

# Curriculum vitæ

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## RESEARCH INTERESTS

Category theory and everything about it.

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

## PRESENT POSITION

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|--|--------------|
| 1   <b>Postdoctoral fellow</b>                               | Jan 2020   — |
| Tallinna Tehnikaülikooli Küberneetika Instituut   Tallinn EE |              |

## PAST POSITIONS

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|--|---------------------|
| 1   <b>Postdoctoral fellow</b>                               | Jul 2019   Dec 2019 |
| Centro de Matemática da Universidade de Coimbra   Coimbra PT |                     |
| 2   <b>Postdoctoral fellow</b>                               | Sep 2018   Feb 2019 |
| Max-Planck-Institut für Mathematik   Bonn D                  |                     |
| 3   <b>Postdoctoral fellow</b>                               | Mar 2017   Apr 2018 |
| Masarykova univerzita   Brno CZ                              |                     |
| 4   <b>Postdoctoral fellow and Assistant Professor</b>       | Sep 2016   Nov 2016 |
| University of Western Ontario   London CA                    |                     |

## EDUCATION

2008 | 2012

- |   |                     |
|---|---------------------|
| 1   <b>Ph.D. in Mathematics</b>   | Oct 2012   Jun 2016 |
| SISSA   Trieste   |                     |
| <b>thesis:</b> <i>t-structures on stable <math>\infty</math>-categories</i> |                     |
| 2   <b>M.Sc. in Mathematics</b>   | Oct 2010   Jul 2012 |
| Università degli studi di Padova  |                     |
| <b>thesis:</b> <i>Orlov reconstruction theorem</i>                          |                     |
| 3   <b>B.Sc. in Mathematics</b>   | Jan 2008   Jun 2010 |
| Università degli studi di Padova  |                     |
| <b>thesis:</b> <i>Monads and Beck's theorem</i>                             |                     |

## 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  $\infty$ -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  $\infty$ -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	<b>Homotopical algebra is not concrete</b> Contributed talk   <i>British Topology Meeting</i>   Leicester	Sep 2017
7	<b>The formal category theory of derivators</b> Invited speaker   <i>Some trends in Algebra</i>   Prague	Sep 2017
8	<b>Sober Ontic Structural Realism</b> Invited speaker   <i>SILFS</i>   Bologna	Jun 2017
9	<b>Model categories</b> Invited speaker   <i>A categorical day in Turin</i>   Torino	May 2017
10	<b><i>t</i>-derivators</b> Invited speaker   <i>Young researchers in homotopy theory</i> , Bonn	Feb 2017
11	<b>Coend calculus</b> Lectures on <a href="#">1501.02503</a>   Leeds	May 2016

## TEACHING & ORGANIZATIONAL ACTIVITIES

🎓: teaching (courses, thesis supervision...); 🗓️: conferences I organised.

- 1 | 🎓 **ITI9200 - Introduction to Category Theory** Jan 2020 | Jun 2020  
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 syllabus](#), and the [course webpage](#) on tallcats.io. The course is an introduction to the basic concepts of Category Theory (categories, functors, natural transformations, universal properties, limits, colimits, monoidal categories, string diagrams...) and some applications in Computer Science.
- 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  $\infty$ -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.

Foto Loregia