts: 'Aut(X)', 'isomorphism', 'PhD thesis'

- Text: A simple criterion for a functor to be finitary is presented: we call F finitely bounded if for all objects X every finitely generated subobject of FX factorizes through the F-image of a finitely generated subobject of X
- Concepts: 'functor', 'finitary', 'finely generated subobject', 'F-image', 'factorizes', 'finitely bounded', 'object'

- Text: This is equivalent to F being finitary for all functors between `reasonable' locally finitely presentable categories, provided that F preserves monomorphisms
- Concepts: 'finitary', 'functor', 'locally finitely presentable', 'preserves monomorphisms'

- Text: We also discuss the question when that last assumption can be dropped
- Concepts: question', 'assumption'

- Text: The answer is affirmative for functors between categories such as Set, K-Vec (vector spaces), boolean algebras, and actions of any finite group either on Set or on K-Vec for fields K of characteristic 0. All this generalizes to locally λ-presentable categories, λ-accessible functors and λ-presentable algebras
- Concepts: functors, categories, Set, K-Vec, vector spaces, boolean algebras, finite group, locally presentable categories, accessible functors, presentable algebras

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- Text: As an application we obtain an easy proof that the Hausdorff functor on the category of complete metric spaces is $\aleph_1$-accessible.
- Concepts: 'Hausdorff functor', 'category', 'complete metric space', '$\aleph_1$-accessible'

- Text: Higher categorical structures are often defined by induction on dimension, which a priori produces only finite-dimensional structures
- Concepts: 'higher categorical structures', 'induction on dimension', 'finite-dimensional structures'

- Text: In this paper we show how to extend such definitions to infinite dimensions using the theory of terminal coalgebras, and we apply this method to Trimble's notion of weak n-category
- Concepts: 'infinite dimensions', 'theory of terminal coalgebras', 'Trimble's notion', 'weak n-category'

- Text: Trimble's definition makes explicit the relationship between n-categories and topological spaces; our extended theory produces a definition of Trimble ∞-category and a fundamental ∞-groupoid construction. Furthermore, terminal coalgebras are often constructed as limits of a certain type
- Concepts: 'n-categories', 'topological spaces', 'extended theory', 'Trimble ∞-category', 'fundamental ∞-groupoid construction', 'terminal coalgebras', 'limits'

- Text: We prove that the theory of Batanin - Leinster weak ∞-categories arises as just such a limit, justifying our approach to Trimble ∞-categories
- Concepts: 'Batanin-Leinster', 'weak infinity-categories', 'limit', 'Trimble infinity-categories'

- Text: In fact we work at the level of monads for ∞-categories, rather than ∞-categories themselves; this requires more sophisticated technology but also provides a more complete theory of the structures in question.
- Concepts: 'monads', '∞-categories', 'sophisticated technology', 'structures'

- Text: This paper studies the homotopy theory of parametrized spectrum objects in a model category from a global point of view
- Concepts: 'homotopy theory', 'parametrized spectrum objects', 'model category', 'global point of view'

- Text: More precisely, for a model category M satisfying suitable conditions, we construct a map of model categories $TM \to M$, called the tangent bundle, whose fiber over an object in M is a model category for spectra in its over-category
- Concepts: 'model category', 'suitable conditions', 'map of model categories', 'tangent bundle', 'fiber', 'object', 'spectra', 'over-category'

- Text: We show that the tangent bundle is a relative model category and presents the ∞-categorical tangent bundle, as constructed by Lurie

- Concepts: 'tangent bundle', 'relative model category', '∞-categorical', 'Lurie'

- Text: Moreover, the tangent bundle TM inherits an enriched model structure from M
- Concepts: 'tangent bundle', 'model structure'

- Text: This additional structure is used in subsequent work to identify the tangent bundles of algebras over an operad and of enriched categories, but may be of independent interest.
- Concepts: 'tangent bundles', 'algebras over an operad', 'enriched categories'

- Text: An extensive category can be defined as a category C with finite coproducts such that for each pair X,Y of objects in C, the canonical functor $+ : C/X \times C/Y \to C/(X + Y)$ is an equivalence
- Concepts: 'extensive category', 'category', 'finite coproducts', 'functor', 'equivalence'

- Text: We say that a category C with finite products is left coextensive if the dual canonical functor $\times : X/C \times Y/C \to (X \times Y)/C$ is fully faithful
- Concepts: 'category', 'finite products', 'left coextensive', 'dual canonical functor', 'fully faithful'

- Text: We then give a syntactical characterization of left coextensive varieties of universal algebras.
- Concepts: 'syntactical characterization', 'left coextensive', 'varieties', 'universal algebras'

- Text: We say a set-valued functor on a category is nearly representable if it is a quotient of a representable functor by a group of automorphisms
- Concepts: set-valued functor, representable functor, quotient, automorphisms

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- Text: A distributor is a set-valued functor in two arguments, contravariant in one argument and covariant in the other
- Concepts: distributor', 'set-valued functor', 'arguments', 'contravariant', 'covariant'

- Text: We say a distributor is slicewise nearly representable if it is nearly representable in either of the arguments whenever the other argument is fixed
- Concepts: distributor', 'nearly representable', 'fixed', 'arguments'

- Text: We consider such a distributor a weak analogue of adjunction
- Concepts: 'weak analogue', 'adjunction'

- Text: Under a finiteness assumption on the domain categories, we show that every slicewise nearly representable functor is a composite of two distributors, each of which may be considered as a weak analogue of (co-)reflective adjunction.

- Concepts: finiteness assumption, slicewise nearly representable functor, composite, distributor, weak analogue, (co-)reflective adjunction

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- Text: Noetherian forms provide an abstract self-dual context in which one can establish homomorphism theorems (Noether isomorphism theorems and homological diagram lemmas) for groups, rings, modules and other group-like structures
- Concepts: 'Noetherian forms', 'abstract self-dual context', 'homomorphism theorems', 'Noether isomorphism theorems', 'homological diagram lemmas', 'groups', 'rings', 'modules', 'group-like structures'

- Text: In fact, any semi-abelian category in the sense of G
- Concepts: 'semi-abelian category'

- Text: Janelidze, L
- Concepts: No math concepts are present in this context. Additional information is needed to identify which Janelidze or L is being referred to.

- Text: M\arki and W
- Concepts: None - the context does not contain any words denoting math concepts.

- Text: Tholen, as well as any exact category in the sense of M
- Concepts: 'exact category'

- Text: Grandis (and hence, in particular, any abelian category), can be seen as an example of a noetherian form
- Concepts: 'noetherian form', 'abelian category'

- Text: In this paper we generalize the notion of a biproduct of objects in an abelian category to a noetherian form and apply it do develop commutator theory in noetherian forms
- Concepts: 'biproduct', 'objects', 'abelian category', 'noetherian form', 'commutator theory'

- Text: In the case of semi-abelian categories, biproducts give usual products of objects and our commutators coincide with the so-called Huq commutators (which in the case of groups are the usual commutators of subgroups)
- Concepts: 'semi-abelian categories', 'biproducts', 'usual products', 'commutators', 'Huq commutators', 'groups', 'usual commutators', 'subgroups'

- Text: This paper thus shows that the structure of a noetherian form allows for a self-dual approach to products and commutators in semi-abelian categories, similarly as has been known for homomorphism theorems.
- Concepts: 'noetherian form', 'self-dual approach', 'products', 'commutators', 'semi-abelian categories', 'homomorphism theorems'

- Text: Poly-bicategories generalise planar polycategories in the same way as bicategories generalise monoidal categories

- Concepts: 'Poly-bicategories', 'planar polycategories', 'bicategories', 'monoidal categories'

- Text: In a poly-bicategory, the existence of enough 2-cells satisfying certain universal properties (representability) induces coherent algebraic structure on the 2-graph of single-input, single-output 2-cells
- Concepts: 'poly-bicategory', '2-cells', 'universal properties', 'representability', 'coherent algebraic structure', '2-graph'

- Text: A special case of this theory was used by Hermida to produce a proof of strictification for bicategories
- Concepts: 'special case', 'theory', 'proof', 'strictification', 'bicategories'

- Text: No full strictification is possible for higher-dimensional categories, seemingly due to problems with 2-cells that have degenerate boundaries; it was conjectured by C
- Concepts: 'higher-dimensional categories', 'strictification', '2-cells', 'degenerate boundaries', 'conjectured'

- Text: Simpson that semi-strictification excluding units may be possible. We study poly-bicategories where 2-cells with degenerate boundaries are barred, and show that we can recover the structure of a bicategory through a different construction of weak units
- Concepts: 'Simpson', 'semi-strictification', 'poly-bicategories', '2-cells', 'bicategory', 'weak units'

- Text: We prove that the existence of these units is equivalent to the existence of 1-cells satisfying lower-dimensional universal properties, and study the relation between preservation of units and universal cells. Then, we introduce merge-bicategories, a variant of poly-bicategories with more composition operations, which admits a natural monoidal closed structure, giving access to higher morphisms
- Concepts: 1-cells, universal properties, preservation, merge-bicategories, poly-bicategories, composition operations, monoidal closed structure, higher morphisms

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- Text: We derive equivalences between morphisms, transformations, and modifications of representable merge-bicategories and the corresponding notions for bicategories
- Concepts: 'morphisms', 'transformations', 'modifications', 'representable', 'merge-bicategories', 'bicategories'

- Text: Finally, we prove a semi-strictification theorem for representable merge-bicategories with a choice of composites and units.
- Concepts: 'representable', 'merge-bicategories', 'composites', 'units', 'semi-strictification theorem'

- Text: We construct model category structures on various types of (marked) *-categories
- Concepts: 'model category', 'marked category', '*-category'

- Text: These structures are used to present the infinity categories of (marked) *-categories obtained by inverting (marked) unitary equivalences
- Concepts: infinity categories', 'marked categories', '*-categories', 'unitary equivalences', 'inverting'

- Text: We use this presentation to explicitly calculate the ∞-categorical G-fixed points and G-orbits for G-equivariant (marked) *-categories.
- Concepts: 'infinity-categorical', 'G-fixed points', 'G-orbits', 'G-equivariant', '*-categories'

- Text: We construct a generalization of the operadic nerve, providing a translation between the equivariant simplicially enriched operadic world to the parametrized ∞-categorical perspective
- Concepts: 'generlization', 'operadic nerve', 'equivariant', 'simplicially enriched', 'operadic', 'parametrized', '∞-categorical'

- Text: This naturally factors through genuine equivariant operads, a model for ``equivariant operads with norms up to homotopy''
- Concepts: 'genuine equivariant operads', 'equivariant operads', 'norms up to homotopy', 'model'

- Text: We introduce the notion of an op-fibration of genuine equivariant operads, extending Grothendieck op-fibrations, and characterize fibrant operads as the image of genuine equivariant symmetric monoidal categories

- Concepts: equivariant operads', 'Grothendieck op-fibrations', 'fibrant operads', 'equivariant symmetric monoidal categories'

- Text: Moreover, we show that under the operadic nerve, this image is sent to G-symmetric monoidal G-∞-categories
- Concepts: 'operadic nerve', 'G-symmetric', 'monoidal', 'G-∞-categories'

- Text: Finally, we produce a functor comparing the notion of algebra over an operad in each of these two contexts.
- Concepts: 'functor', 'algebra', 'operad'

- Text: Let E be a topos
- Concepts: 'topos'

- Text: If l is a level of E with monic skeleta then it makes sense to consider the objects in E that have l-skeletal boundaries
- Concepts: 'level', 'monic skeleta', 'objects', 'skeletal boundaries'

- Text: In particular, if p : E \to S is a pre-cohesive geometric morphism then its centre (that may be called level 0) has monic skeleta
- Concepts: 'pre-cohesive geometric morphism', 'centre', 'level 0', 'monic skeleta'

- Text: Let level 1 be the Aufhebung of level 0
- Concepts: 'level 1', 'Aufhebung', 'level 0'

- Text: We show that if level 1 has monic skeleta then the quotients of 0-separated objects with 0-skeletal boundaries are 1-skeletal
- Concepts: 'monic skeleta', '0-separated objects', '0-skeletal boundaries', '1-skeletal'

- Text: We also prove that in several examples (such as the classifier of non-trivial Boolean algebras, simplicial sets and the classifier of strictly bipointed objects) every 1-skeletal object is of that form.
- Concepts: 'Boolean algebras', 'simplicial sets', 'bipointed objects', '1-skeletal object'

- Text: In this work we define a 2-dimensional analogue of extranatural transformation and use these to characterise codescent objects
- Concepts: '2-dimensional', 'extranatural transformation', 'codescent objects'

- Text: They will be seen as universal objects amongst pseudo-extranatural transformations in a similar manner in which coends are universal objects amongst extranatural transformations
- Concepts: 'universal objects', 'pseudo-extranatural transformations', 'coends', 'extranatural transformations'

- Text: Some composition lemmas concerning these transformations are introduced and a Fubini theorem for codescent objects is proven using the universal characterisation description.

- Concepts: 'composition lemmas', 'transformations', 'Fubini theorem', 'codescent objects', 'universal characterisation description'

- Text: Given 2-categories C and D, let Lax (C,D) denote the 2-category of lax functors, lax natural transformations and modifications, and [C,D]_lnt its full sub-2-category of (strict) 2-functors
- Concepts: 2-category', 'lax functors', 'lax natural transformations', 'modifications', 'strict 2-functors'

- Text: We give two isomorphic constructions of a 2-category C \boxtimes D satisfying Lax (C, Lax(D,E)) \cong [C \boxtimes D, E}_lnt, hence generalising the case of the free distributive law 1 \boxtimes 1
- Concepts: '2-category', 'isomorphic constructions', 'Lax', 'distributive law'

- Text: We also discuss dual constructions.
- Concepts: dual constructions'

- Text: A Lie 2-group G is a category internal to the category of Lie groups
- Concepts: 'Lie 2-group', 'category', 'internal', 'category of Lie groups'

- Text: Consequently it is a monoidal category and a Lie groupoid
- Concepts: monoidal category', 'Lie groupoid'

- Text: The Lie groupoid structure on G gives rise to the Lie 2-algebra X(G) of multiplicative vector fields
- Concepts: Lie groupoid', 'Lie 2-algebra', 'multiplicative vector fields'

- Text: The monoidal structure on G gives rise to a left action of the 2-group G on the Lie groupoid G, hence to an action of G on the Lie 2-algebra X(G)
- Concepts: 'monoidal structure', 'left action', '2-group', 'Lie groupoid', 'Lie 2-algebra'

- Text: As a result we get the Lie 2-algebra X(G)^G of left-invariant multiplicative vector fields. On the other hand there is a well-known construction that associates a Lie 2-algebra g to a Lie 2-group G: apply the functor Lie : LieGp -> LieAlg to the structure maps of the category G
- Concepts: Lieber group, Lie algebra, multiplicative vector fields, Lie 2-algebra, left-invariant, structure maps, category G

- Text: We show that the Lie 2-algebra g is isomorphic to the Lie 2-algebra X(G)^G of left invariant multiplicative vector fields.
- Concepts: 'Lie 2-algebra', 'isomorphic', 'left invariant', 'multiplicative vector fields'

- Text: This paper studies a category X with an endofunctor T : X \to X
- Concepts: 'category', 'endofunctor'

- Text: A T-algebra is given by a morphism Tx \to x in X
- Concepts: 'T-algebra', 'morphism', 'X'

- Text: We examine the related questions of when T freely generates a triple (or monad) on X; when an object x in X freely generates a T-algebra; and when the category of T-algebras has coequalizers and other colimits
- Concepts: triple, monad, object, T-algebra, category, coequalizers, colimits

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- Text: The paper defines a category of ``T-horns'' which effectively contains X as well as all T-algebras
- Concepts: 'category', 'T-horns', 'T-algebras'

- Text: It is assume that Xs is cocomplete and has a factorization system (E,M) satisfying reasonable properties
- Concepts: 'cocomplete', 'factorization system'

- Text: An ordinal-indexed sequence of T-horns is then defined which provides successive approximations to a free T-algebra generated by an object x in X, as well as approximations to coequalizers and other colimits for the category of T-algebras
- Concepts: ordinal-indexed sequence', 'T-horns', 'free T-algebra', 'object x', 'coequalizers', 'colimits', 'category of T-algebras'

- Text: Using the notions of an M-cone and a separated T-horn it is shown that if X is M-well-powered, then the ordinal sequence stabilizes at the desired free algebra or coequalizer or other colimit whenever they exist
- Concepts: M-cone', 'separated T-horn', 'M-well-powered', 'ordinal sequence', 'free algebra', 'coequalizer', 'colimit'

- Text: This paper is a successor to a paper written by the first author in 1970 that showed that T generates a free triple when every x in X generates a free T-algebra
- Concepts: 'T', 'free triple', 'X', 'free T-algebra'

- Text: We also consider colimits in triple algebras and give some examples of functors T for which no x in X generates a free T-algebra.
- Concepts: 'triple algebras', 'colimits', 'functors', 'T-algebra', 'free T-algebra'

- Text: We unify previous constructions from our work on concurrent game semantics into a single categorical framework
- Concepts: 'concurrent game semantics', 'categorical framework'

- Text: From an operational description of positions and moves in some game, called a \emph{signature}, we produce a pseudo double category, in which objects are positions and vertical morphisms are plays
- Concepts: 'pseudo double category', 'positions', 'moves', 'signature', 'vertical morphisms', 'plays'

- Text: The considered games are multi-player, so it makes sense to consider embeddings of positions: these are the horizontal morphisms
- Concepts: 'multi-player games', 'embeddings of positions', 'horizontal morphisms'

- Text: Finally, cells may be thought of as embeddings of plays preserving initial and final positions
- Concepts: 'cells', 'embeddings', 'plays', 'initial positions', 'final positions'

- Text: In order to be suitable for game semantics, the obtained pseudo double category should enjoy a certain fibredness property
- Concepts: 'pseudo double category', 'fibredness property', 'game semantics'

- Text: Under suitable hypotheses, we show that our construction actually produces such a \emph{fibred} pseudo double category, from which we can define relevant categories of plays, and thus of strategies
- Concepts: 'construction', 'fibred', 'pseudo double category', 'categories', 'plays', 'strategies'

- Text: We give a first necessary and sufficient criterion for this to hold and then a sufficient criterion that can be checked more easily.
- Concepts: 'necessary criterion', 'sufficient criterion', 'check'

- Text: Having given a characterization of the categorical congruence modularity getting rid of the assumption that the ground category is regular, we give now a characterization of the categorical congruence distributivity
- Concepts: 'categorical congruence', 'modularity', 'ground category', 'regular', 'distributivity'

- Text: We have a look as well at the case where the congruence distributivity is only involved, in some sense, for a subclass Γ of equivalence relations.
- Concepts: 'congruence', 'distributivity', 'subclass', 'equivalence relations'

- Text: We study properties of a category after quotienting out a suitable chosen group of isomorphisms on each object
- Concepts: 'category', 'quotienting', 'group of isomorphisms', 'object'

- Text: Coproducts in the original category are described in its quotient by our new weaker notion of a `phased coproduct'
- Concepts: 'coproducts', 'original category', 'quotient', 'weaker notion', 'phased coproduct'

- Text: We examine these and show that any suitable category with them arises as such a quotient of a category with coproducts
- Concepts: 'category', 'coproducts', 'quotient'

- Text: Motivation comes from projective geometry, and also quantum theory where they describe superpositions in the category of Hilbert spaces and continuous linear maps up to global phase
- Concepts: 'projective geometry', 'quantum theory', 'category', 'Hilbert spaces', 'continuous linear maps', 'global phase'

- Text: The quotients we consider also generalise those induced by categorical isotropy in the sense of Funk et al.
- Concepts: 'quotients', 'categorical isotropy'

- Text: We develop a notion of limit for dagger categories, that we show is suitable in the following ways: it subsumes special cases known from the literature; dagger limits are unique up to unitary isomorphism; a wide class of dagger limits can be built from a small selection of them; dagger limits of a fixed shape can be phrased as dagger adjoints to a diagonal functor; dagger limits can be built from ordinary limits in the presence of polar decomposition; dagger limits commute with dagger colimits in many cases.
- Concepts: 'limit', 'dagger categories', 'dagger limits', 'unitary isomorphism', 'diagonal functor', 'polar decomposition', 'dagger colimits'

- Text: If C is a monoidal category with reflexive coequalizers which are preserved by tensoring from both sides, then the category MonC of monoids over C has all coequalizers and these are regular epimorphisms in C

- Concepts: 'monoidal category', 'reflexive coequalizers', 'tensoring', 'monoids', 'MonC', 'coequalizers', 'regular epimorphisms'

- Text: This implies that MonC has all colimits which exist in C, provided that C in addition has (regular epi, jointly monomorphic)-factorizations of discrete cones and admits arbitrary free monoids
- Concepts: colimits, regular epi, jointly monomorphic, factorizations, free monoids

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- Text: A further application is a lifting theorem for adjunctions with a monoidal right adjoint whose left adjoint is not necessarily strong to adjunctions between the respective categories of monoids.
- Concepts: 'lifting theorem', 'adjunctions', 'monoidal right adjoint', 'left adjoint', 'strong to adjunctions', 'categories of monoids'

- Text: Van den Bergh has defined the blowup of a noncommutative surface at a point lying on a commutative divisor
- Concepts: 'blowup', 'noncommutative surface', 'point', 'commutative divisor'

- Text: We study one aspect of the construction, with an eventual aim of defining more general kinds of noncommutative blowups
- Concepts: 'construction', 'noncommutative', 'blowups'

- Text: Our basic object of study is a quasi-scheme X (a Grothendieck category)
- Concepts: 'quasi-scheme', 'Grothendieck category'

- Text: Given a closed subcategory Z, in order to define a blowup of X along Z one first needs to have a functor F_Z which is an analog of tensoring with the defining ideal of Z
- Concepts: 'closed subcategory', 'blowup', 'functor', 'tensoring', 'defining ideal'

- Text: Following Van den Bergh, a closed subcategory Z which has such a functor is called well-closed
- Concepts: closed subcategory, functor, well-closed

- Text: We show that well-closedness can be characterized by the existence of certain projective effacements for each object of X, and that the needed functor F_Z has an explicit description in terms of such effacements
- Concepts: 'well-closedness', 'projective effacements', 'functor', 'explicit description'

- Text: As an application, we prove that closed points are well-closed in quite general quasi-schemes.
- Concepts: 'closed points', 'well-closed', 'quasi-schemes'

- Text: We continue the program of structural differential geometry that begins with the notion of a tangent category, an axiomatization of structural aspects of the tangent functor on the

category of smooth manifolds
- Concepts: 'structural differential geometry', 'tangent category', 'axiomatization', 'structural aspects', 'tangent functor', 'smooth manifolds'

- Text: In classical geometry, having an affine structure on a manifold is equivalent to having a flat torsion-free connection on its tangent bundle
- Concepts: 'affine structure', 'manifold', 'flat torsion-free connection', 'tangent bundle'

- Text: This equivalence allows us to define a category of affine objects associated to a tangent category and we show that the resulting category is also a tangent category, as are several related categories
- Concepts: 'equivalence', 'category', 'affine objects', 'tangent category', 'related categories'

- Text: As a consequence of some of these ideas we also give two new characterizations of flat torsion-free connections
- Concepts: 'flat', 'torsion-free', 'connections'

- Text: We also consider 2-categorical structure associated to the category of tangent categories and demonstrate that assignment of the tangent category of affine objects to a tangent category induces a 2-comonad.
- Concepts: '2-categorical structure', 'category of tangent categories', 'tangent category', 'affine objects', '2-comonad'

- Text: We introduce a new condition on an abstract span of categories which we refer to as having right fibred right adjoints, RFRA for short
- Concepts: 'abstract span', 'categories', 'right fibred right adjoints', 'RFRA'

- Text: We show that: (a) the span of split extensions of a semi-abelian category C has RFRA if and only if C is action representable; (b) the reversed span to the one considered in (a) has RFRA if and only if C is locally algebraically cartesian closed; (c) the span of split extensions of the category of morphisms of C has RFRA if and only if C is action representable and has normalizers; (d) the reversed span to the one considered in (c) has RFRA if and only if C is locally algebraically cartesian closed. We also examine our condition for the span of monoid actions (of monoids in a monoidal category C on objects in a given category on which C acts), and for various other spans.
- Concepts: 'semi-abelian category', 'RFRA', 'action representable', 'locally algebraically cartesian closed', 'split extensions', 'normalizers', 'monoid actions', 'monoidal category'

- Text: We relate the relative nerve $N_f(D)$ of a diagram of simplicial sets $f : D \to sSet$ with the Grothendieck construction $Gr F$ of a simplicial functor $F : D \to sCat$ in the case where $f = N F$
- Concepts: 'relative nerve', 'diagram', 'simplicial sets', 'Grothendieck construction', 'simplicial functor', 'sCat', 'N F'

- Text: We further show that any strict monoidal simplicial category C gives rise to a functor $C^\bullet : \Delta^\op \to sCat$, and that the relative nerve of $\N C^\bullet$ is the operadic nerve $\N^\otimes(C)$
- Concepts: strict monoidal simplicial category, functor, operadic nerve, relative nerve, Delta, sCat

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- Text: Finally, we show that all the above constructions commute with appropriately defined opposite functors.
- Concepts: constructions', 'opposite functors'

- Text: Certain aspects of Street's formal theory of monads in 2-categories are extended to multimonoidal monads in symmetric strict monoidal 2-categories
- Concepts: 'monads', '2-categories', 'multimonoidal monads', 'symmetric strict monoidal 2-categories'

- Text: Namely, any symmetric strict monoidal 2-category M admits a symmetric strict monoidal 2-category of pseudomonoids, monoidal 1-cells and monoidal 2-cells in M
- Concepts: 'symmetric', 'strict', 'monoidal', '2-category', 'pseudomonoids', 'monoidal 1-cells', 'monoidal 2-cells'

- Text: Dually, there is a symmetric strict monoidal 2-category of pseudomonoids, opmonoidal 1-cells and opmonoidal 2-cells in M
- Concepts: symmetric, strict monoidal 2-category, pseudomonoids, opmonoidal 1-cells, opmonoidal 2-cells

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- Text: Extending a construction due to Aguiar and Mahajan for M = Cat, we may apply the first construction p-times and the second one q-times (in any order)
- Concepts: construction, Cat

- Text: It yields a 2-category M_{pq}
- Concepts: '2-category'

- Text: A 0-cell therein is an object A of M together with p+q compatible pseudomonoid structures; it is termed a (p+q)-oidal object in M
- Concepts: 0-cell, object, pseudomonoid structures, (p+q)-oidal object

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- Text: A monad in M_{pq} is called a (p,q)-oidal monad in M; it is a monad t on A in M together with p monoidal, and q opmonoidal structures in a compatible way
- Concepts: 'monad', '(p,q)-oidal monad', 'monoidal structure', 'opmonoidal structure'

- Text: If M has monoidal Eilenberg-Moore construction, and certain (Linton type) stable coequalizers exist, then a (p+q)-oidal structure on the Eilenberg-Moore object A^t of a (p,q)-oidal monad (A,t) is shown to arise via a symmetric strict monoidal double functor to Ehresmann's double category Sqr(M) of squares in M, from the double category of monads in Sqr(M) in the sense of Fiore, Gambino and Kock

- Concepts: 'monoidal', 'Eilenberg-Moore construction', 'stable coequalizers', '(p+q)-oidal structure', '(p,q)-oidal monad', 'symmetric strict monoidal double functor', "Ehresmann's double category", 'squares in M', 'double category of monads', 'Fiore', 'Gambino', 'Kock'

- Text: While q ones of the pseudomonoid structures of A^t are lifted along the `forgetful' 1-cell A^t -> A, the other p ones are lifted along its left adjoint
- Concepts: 'pseudomonoid', 'lifted', 'forgetful', 'left adjoint'

- Text: In the particular example when M is an appropriate 2-subcategory of Cat, this yields a conceptually different proof of some recent results due to Aguiar, Haim and Lopez Franco.
- Concepts: '2-subcategory', 'Cat', 'proof', 'results', 'Aguiar', 'Haim', 'Lopez Franco'

- Text: We give necessary and sufficient conditions on a presentable ∞-category C so that families of objects of C form an ∞-topos
- Concepts: 'infinity category', 'presentable', 'families of objects', 'infinity topos'

- Text: In particular, we prove a conjecture of Joyal that this is the case whenever C is stable.
- Concepts: 'conjecture', 'stable'

- Text: In this paper, we introduce the notion of a pre-Lie 2-algebra, which is the categorification of a pre-Lie algebra
- Concepts: 'pre-Lie 2-algebra', 'categorification', 'pre-Lie algebra'

- Text: We prove that the category of pre-Lie 2-algebras and the category of 2-term pre-Lie$_\infty$-algebras are equivalent
- Concepts: 'category', 'pre-Lie 2-algebras', '2-term pre-Lie$_\infty$-algebras', 'equivalent'

- Text: We classify skeletal pre-Lie 2-algebras by the third cohomology group of a pre-Lie algebra
- Concepts: 'skeletal', 'pre-Lie 2-algebras', 'cohomology group', 'pre-Lie algebra'

- Text: We prove that crossed modules of pre-Lie algebras are in one-to-one correspondence with strict pre-Lie 2-algebras
- Concepts: 'crossed module', 'pre-Lie algebra', 'correspondence', 'strict pre-Lie 2-algebra'

- Text: O-operators on Lie 2-algebras are introduced, which can be used to construct pre-Lie 2-algebras
- Concepts: 'Lie 2-algebras', 'O-operators', 'pre-Lie 2-algebras'

- Text: As an application, we give solutions of 2-graded classical Yang-Baxter equations in some semidirect product Lie 2-algebras.
- Concepts: '2-graded', 'classical Yang-Baxter equations', 'semidirect product', 'Lie 2-algebras'

- Text: We introduce the notion of a majority category - the categorical counterpart of varieties of universal algebras admitting a majority term
- Concepts: 'majority category', 'categorical counterpart', 'varieties', 'universal algebras', 'majority term'

- Text: This notion can be thought to capture properties of the category of lattices, in a way that parallels how Mal'tsev categories capture properties of the category of groups
- Concepts: 'lattices', 'category of lattices', 'Mal'tsev categories', 'category of groups', 'properties'

- Text: Among algebraic majority categories are the categories of lattices, Boolean algebras and Heyting algebras
- Concepts: 'lattices', 'Boolean algebras', 'Heyting algebras'

- Text: Many geometric categories such as the category of topological spaces, metric spaces, ordered sets, any topos, etc., are comajority categories (i.e.~their duals are majority categories), and we show that, under mild assumptions, the only categories which are both majority and comajority, are the preorders
- Concepts: 'geometric category', 'category of topological spaces', 'metric spaces', 'ordered sets', 'topos', 'comajority categories', 'duals', 'majority categories', 'preorders'

- Text: Mal'tsev majority categories provide an alternative generalization of arithmetical categories to protoarithmetical categories in the sense of Bourn

- Concepts: 'Mal'tsev majority categories', 'generalization', 'arithmetical categories', 'protoarithmetical categories', 'Bourn'

- Text: We show that every Mal'tsev majority category is protoarithmetical, provide a counter-example for the converse implication, and show that in the Barr-exact context, the converse implication also holds
- Concepts: 'Mal'tsev majority category', 'protoarithmetical', 'counter-example', 'Barr-exact context'

- Text: We can then conclude that a category is arithmetical if and only if it is a Barr-exact Mal'tsev majority category, recovering in the varietal context a well known result of Pixley.
- Concepts: 'category', 'arithmetical', 'Barr-exact', 'Mal'tsev', 'majority category', 'varietal context', 'Pixley', 'result'

- Text: We define and study a probability monad on the category of complete metric spaces and short maps
- Concepts: 'probability monad', 'complete metric spaces', 'short maps'

- Text: It assigns to each space the space of Radon probability measures on it with finite first moment, equipped with the Kantorovich-Wasserstein distance
- Concepts: 'Radon probability measures', 'finite first moment', 'Kantorovich-Wasserstein distance'

- Text: This monad is analogous to the Giry monad on the category of Polish spaces, and it extends a construction due to van Breugel for compact and for 1-bounded complete metric spaces. We prove that this Kantorovich monad arises from a colimit construction on finite power-like constructions, which formalizes the intuition that probability measures are limits of finite samples
- Concepts: 'monad', 'Giry monad', 'category of Polish spaces', 'construction', 'van Breugel', 'compact', '1-bounded complete metric spaces', 'Kantorovich monad', 'colimit construction', 'finite power-like constructions', 'probability measures', 'limits', 'finite samples'

- Text: The proof relies on a criterion for when an ordinary left Kan extension of lax monoidal functors is a monoidal Kan extension
- Concepts: 'proof', 'criterion', 'left Kan extension', 'monoidal functor', 'monoidal Kan extension', 'lax monoidal functors'

- Text: The colimit characterization allows the development of integration theory and the treatment of measures on spaces of measures, without measure theory. We also show that the category of algebras of the Kantorovich monad is equivalent to the category of closed convex subsets of Banach spaces with short affine maps as morphisms.
- Concepts: 'colimit', 'integration theory', 'measures', 'spaces of measures', 'category theory', 'algebras', 'Kantorovich monad', 'closed convex subsets', 'Banach spaces', 'morphisms'

- Text: Let (C,E,s) be an extriangulated category
- Concepts: extriangulated category'

- Text: We show that certain quotient categories of extriangulated categories are equivalent to module categories by some restriction of functor E, and in some cases, they are abelian
- Concepts: 'extriangulated categories', 'quotient categories', 'module categories', 'functor', 'restriction of functor', 'abelian'

- Text: This result can be regarded as a simultaneous generalization of Koenig-Zhu and Demonet-Liu
- Concepts: generalization', 'Koenig-Zhu', 'Demonet-Liu'

- Text: In addition, we introduce the notion of maximal rigid subcategories in extriangulated categories
- Concepts: 'maximal rigid subcategories', 'extriangulated categories'

- Text: Cluster tilting subcategories are obviously strongly functorially finite maximal rigid subcategories, we prove that the converse is true if the 2-Calabi-Yau extriangulated categories admit a cluster tilting subcategories, which generalizes a result of Buan-Iyama-Reiten-Scott and Zhou-Zhu.
- Concepts: 'Cluster tilting subcategories', 'functorially finite', 'maximal rigid subcategories', '2-Calabi-Yau extriangulated categories', 'generalizes', 'Buan-Iyama-Reiten-Scott', 'Zhou-Zhu'

- Text: This paper shows that generalizations of operads equipped with their respective bar/cobar dualities are related by a six operations formalism analogous to that of classical contexts in algebraic geometry
- Concepts: "operads", "bar/cobar dualities", "six operations formalism", "algebraic geometry"

- Text: As a consequence of our constructions, we prove intertwining theorems which govern derived Koszul duality of push-forwards and pull-backs.
- Concepts: 'intertwining theorems', 'derived Koszul duality', 'push-forwards', 'pull-backs'

- Text: In this note we prove that distributors between groupoids in a Barr-exact category E form the bicategory of relations relative to the comprehensive factorization system in Gpd(E)
- Concepts: 'Barr-exact category', 'groupoids', 'distributors', 'bicategory', 'relations', 'comprehensive factorization system'

- Text: The case E = Set is of special interest.
- Concepts: 'Set'

- Text: This is the first part of a series of papers studying the problem of existence of double categories for which horizontal bicategory and object category are given
- Concepts: 'first part', 'series of papers', 'existence', 'double categories', 'horizontal bicategory', 'object category'

- Text: We refer to this problem as the problem of existence of internalizations for decorated bicategories
- Concepts: 'internalizations', 'decorated bicategories'

- Text: Motivated by this we introduce the condition of a double category being globularily generated
- Concepts: 'double category', 'globularily generated'

- Text: We prove that the problem of existence of internalizations for a decorated bicategory admits a solution if and only if it admits a globularily generated solution, and we prove that the condition of a double category being globularily generated is precisely the condition of a solution to the problem of existence of internalizations for a decorated bicategory being minimal in a sense which we will make precise
- Concepts: 'decorated bicategory', 'internalizations', 'globularily generated', 'double category', 'minimal solution'

- Text: The study of the condition of a double category being globularily generated will thus be pivotal in our study of the problem of existence of internalizations.
- Concepts: 'double category', 'globularily generated', 'existence', 'internalizations'

- Text: Let $(C,\otimes,1)$ be an abelian symmetric monoidal category satisfying certain exactness conditions
- Concepts: 'abelian', 'symmetric monoidal category', 'exactness conditions'

- Text: In this paper we define a presheaf $Proj{C}$ on the category of commutative algebras in C and we prove that this functor is a C-scheme in the sense of B
- Concepts: 'presheaf', 'category', 'commutative algebras', 'functor', 'scheme', 'B'

- Text: Toen and M
- Concepts: None provided as the context is incomplete and does not mention any math concepts.

- Text: Vaquie
- Concepts: Sorry, but there are no Math concepts present in the given context as it only consists of a single word "Vaquie".

- Text: We give another definition and prove that they give isomorphic C-schemes
- Concepts: isomorphic, schemes, C-schemes

- Text: This construction gives us a context of non-associative relative algebraic geometry
- Concepts: 'non-associative', 'relative algebraic geometry', 'construction'

- Text: The most important example of the construction is the octonionic projective space.
- Concepts: 'construction', 'octonionic', 'projective space'

- Text: We give a unified direct proof of the lifting of PIE limits to the 2-category of algebras and (pseudo) morphisms, which specifies precisely which of the projections of the lifted limit are strict and detect strictness
- Concepts: direct proof', 'PIE limits', '2-category', 'algebras', 'morphisms', 'projections', 'strictness'

- Text: In the literature, these limits were lifted one by one, so as to keep track of these projections in each case
- Concepts: 'limits', 'projections'

- Text: We work in the more general context of weak algebra morphisms, so as to include lax morphisms as well
- Concepts: 'weak algebra morphisms', 'lax morphisms'

- Text: PIE limits are also all simultaneously lifted in this case, provided some specified arrows of the diagram are pseudo morphisms
- Concepts: 'PIE limits', 'simultaneously lifted', 'specified arrows', 'pseudo morphisms'

- Text: Again, this unifies the previously known lifting of many particular PIE limits, which were also treated separately.
- Concepts: 'unifies', 'lifting', 'PIE limits'

- Text: Involutive category theory provides a flexible framework to describe involutive structures on algebraic objects, such as anti-linear involutions on complex vector spaces

- Concepts: 'involutive category theory', 'involutive structures', 'anti-linear involutions', 'complex vector spaces'

- Text: Motivated by the prominent role of involutions in quantum (field) theory, we develop the involutive analogs of colored operads and their algebras, named colored *-operads and *-algebras
- Concepts: involutions, quantum theory, field theory, colored operads, *-operads, *-algebras

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- Text: Central to the definition of colored *-operads is the involutive monoidal category of symmetric sequences, which we obtain from a general product-exponential 2-adjunction whose right adjoint forms involutive functor categories
- Concepts: colored *-operads', 'involutive monoidal category', 'symmetric sequences', 'product-exponential 2-adjunction', 'right adjoint', 'involutive functor categories'

- Text: For *-algebras over *-operads we obtain involutive analogs of the usual change of color and operad adjunctions
- Concepts: '-algebras', '*-operads', 'involutive', 'change of color', 'operad adjunctions'

- Text: As an application, we turn the colored operads for algebraic quantum field theory into colored *-operads
- Concepts: colored operads', 'algebraic quantum field theory', 'colored *-operads'

- Text: The simplest instance is the associative *-operad, whose *-algebras are unital and associative *-algebras.
- Concepts: '*-operad', '*-algebras', 'unital', 'associative'

- Text: We explain how, in the context of a semi-abelian category, the concept of an internal crossed square may be used to set up an intrinsic approach to the Brown-Loday non-abelian tensor product.
- Concepts: 'semi-abelian category', 'internal crossed square', 'Brown-Loday non-abelian tensor product', 'intrinsic approach'

- Text: In this paper we develop a theory of Segal enriched categories
- Concepts: 'Segal enriched categories', 'theory'

- Text: Our motivation was to generalize the notion of up-to-homotopy monoid in a monoidal category, introduced by Leinster
- Concepts: 'up-to-homotopy monoid', 'monoidal category', 'generalize', 'Leinster'

- Text: Our formalism generalizes the classical theory of Segal categories and extends the theory of categories enriched over a 2-category
- Concepts: 'Segal categories', 'categories enriched', '2-category', 'formalism'

- Text: We introduce Segal dg-categories which did not exist so far

- Concepts: 'Segal dg-categories'

- Text: We show that the homotopy transfer problem for algebras leads directly to a Leinster-Segal algebra.
- Concepts: 'homotopy transfer problem', 'algebras', 'Leinster-Segal algebra'

- Text: We consider pre-exponentiable objects of a pre-cartesian double category D, i.e., objects Y such that the lax functor - x Y: D --> D has a right adjoint in the 2-category LxDbl of double categories and lax functors
- Concepts: 'pre-exponentiable objects', 'pre-cartesian double category', 'lax functor', 'right adjoint', '2-category', 'double categories', 'lax functors'

- Text: When D has 2-glueing, we show that Y is pre-exponentiable in D if and only if Y is exponentiable in D_0 and - x Y is an oplax functor
- Concepts: 'pre-exponentiable', 'exponentiable', 'oplax functor', '2-glueing'

- Text: Thus, such a D is pre-cartesian closed as a double category if and only if D_0 is a cartesian closed category
- Concepts: 'pre-cartesian closed', 'double category', 'cartesian closed category'

- Text: Applications include the double categories cat, pos, spaces, loc, and topos, whose objects are small categories, posets, topological space, locales, and toposes, respectively.

- Concepts: 'double categories', 'category theory', 'small categories', 'posets', 'topological space', 'locales', 'toposes'

- Text: In previous work, we introduce an axiomatic framework within which to prove theorems about many varieties of infinite-dimensional categories simultaneously
- Concepts: 'axiomatic framework', 'theorems', 'infinite-dimensional categories'

- Text: In this paper, we establish criteria implying that an ∞-category --- for instance, a quasi-category, a complete Segal space, or a Segal category --- is complete and cocomplete, admitting limits and colimits indexed by any small simplicial set
- Concepts: ∞-category, quasi-category, complete Segal space, Segal category, complete, cocomplete, limits, colimits, simplicial set

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- Text: Our strategy is to build (co)limits of diagrams indexed by a simplicial set inductively from (co)limits of restricted diagrams indexed by the pieces of its skeletal filtration
- Concepts: 'simplicial set', 'inductively', 'co-limits', 'limits', 'diagrams', 'skeletal filtration'

- Text: We show directly that the modules that express the universal properties of (co)limits of diagrams of these shapes are reconstructible as limits of the modules that express the universal properties of (co)limits of the restricted diagrams

- Concepts: 'modules', 'universal properties', '(co)limits', 'diagrams', 'restricted diagrams', 'limits'

- Text: We also prove that the Yoneda embedding preserves and reflects limits in a suitable sense, and deduce our main theorems as a consequence.
- Concepts: 'Yoneda embedding', 'limits', 'main theorems'

- Text: We determine the largest submonoid of the monoid of continuous endomorphisms of the unit interval [0,1] on which the finite partitions form the basis of a Grothendieck topology, and thus determine a cohesive topos over sets
- Concepts: 'monoid', 'continuous endomorphisms', 'unit interval', 'finite partitions', 'Grothendieck topology', 'cohesive topos', 'sets'

- Text: We analyze some of the sheaf theoretic aspects of this topos
- Concepts: 'sheaf', 'topos', 'sheaf theory', 'topological space'

- Text: Furthermore, we adapt the constructions of Menni to include another model of axiomatic cohesion
- Concepts: 'constructions', 'axiomatic cohesion', 'model'

- Text: We conclude the paper with a proof of the fact that a sufficiently cohesive topos of presheaves does not satisfy the continuity axiom.
- Concepts: cohesive topos, presheaves, continuity axiom

- Text: We lift the standard equivalence between fibrations and indexed categories to an equivalence between monoidal fibrations and monoidal indexed categories, namely lax monoidal pseudofunctors to the 2-category of categories
- Concepts: 'equivalence', 'fibrations', 'indexed categories', 'monoidal fibrations', 'monoidal indexed categories', 'lax monoidal pseudofunctors', '2-category', 'categories'

- Text: Furthermore, we investigate the relation between this `global' monoidal version where the total category is monoidal and the fibration strictly preserves the structure, and a `fibrewise' one where the fibres are monoidal and the reindexing functors strongly preserve the structure, first hinted by Shulman
- Concepts: 'global monoidal version', 'total category', 'monoidal', 'fibration', 'fibrewise', 'fibres', 'reindexing functors', 'Shulman'

- Text: In particular, when the domain is cocartesian monoidal, we show how lax monoidal structures on a pseudofunctor to Cat bijectively correspond to lifts of the pseudofunctor to MonCat
- Concepts: 'cocartesian monoidal', 'lax monoidal structure', 'pseudofunctor', 'Cat', 'lifts', 'MonCat'

- Text: Finally, we give some examples where this correspondence appears, spanning from the fundamental and family fibrations to network models and systems.
- Concepts: 'fundamental fibrations', 'family fibrations', 'network models', 'systems'

- Text: In this paper we prove an equivalence theorem originally observed by Robert MacPherson
- Concepts: 'equivalence theorem', 'Robert MacPherson'

- Text: On one side of the equivalence is the category of cosheaves that are constructible with respect to a locally cone-like stratification
- Concepts: 'category', 'cosheaves', 'constructible', 'locally cone-like stratification'

- Text: Our constructibility condition is new and only requires that certain inclusions of open sets are sent to isomorphisms
- Concepts: 'constructibility condition', 'inclusions of open sets', 'isomorphisms'

- Text: On the other side of the equivalence is the category of functors from the entrance path category, which has points for objects and certain homotopy classes of paths for morphisms
- Concepts: 'category', 'functors', 'entrance path category', 'points', 'objects', 'homotopy classes of paths', 'morphisms'

- Text: When our constructible cosheaves are valued in Set we prove an additional equivalence with the category of stratified coverings.
- Concepts: 'constructible cosheaves', 'Set', 'equivalence', 'category', 'stratified coverings'

- Text: We show that the various higher Segal conditions of Dyckerhoff and Kapranov can all be characterized in purely categorical terms by higher excision conditions (in the spirit of Goodwillie--Weiss manifold calculus) on the simplex category Δ and the cyclic category Λ.
- Concepts: 'higher Segal conditions', 'categorical terms', 'higher excision conditions', 'simplex category', 'cyclic category'

- Text: The task of constructing compositional semantics for network-style diagrammatic languages, such as electrical circuits or chemical reaction networks, has been dubbed the black boxing problem, as it gives semantics that describes the properties of each network that can be observed externally, through composition, while discarding the internal structure
- Concepts: 'compositional semantics', 'network-style diagrammatic languages', 'electrical circuits', 'chemical reaction networks', 'black boxing problem', 'semantics', 'composition'

- Text: One way to solve these problems is to formalise the diagrams and their semantics using hypergraph categories, with semantic interpretation a hypergraph functor, called the black box functor, between them
- Concepts: 'hypergraph categories', 'semantic interpretation', 'hypergraph functor', 'black box functor'

- Text: Building on a previous method for constructing hypergraph categories and functors, known as decorated corelations, in this paper we construct a category of decorating data, and show that the decorated corelations method is itself functorial, with a universal property characterised by a left Kan extension

- Concepts: 'hypergraph categories', 'functors', 'decorated corelations', 'category', 'universal property', 'left Kan extension'

- Text: We then show that any hypergraph category can be presented in terms of decorating data, and hence argue that the category of decorating data is a good setting in which to construct any hypergraph functor
- Concepts: 'hypergraph category', 'presented', 'decorating data', 'category of decorating data', 'hypergraph functor'

- Text: As an example, we give a new construction of Baez and Pollard's black box functor for reaction networks.
- Concepts: 'construction', 'functor', 'reaction networks', 'black box functor'

- Text: For a diagram of simplicial combinatorial model categories, we show that the associated lax limit, endowed with the projective model structure, is a presentation of the lax limit of the underlying ∞-categories
- Concepts: 'simplicial combinatorial model categories', 'lax limit', 'projective model structure', 'presentation', 'underlying ∞-categories'

- Text: Our approach can also allow for the indexing category to be simplicial, as long as the diagram factors through its homotopy category

- Concepts: 'approach', 'indexing category', 'simplicial', 'diagram', 'homotopy category'

- Text: Analogous results for the associated homotopy limit (and other intermediate limits) directly follow.
- Concepts: 'homotopy limit', 'associated homotopy limit', 'intermediate limits'

- Text: We introduce a notion of "weak model category" which is a weakening of the notion of Quillen model category, still sufficient to define a homotopy category, Quillen adjunctions, Quillen equivalences, and most of the usual constructions of categorical homotopy theory
- Concepts: 'weak model category', 'Quillen model category', 'homotopy category', 'Quillen adjunctions', 'Quillen equivalences', 'categorical homotopy theory'

- Text: Both left and right semi-model categories are weak model categories, and the opposite of a weak model category is again a weak model category. The main advantage of weak model categories is that they are easier to construct than Quillen model categories
- Concepts: 'semi-model categories', 'weak model categories', 'opposite', 'Quillen model categories'

- Text: In particular we give some simple criteria on two weak factorization systems for them to form a weak model category
- Concepts: 'weak factorization system', 'weak model category'

- Text: The theory is developed in a very weak constructive, even predicative, framework and we use it to give constructive proofs of the existence of weak versions of various standard model categories, including the Kan-Quillen model structure, Lurie's variant of the Joyal model structure on marked simplicial sets, and the Verity model structure for weak complicial sets
- Concepts: 'constructive', 'predicative', 'existence', 'model category', 'Kan-Quillen model structure', 'Joyal model structure', 'marked simplicial sets', 'Verity model structure', 'weak complicial sets'

- Text: We also construct semi-simplicial versions of all these.
- Concepts: 'semi-simplicial'

- Text: Given a bicategory C and a family W of arrows of C, we give conditions on the pair (C,W) that allow us to construct the bicategorical localization with respect to W by dealing only with the 2-cells, that is without adding objects or arrows to C
- Concepts: 'bicategory', 'arrows', 'conditions', 'localization', '2-cells'

- Text: We show that in this case, the 2-cells of the localization can be given by the homotopies with respect to W, a notion defined in this article which is closely related to Quillen's notion of homotopy for model categories but depends only on a single family of arrows
- Concepts: 'localization', '2-cells', 'homotopies', 'W', 'article', 'Quillen', 'model categories', 'family of arrows'

- Text: This localization result has a natural application to the construction of the homotopy bicategory of a model bicategory, which we develop elsewhere, as the pair (C_{fc},W) given by the weak equivalences between fibrant-cofibrant objects satisfies the conditions given in the present article.
- Concepts: localization, homotopy bicategory, model bicategory, weak equivalences, fibrant-cofibrant objects

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- Text: Restriction categories were introduced as a way of generalising the notion of partial map category
- Concepts: 'restriction categories', 'generalising', 'partial map category'

- Text: In this paper, we define a notion of cocompleteness for restriction categories, and describe the free cocompletion of a small restriction category as a suitably defined category of restriction presheaves
- Concepts: 'restriction category', 'cocompleteness', 'free cocompletion', 'restriction presheaves'

- Text: We also consider free cocompletions in the case where our restriction category is only locally small.
- Concepts: 'cocompletions', 'restriction category', 'locally small'

- Text: We prove that the folk model category structure on the category of strict ω-categories, introduced by Lafont, Métayer and Worytkiewicz, is monoidal, first, for the Gray tensor product and, second, for the join of ω-categories, introduced by the first author and Maltsiniotis

- Concepts: 'folk model category', 'strict ω-categories', 'monoidal', 'Gray tensor product', 'join of ω-categories'

- Text: We moreover show that the Gray tensor product induces, by adjunction, a tensor product of strict (m,n)-categories and that this tensor product is also compatible with the folk model category structure
- Concepts: Gray tensor product', 'adjunction', 'tensor product', 'strict (m,n)-categories', 'folk model category structure'

- Text: In particular, we get a monoidal model category structure on the category of strict ω-groupoids
- Concepts: monoidal model category structure, strict ω-groupoids

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- Text: We prove that this monoidal model category structure satisfies the monoid axiom, so that the category of Gray monoids, studied by the second author, bears a natural model category structure.
- Concepts: 'monoidal model category structure', 'monoid axiom', 'Gray monoids', 'natural model category structure'

- Text: Cheng, Gurski, and Riehl constructed a cyclic double multicategory of multivariable adjunctions
- Concepts: 'cyclic double multicategory', 'multivariable adjunctions'

- Text: We show that the same information is carried by a poly double category, in which opposite categories are polycategorical duals
- Concepts: 'poly double category', 'opposite categories', 'polycategorical duals'

- Text: Moreover, this poly double category is a full substructure of a double Chu construction, whose objects are a sort of polarized category, and which is a natural home for 2-categorical dualities. We obtain the double Chu construction using a general "Chu-Dialectica" construction on polycategories, which includes both the Chu construction and the categorical Dialectica construction of de Paiva
- Concepts: 'poly double category', 'double Chu construction', 'polarized category', '2-categorical dualities', 'Chu-Dialectica construction', 'polycategories', 'categorical Dialectica construction'

- Text: The Chu and Dialectica constructions each impose additional hypotheses making the resulting polycategory representable (hence *-autonomous), but for different reasons; this leads to their apparent differences.
- Concepts: Chu construction, Dialectica construction, polycategory, representable, *-autonomous

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- Text: Networks can be combined in various ways, such as overlaying one on top of another or setting two side by side
- Concepts: 'networks', 'combined', 'overlaying', 'top', 'setting', 'side by side'

- Text: We introduce `network models' to encode these ways of combining networks
- Concepts: 'network models', 'combining networks'

- Text: Different network models describe different kinds of networks
- Concepts: 'network models'

- Text: We show that each network model gives rise to an operad, whose operations are ways of assembling a network of the given kind from smaller parts
- Concepts: 'network model', 'operad', 'assembling', 'smaller parts'

- Text: Such operads, and their algebras, can serve as tools for designing networks
- Concepts: operads, algebras, networks

- Text: Technically, a network model is a lax symmetric monoidal functor from the free symmetric monoidal category on some set to Cat, and the construction of the corresponding operad proceeds via a symmetric monoidal version of the Grothendieck construction.
- Concepts: 'network model', 'symmetric monoidal functor', 'free symmetric monoidal category', 'Cat', 'operad', 'Grothendieck construction'

- Text: In contrast to the fact that every completely distributive lattice is necessarily continuous in the sense of Scott, it is shown that complete distributivity of a category enriched over the closed category obtained by endowing the unit interval with a continuous t-norm does not imply its continuity in general

- Concepts: 'completely distributive lattice', 'continuous', 'Scott', 'category enriched', 'closed category', 'unit interval', 'continuous t-norm', 'continuity'

- Text: Necessary and sufficient conditions for the implication are presented.
- Concepts: 'implication', 'necessary conditions', 'sufficient conditions'

- Text: We introduce the notion of a braiding on a skew monoidal category, whose curious feature is that the defining isomorphisms involve three objects rather than two
- Concepts: 'braiding', 'skew monoidal category', 'defining isomorphisms', 'three objects'

- Text: Examples are shown to arise from 2-category theory and from bialgebras
- Concepts: 2-category theory, bialgebras

- Text: In order to describe the 2-categorical examples, we take a multicategorical approach
- Concepts: '2-categorical', 'multicategorical'

- Text: We explain how certain braided skew monoidal structures in the 2-categorical setting give rise to braided monoidal bicategories

- Concepts: 'braided skew monoidal structures', '2-categorical setting', 'braided monoidal bicategories'

- Text: For the bialgebraic examples, we show that, for a skew monoidal category arising from a bialgebra, braidings on the skew monoidal category are in bijection with cobraidings (also known as coquasitriangular structures) on the bialgebra.
- Concepts: 'bialgebra', 'skew monoidal category', 'braiding', 'bijection', 'cobraidings', 'coquasitriangular structures'
