

# Curriculum vitæ

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fosco.loregian@gmail.com  
fouche@yoneda.ninja  
fosco.loregian@taltech.ee

Fosco Loregian  
github.com/tetrapharmakon  
fosco.loregian



## RESEARCH INTERESTS

Category theory and everything about it.

- Stable co-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; formal category theory.

## CURRENT POSITION

1 | **Postdoctoral fellow**

Tallinna Tehnikaülikooli Küberneetika Instituut | Tallinn EE

Jan 2020 | –

## PAST POSITIONS

1 | **Postdoctoral fellow**

Centro de Matemática da Universidade de Coimbra | Coimbra 

Jul 2019 | Dec 2019

2 | **Postdoctoral fellow**

Max-Planck-Institut für Mathematik | Bonn 

Sep 2018 | Feb 2019

3 | **Postdoctoral fellow**

Masarykova univerzita | Brno 

Mar 2017 | Apr 2018




4 | **Postdoctoral fellow and Assistant Professor**

University of Western Ontario | London CA

Sep 2016 | Nov 2016

## EDUCATION

2008 | 2012

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

## PUBLICATIONS

- |   |                                      |
|---|--------------------------------------|
| <p>1   <b>Triangulated factorization systems and <i>t</i>-structures</b><br/>         1705.08565v3   <i>Journal of Algebra</i>   doi:10.1016/j.jalgebra.2019.12.021</p>               | <p>w/S. Virili  </p>                 |
| <p>2   <b>Categorical notions of fibration</b><br/>         1806.06129   <i>Expos. Math.</i> (2019)   doi:10.1016/j.exmath.2019.02.004</p>  | <p>w/E. Riehl  </p>                  |
| <p>3   <b>Hearts and towers in stable infinity-categories</b><br/>         1501.04658   <i>Journal of Homotopy and Related Structures</i> 2019   doi:10.1007/s40062-019-00237-0</p>   | <p>w/D. Fiorenza, G. Marchetti  </p> |
| <p>4   <b>A standard theorem on adjunctions in two variables</b><br/>         1902.06074   <i>Preprints of the MPIM</i>, 2018 (67)</p>  |                                      |
| <p>5   <b>A Fubini rule for <math>\infty</math>-coends</b><br/>         1902.06086   <i>Preprints of the MPIM</i>, 2018 (68)</p>  |                                      |
| <p>6   <b>Homotopical Algebra is not concrete</b><br/>         1704.00303   <i>Journal of Homotopy and Related Structures</i> (2017): 1-15   doi:10.1007/s40062-018-0197-3</p>        | <p>w/I. Di Liberti  </p>             |
| <p>7   <b>Sober Ontic Structural Realism and Yoneda lemma</b><br/>         abstract at the <i>Triennial conference of the SILFS</i>, Bologna</p>                                      |                                      |
| <p>8   <b>Coend calculus</b><br/>         based on 1501.02503v4   book to appear for Cambridge University Press (2020?)</p>   |                                      |
| <p>9   <b><i>t</i>-structures are normal torsion theories</b><br/>         1408.7003   <i>Applied Categorical Structures</i> 24.2 (2016): 181-208   doi:10.1007/s10485-015-9393-z</p> | <p>w/D. Fiorenza  </p>               |

## PREPRINTS



- |   |                              |
|---|------------------------------|
| <p>1   <b>Profunctor optics, a categorical update</b><br/>         2001.07488</p>                                       | <p>w/B. Clarke, et al.  </p> |
| <p>2   <b>On the unicity of formal category theories</b><br/>         1901.01594v1   Submitted to TAC, January 2019</p> | <p>w/I. Di Liberti  </p>     |

- 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 | **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 |  **IT19200 - 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  $\infty$ -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](https://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*