Curriculum vitæ

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Research Interests

Category theory and everything about it.

- Stable ∞-categories
- Homotopical algebra
- Groth(endieck) derivators
- 2-categories and formal category theory
- locally presentable and accessible categories
- type theory and functional programming.

Currently working on: coend calculus; bicategories of generalised profunctors as an axiomatisation of integral kernels; profunctor algebras in functional programming; bicategories of profunctors seen as universal semantics for 2-dimensional algebraic theories (in the large); teaching category theory to computer scientists; ontology, mereology and the Yoneda lemma: a novel view on the identity principle; formal category theory.

Current position

1 | **Postdoctoral fellow** — Jan 2020 | –
Tallinna Tehnikaülikooli Küberneetika Instituut | Tallinn EE

Past positions

1 | **Postdoctoral fellow** — Jul 2019 | Dec 2019
Centro de Matemática da Universidade de Coimbra | Coimbra PT

2 | **Postdoctoral fellow** — Sep 2018 | Feb 2019
Max-Planck-Institut für Mathematik | Bonn D

3 | **Postdoctoral fellow** — Mar 2017 | Apr 2018
Masarykova univerzita | Brno CZ

4 | **Postdoctoral fellow and Assistant Professor** — Sep 2016 | Nov 2016
University of Western Ontario | London CA

Education 2008 | 2012

1 | **Ph.D. in Mathematics** Oct 2012 | Jun 2016
SISSA | Trieste
thesis: *t-structures on stable ∞-categories*

2 | **M.Sc. in Mathematics** Oct 2010 | Jul 2012
Università degli studi di Padova
thesis: *Orlov reconstruction theorem*

3 | **B.Sc. in Mathematics** Jan 2008 | Jun 2010
Università degli studi di Padova
thesis: *Monads and Beck's theorem*

Publications

1 | **Triangulated factorization systems and *t*-structures** w/S. Virili |
1705.08565v3 | *Journal of Algebra* | doi:10.1016/j.jalgebra.2019.12.021

2 | **Categorical notions of fibration** w/E. Riehl |
1806.06129 | *Expos. Math.* (2019) | doi:10.1016/j.exmath.2019.02.004

3 | **Hearts and towers in stable infinity-categories** w/D. Fiorenza, G. Marchetti |
1501.04658 | *Journal of Homotopy and Related Structures* 2019 | doi:10.1007/s40062-019-00237-0

4 | **A standard theorem on adjunctions in two variables**
1902.06074 | Preprints of the MPIM, 2018 (67)

5 | **A Fubini rule for ∞-coends**
1902.06086 | Preprints of the MPIM, 2018 (68)

6 | **Homotopical Algebra is not concrete** w/I. Di Liberti |
1704.00303 | *Journal of Homotopy and Related Structures* (2017): 1-15 | doi:10.1007/s40062-018-0197-3

7 | **Sober Ontic Structural Realism and Yoneda lemma**
abstract at the *Triennial conference of the SILFS*, Bologna

8 | **Coend calculus**
based on 1501.02503v4 | book to appear for Cambridge University Press (2020?)

9 | **t-structures are normal torsion theories** w/D. Fiorenza |
1408.7003 | Applied Categorical Structures 24.2 (2016): 181-208 | doi:10.1007/s10485-015-9393-z

Preprints

1 | **Profunctor optics, a categorical update** w/B. Clarke, et al. |
2001.07488

2 | **On the unicity of formal category theories** w/I. Di Liberti |
1901.01594v1 | Submitted to TAC, January 2019

3 | **Accessibility and presentability in 2-categories** w/I. Di Liberti |
1804.08710v4 | Submitted to JPAA, January 2019

4 | **Localization theory for derivators**
1802.08193v1 | Submitted to TAC, March 2018

5 | **Recollements in stable ∞-categories** w/D. Fiorenza |
1507.03913v2

Talks

1 | **The art of $\int$** Dec 2019
Invited speaker | ItaCa - Italian Category theorists conference

2 | **Axiomatic cohesion of toposes** Dec 2019
Invited speaker | Università "La Sapienza" - Rome

3 | **The formal category theory of derivators** Apr 2019
Invited speaker | Workshop on Derivators - Regensburg

4 | **On the unicity of the formal theory of categories** Dec 2018
Talk on 1901.01594 | ULB - Bruxelles

5 | **Accessibility and Presentability in 2-categories** Nov 2018
Talk on 1804.08710 | Università degli studi di Torino

6 | **Homotopical algebra is not concrete** Sep 2017
Contributed talk | *British Topology Meeting* | Leicester

7 | **The formal category theory of derivators** Sep 2017
Invited speaker | *Some trends in Algebra* | Prague

8 | **Sober Ontic Structural Realism** Jun 2017
Invited speaker | *SILFS* | Bologna

9 | **Model categories** May 2017
Invited speaker | *A categorical day in Turin* | Torino

10 | **t-derivators** Feb 2017
Invited speaker | *Young researchers in homotopy theory*, Bonn

11 | **Coend calculus** May 2016
Lectures on 1501.02503 | Leeds

Teaching & Organizational activities

1 | 🎓 **ITI9200 - Introduction to Category Theory** Jan 2020 | Jun 2020
Introduction to Category Theory and its Applications (*Sissejuhatus kategooriateooriasse ja selle rakendustesse*).

2 | **appointee for Adjoint school 2019** Mar 2019 | Jun 2019
A webinar and online applied Category Theory reading course. The project name is *Traversal optics and profunctors*. Led to the development of arXiv:2001.07488.

3 | **2-categories** Padova - IT
A short course on 2-dimensional category theory. Tentative program: monoidal and enriched categories, the calculus of coends and Kan extensions, 2-categories, the bicategory of profunctors, the 2-category of derivators, 2-dimensional limits, the formal theory of monads, formal category theory.

4 | **PSSL 103 - Brno** MU Brno - CZ
I have been one of the organizers of 103rd Peripathetic Seminar on Sheaves and Logic.

5 | **Formal category theory** MU Brno - CZ
A series of lectures having the scope to breach in Riehl-Verity's theory of ∞-cosmoi.

6 | **Elements of Finite Mathematics** UWO London - CA
Techniques of counting, probability, discrete and continuous random variables.

7 | **Homotopical Algebra** MU Brno - CZ
A bottom-up introduction to the language of Homotopical Algebra

8 | **appointee for Kan Extension Seminar I** Jan 2014 | Jul 2014
A webinar and online Category Theory reading course.

9 | **supervisor and coadvisor B.Sc. in Mathematics** *student: Giovanni Ronchi*
Adjoint Functors | amslaurea.unibo.it

Other activities

1 | **Sparse skills**
I like the art of crafting books and drawing maps; this is not unrelated to my love for Mathematics. I am a pretty decent TeXnic (I maintain this CV as a github repo here). I know bits of Haskell, Python, and Wolfram. I like artificial languages (mi ŝatus verki vortaron al matematiko, kun terminoj el teoria kategorioj); again, this is not unrelated to my love for Mathematics.

2 | **Reviewer for**
zbMath, AMS Math. Rev.