

# Curriculum vitæ

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## RESEARCH INTERESTS

Category theory and everything about it.

- 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; formal category theory.

## CURRENT POSITION

- 1 | **Postdoctoral fellow**  
Tallinna Tehnikaülikooli Küberneetika Instituut | Tallinn EE

Jan 2020 | now

## PAST POSITIONS

- 1 | **Postdoctoral fellow**  
Centro de Matemática da Universidade de Coimbra | Coimbra
- 2 | **Postdoctoral fellow**  
Max-Planck-Institut für Mathematik | Bonn
- 3 | **Postdoctoral fellow**  
Masarykova univerzita | Brno
- 4 | **Postdoctoral fellow and Assistant Professor**  
University of Western Ontario | London

Jul 2019 | Dec 2019

Sep 2018 | Feb 2019

Mar 2017 | Apr 2018

Sep 2016 | Nov 2016

## EDUCATION

2008 | 2012

- 1 | **Ph.D. in Mathematics**  
SISSA | Trieste  
**thesis:** *t-structures on stable oo-categories* : [arXiv2005.14295](https://arxiv.org/abs/2005.14295)
- 2 | **M.Sc. in Mathematics**  
Università degli studi di Padova  
**thesis:** *Orlov reconstruction theorem*

Oct 2012 | Jun 2016

Oct 2010 | Jul 2012

## PUBLICATIONS

- 1 | **A Categorical Semantics for Hierarchical Petri Nets** w/F. Genovese, J. Herold, D. Palombi |  
2102.00096 | Proc. of GCM, 2021 Springer.
- 2 | **Nets with Mana: A Framework for Chemical Reaction Modelling** w/F. Genovese, D. Palombi |  
2101.06234 | *Graph Transformation*, Proc. of ICGT, 2021 Springer.
- 3 | **Functorial semantics for partial theories** w/I. Di Liberti, et al. |  
2011.06644 | Proc. ACM Program. Lang. 5, POPL, 2021. | doi:10.1145/3434338
- 4 | **Triangulated factorization systems and  $t$ -structures** w/S. Virili |  
1705.08565v3 | *Journal of Algebra* | doi:10.1016/j.jalgebra.2019.12.021
- 5 | **Categorical notions of fibration** w/E. Riehl |  
1806.06129 | *Expos. Math.* (2019) | doi:10.1016/j.exmath.2019.02.004
- 6 | **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
- 7 | **A standard theorem on adjunctions in two variables**  
1902.06074 | *Preprints of the MPIM*, 2018 (67)
- 8 | **A Fubini rule for  $\infty$ -coends**  
1902.06086 | *Preprints of the MPIM*, 2018 (68)
- 9 | **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
- 10 | **Sober Ontic Structural Realism and Yoneda lemma**  
abstract at the *Triennial conference of the SILFS*, Bologna
- 11 | **Coend calculus**  
1501.02503 | LMS Lecture Note Series 468. Cambridge University Press. 2021. ISBN 9781108778657.
- 12 |  **$t$ -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 | **Escrows are optics** w/F. Genovese, D. Palombi |  
2105.10028
- 2 | **Differential 2-rigs** w/F. Genovese |  
2103.00938
- 3 | **A Categorical Semantics for Bounded Petri Nets** w/F. Genovese, D. Palombi |  
2101.09100
- 4 | **Rosen's no-go theorem for regular categories**  
2012.11648
- 5 | **Functorial Erkennen** w/D. Dentamaro |  
<http://philsci-archive.pitt.edu/18519/>

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| 6   <b>Coends of higher arity</b><br>2011.13881  | w/T. de Oliveira Santos |
| 7   <b>Categorical Ontology I</b><br><a href="http://philsci-archive.pitt.edu/17136/">http://philsci-archive.pitt.edu/17136/</a> | w/D. Dentamaro          |
| 8   <b>Profunctor optics, a categorical update</b><br>2001.07488   | w/B. Clarke, et al.     |
| 9   <b>On the unicity of formal category theories</b><br>1901.01594v1  | w/I. Di Liberti         |
| 10   <b>Accessibility and presentability in 2-categories</b><br>1804.08710v4   | w/I. Di Liberti         |
| 11   <b>Localization theory for derivators</b><br>1802.08193v1   |                         |
| 12   <b>Recollements in stable <math>\infty</math>-categories</b><br>1507.03913v2  | w/D. Fiorenza           |

## TALKS

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| 1   <b>The art of <math>\int</math></b><br>Invited speaker   ItaCa - Italian Category theorists conference           | Dec 2019 |
| 2   <b>Axiomatic cohesion of toposes</b><br>Invited speaker   Università "La Sapienza" - Rome                        | Dec 2019 |
| 3   <b>The formal category theory of derivators</b><br>Invited speaker   Workshop on Derivators - Regensburg         | Apr 2019 |
| 4   <b>On the unicity of the formal theory of categories</b><br>Talk on 1901.01594   ULB - Bruxelles                 | Dec 2018 |
| 5   <b>Accessibility and Presentability in 2-categories</b><br>Talk on 1804.08710   Università degli studi di Torino | Nov 2018 |
| 6   <b>Homotopical algebra is not concrete</b><br>Contributed talk   <i>British Topology Meeting</i>   Leicester     | Sep 2017 |
| 7   <b>The formal category theory of derivators</b><br>Invited speaker   <i>Some trends in Algebra</i>   Prague      | Sep 2017 |
| 8   <b>Sober Ontic Structural Realism</b><br>Invited speaker   <i>SILFS</i>   Bologna                                | Jun 2017 |
| 9   <b>Model categories</b><br>Invited speaker   <i>A categorical day in Turin</i>   Torino                          | May 2017 |
| 10   <b><math>t</math>-derivators</b><br>Invited speaker   <i>Young researchers in homotopy theory</i> , Bonn        | Feb 2017 |
| 11   <b>Coend calculus</b><br>Lectures on 1501.02503   Leeds   | May 2016 |

## TEACHING & ORGANIZATIONAL ACTIVITIES

- 1 |  **ITI9200 - Introduction to Category Theory** Jan 2021 | May 2021  
 Introduction to Category Theory and its Applications (*Sissejuhatus kategooriateooriasse ja selle rakendustesse*). Part of the MSc in Software Engineering at TalTech. Here you find the [course webpage](#) on talcats.io.
- 2 |  **ITI9200 - Introduction to Category Theory** Jan 2020 | May 2020  
 Introduction to Category Theory and its Applications (*Sissejuhatus kategooriateooriasse ja selle rakendustesse*). Part of the MSc in Software Engineering at TalTech.
- 3 |  **Organiser of ItaCa Fest** June 2020 –  
 An online webinar aimed to gather the community of [ItaCa](#).
- 4 |  **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](#).
- 5 |  **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.
- 6 |  **PSSL 103 - Brno** MU Brno - CZ  
 I have been one of the organizers of 103rd Peripathetic Seminar on Sheaves and Logic.
- 7 |  **Formal category theory** MU Brno - CZ  
 A series of lectures having the scope to breach in Riehl-Verity's theory of  $\infty$ -cosmoi.
- 8 |  **Elements of Finite Mathematics** UWO London - CA  
 Techniques of counting, probability, discrete and continuous random variables.
- 9 |  **Homotopical Algebra** MU Brno - CZ  
 A bottom-up introduction to the language of Homotopical Algebra
- 10 |  **appointee for Kan Extension Seminar I** Jan 2014 | Jul 2014  
 A webinar and online Category Theory reading course.
- 11 |  **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 šatus 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.

*Foto Loregia*