

Ivan Di Liberti

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Research keywords

LOGIC, FOUNDATIONS OF MATHEMATICS, CATEGORY THEORY

Logic, Foundations of Mathematics, Categorical Logic, Stone-type dualities for propositional and first order logic, interactions between logic and geometry, categorical approaches to geometry and topology, accessible and locally presentable categories, toposes, sketches, semantics for type theories.

Education

Ph.D. in Mathematics

MASARYK UNIVERSITY

Dissertation: [The Scott Adjunction](#)

Advisor: [Jiří Rosický](#)

[Brno, Czech Republic](#)

Feb. 2017 - Sept. 2020

MSc in Mathematics

UNIVERSITÀ DI PISA

Dissertation: A survey on Barr's Theorem

Advisors: Nicola Gambino, Alessandro Berarducci

[Pisa, Italy](#)

Mar. 2015 - Dec. 2016

BSc in Mathematics

UNIVERSITÀ DI PISA

Dissertation: Definable groups in o-minimal structures

Advisor: Alessandro Berarducci

[Pisa, Italy](#)

Sept. 2011 - Mar. 2015

Appointments

Postdoc

UNIVERSITY OF GOTHENBURG, DEPARTMENT OF PHILOSOPHY, LINGUISTICS AND THEORY OF SCIENCE

Project: [Logical Foundations of Circularity](#)

Supervisor: [Graham Leigh](#)

[Gothenburg, Sweden](#)

Oct 2023 - Oct 2026

Postdoc

STOCKHOLM UNIVERSITY, DEPARTMENT OF MATHEMATICS

Project: Cubical methods for computer formalization of mathematics

Supervisor: [Anders Mortberg](#)

[Stockholm, Sweden](#)

Jan 2022 - Sept 2023

Postdoc

CZECH ACADEMY OF SCIENCES, INSTITUTE OF MATHEMATICS

Project: [Abstract Convergence Schemes And Their Complexities](#)

Coordinator: [Wiesław Kubiś](#)

[Prague, Czech Republic](#)

Jul 2020 - Dec 2021

Awards and Grants

2024 VR Starting grant (Pending) (approx 380k euro),

The VR starting grant of the Swedish Research Council is designed to give junior researchers the opportunity to establish themselves as independent researchers in Sweden.

2021 Masaryk University Vice-rector's award for excellent results in doctoral studies,

Forty graduates of doctoral programmes and their lecturers have recently accepted from Vice-rector for research and doctoral studies Šárka Popířilová [an award](#) for excellent achievements in their doctoral studies at Masaryk University.

2021 EPSRC Postdoctoral fellowship application (Unsuccessful) (approx 330k euro),

The EPSRC Postdoctoral Fellowship is designed to support aspiring and current world-leading researchers who are delivering high-quality research to meet UK and global priorities. It focuses on developing researchers with great potential at the postdoctoral, early, and established career stages. My evaluation was 6/6, 5/6, 5/6, 4/6.

Publications

- 2024 **Adjoint functor theorems for lax-idempotent pseudomonads**,
Theory and Application of Categories. Vol. 41, 2024, No. 20, pp 667-685. *j/w Arkor, Loregian*
- 2024 **Context, Judgement, Deduction**,
Conditionally accepted by Proceedings of CatMi 2023. [arXiv:2111.09438](#). *j/w Greta Coraglia*
- 2024 **Coalgebras for Vietoris and monadicity**,
The Journal of Symbolic Logic. [10.1017/jsl.2024.14](#). *j/w Marco Abbadini*
- 2024 **The geometry of coherent topoi and Ultrastructures**,
Conditionally accepted by The Journal of Symbolic Logic. [arXiv:2211.03104](#).
- 2023 **Formal Model Theory & Higher Topology**,
Mathematical Logic Quarterly. [10.1002/malq.202300006](#).
- 2023 **KZ-pseudomonads and Kan Injectivity**,
Theory and Applications of Categories, [arXiv:2211.00380](#). *j/w Lobbia, Sousa*
- 2022 **Accessibility and Presentability in 2-categories**,
Journal of Pure and Applied Algebra, [10.1016/j.jpaa.2022.107155](#). *j/w Fosco Loregian*
- 2022 **Exponentiable Grothendieck categories in flat Algebraic Geometry**,
Journal of Algebra, [10.1016/j.jalgebra.2022.03.040](#). *j/w Julia Ramos González*
- 2022 **Enriched locally generated categories**,
Theory and Applications of Categories, Vol. 38, 2022, No. 17, pp 661-683. *j/w Jiří Rosický*
- 2021 **General facts on the Scott Adjunction**,
Applied Categorical Structures, [10.1007/s10485-021-09666-6](#).
- 2021 **Towards Higher Topology**,
Journal of Pure and Applied Algebra, [10.1016/j.jpaa.2021.106838](#).
- 2021 **Functorial Semantics for Partial Theories**,
Symposium on Principles of Programming Languages (POPL21), [10.1145/3434338](#). *j/w Loregian, Nester, Sobocinski*
- 2020 **Codensity: Isbell duality, pro-objects, compactness and accessibility**,
Journal of Pure and Applied Algebra, [10.1016/j.jpaa.2020.106379](#)
- 2020 **Gabriel-Ulmer duality for topoi and its relation with site presentations**,
Applied Categorical Structures, [10.1007/s10485-020-09605-x](#) *j/w Julia Ramos González*
- 2019 **Weak saturation and weak amalgamation property**,
Journal of Symbolic Logic, [10.1017/jsl.2019.45](#)
- 2018 **Homotopical Algebra is not concrete**,
Journal of Homotopy and Related Structures, [10.1007/s40062-018-0197-3](#) *j/w Fosco Loregian*

Preprints

- 2024 **Topoi with enough points**,
[arXiv:2403.15338](#). Submitted to Documenta Mathematica. *j/w Rogers*
- 2024 **Sketches and Classifying Logoi**,
[arXiv:2403.09264](#). Submitted to Advances in Mathematics. *j/w Lobbia*
- 2022 **Bi-accessible and bipresentable 2-categories**,
[arXiv:2203.07046](#). Submitted to Applied Categorical Structures. *j/w Axel Osmond*

Teaching

- 2024 **Model Theory**,
Lecturer, Master in Logic, Gothenburg University, Gothenburg, Sweden.
- 2024 **Category Theory**,
Lecturer, Master in Logic, Gothenburg University, Gothenburg, Sweden.
- 2024 **Functorial Semantics**,
Lecturer, Master in Logic, Gothenburg University, Gothenburg, Sweden.
- 2024 **Introduction to Topos Theory**,
Lecturer, PhD course, Gothenburg University, Gothenburg, Sweden.
- 2023 **Categorical Logic**,
Lecturer, PhD course, Stockholm University, Stockholm, Sweden.
- 2021 **Sheaves, Manifolds and Cohomology**,
Lecturer, Master in Mathematics, Charles University, Prague, Czechia. *j/w Andrea Gagna*

- 2020 **Category Theory**,
Lecturer, Excellence course for researchers, Institute of Mathematics, Czech Academy of Sciences, Prague, Czechia.
- 2020 **Topology**,
Teaching Assistant, Bachelor in Mathematics, Masaryk University, Brno, Czechia.
- 2019 **Topics in Category Theory**, j/w John Bourke
Lecturer, Master in Mathematics, Masaryk University, Brno, Czechia.
- 2019 **Topology**,
Teaching Assistant, Bachelor in Mathematics, Masaryk University, Brno, Czechia.
- 2018 **Topics in Category Theory**, j/w John Bourke
Lecturer, Master in Mathematics, Masaryk University, Brno, Czechia.
- 2017 **Rings and Modules**,
Teaching Assistant, Bachelor in Mathematics, Masaryk University, Brno, Czechia.

Supervision

PhD students,

- [Errol Yuksel](#): supervision for a project on topos-theoretic Galois theory, Stockholm University.

Master students,

- [Fabian Ruch](#), General theory of Kan extensions and Kan lifts in the bicategory of Topoi. MSc (Logic). Gothenburg University. Ongoing.
- [Guido Boccali](#), Classifying topoi, generic semantics, and Morita theory. MSc (Philosophy). University of Torino. Ongoing.

Bachelor students,

- [Vít Jelínek](#): Categorical View of Monads in Computer Science, Computer Science, Masaryk University.
- [Kento Okura](#): Sheaf Semantics over the Étale Site, Mathematics, Vienna University.
- [Alexander Lind](#): Semantics for relevance logics, Mathematics, Stockholm University cosupervised with Peter Lumsdane.
- [Jonathan Osser](#): Exploring the Mathematical Multiverse, a brief overview of Elementary Topoi and their Internal Language, Mathematics, Stockholm University cosupervised with Anders Mortberg.

Other forms of supervision,

- [Lingyuan Ye](#): project for his Master studies on Givant categoricity theorem. MSc (M). Institute of Logic, Language and Computation, Amsterdam.

SIGPLAN long-term mentorship program,

The [SIGPLAN long-term mentorship program](#) helps junior researchers and master students to form long-term connections in the programming languages community, and to access the perspectives of researchers from other institutions. Since Summer 2021 I am mentor in this project. I have 3 mentees.

Organising roles and Scientific Committees

Logic Colloquium 2024, Organising Committee,

Member of the Organising Committee of the [Logic Colloquium](#).

ItaCa Fest, Scientific Committee,

[ItaCa Fest](#) is permanent online seminar of the Italian community of category theory. Since 2020 I am a member of the [Scientific Committee](#) that organizes the Fest. More information about my relationship with ItaCa is available in the Community section of the CV.

Bohemian Logical & Philosophical Café, Founder, Scientific committee and Coordinator,

Since my arrival at the Maths Institute of the Czech Academy of Sciences I promoted and I have been the general coordinator of a new initiative of webinars in emerging topics in logic. The project has a quite broad scope and is willing to encompass a variety of subjects: theoretical computer science, category theory, mathematical logic, and philosophy. More information is available [here](#).

Masaryk University Algebra Webinar, Founder and main organizer until July 2020,

During pandemics I promoted to transform the local Algebra permanent seminar of Masaryk University into a permanent webinar. Especially at the beginning the whole organization was upon myself, many of the first speakers were directly suggested by me. I maintained the webpage and the youtube channel until the end of my PhD studied. Nowadays the [webpage](#) and [youtube channel](#) are maintained by John Bourke.

Peripatetic Seminar on Sheaves and Logic 103, Promoter and Coordinator,

PSSL103 is a Peripatetic event in Categorical Logic. During my first year of PhD (2018) I promoted an instance of this tradition in Masaryk University. Having the approval of my advisor and Peter Johnstone, I was in charge of the organization. I coordinated the effort of other researchers, such as John Bourke, Simon Henry, Fosco Loregian and Micheal Lieberman. The webpage of the event is not online anymore, but the event is listed in [this webpage](#).

Community

ItaCa, Promoting Committee,

ItaCa is the Italian community of category theory. The project was founded by Giuseppe Metere in 2019. I was invited by Andrea Montoli to join the Programme committee of ItaCa 1, the first official meeting of the community. The event took place at the University of Milano, the webpage of the event is still available [at this link](#). Since this invitation I have been an active member of ItaCa. In the same year I was invited to join the Program Committee of ItaCa Fest. ItaCa Fest is a webinar aimed to gather the community of ItaCa. Click [here](#) to visit the webpage of the Fest. Since January 2021 I am one of the members of the **Promoting Committee**, this is the coordinating committee of the entire project.

Referee,

I was a referee for [Journal of Pure and Applied Algebra](#), [Canadian Journal of Mathematics](#), [Theory and Applications of Categories](#), [Applied Categorical Structures](#), [Compositionality](#), [Symposium on Logic in Computer Science](#), [Conference on Mathematical Foundations of Programming Semantics](#), [International Conference on Formal Structures for Computation and Deduction](#).

MathOverflow, top 5 % user,

MathOverflow is a mathematics question-and-answer (Q&A) website, which serves as an online community of researchers in mathematics. It allows users to ask questions, submit answers, and rate both, all while getting merit points for their activities. It is a part of the Stack Exchange Network and has an internal rating system based on the reputation gained by the users within the website. [Here](#) is my profile webpage.

Invited Visits

- 2024 **Tallinn University of Technology, Tallin,**
Collaboration with Loregian and Arkor.
- 2024 **University of Bologna, Bologna,**
Invited speaker at local research seminar by Martino Lupini. [Cancelled because of health issues.](#)
- 2022 **Manchester University, Manchester,**
Collaboration with Nicola Gambino.
- 2022 **Université catholique de Louvain, Louvain,**
Collaboration with Julia Ramos Gonzalez.
- 2022 **Université Paris Nord, Paris,**
Collaboration with Morhan Rogers.
- 2021 **Institute de recherche et informatique fondamentale (IRIF), Paris,**
Collaboration with prof. Paul-André Mellies and Axel Osmond.
- 2019 **Institute de recherche et informatique fondamentale (IRIF), Paris,**
Collaboration with prof. Sam van Gool.
- 2019 **Antwerp University,**
Collaboration with Julia Ramos Gonzalez.
- 2018 **Max Plank Institute, Bonn,**
Collaboration with Fosco Loregian.

Selected Invited Talks

- 2024 **TBA,**
Categorical Logic and Higher Categories, Manchester, UK.
- 2023 **2-Sketches of Deduction,**
Category Theory at Work in Computational Mathematics and Theoretical Informatics, Bergen, Norway.
- 2022 **The geometry of coherent topoi and ultrastructures,**
Invited speaker, YaMCATS, Manchester, UK.
- 2022 **Bi-accessible and bipresentable 2-categories,**
Invited speaker, WG6 kick-off meeting: Syntax and Semantics of Type Theories, Stockholm, Sweden.
- 2021 **Formal Model Theory and Higher Topology,**
Seminar Lecture, Yorkshire and Midlands Category Theory Seminar (YaMCATS), online.
- 2020 **Formal Model Theory and Higher Topology,**
HoTT Seminar, Carnegie Mellon University, Pittsburgh, USA.
- 2019 **Topos theoretic approaches to formal model theory,**
Seminar Lecture, Institute de recherche et informatique fondamentale, Paris, France.
- 2018 **The shape of water: Homotopical algebra and set functors,**
Seminar Lecture, Max Plank institut, Bonn, Germany.

Selected Talks at conferences

- 2024 **Topoi with enough points**,
University of Gothenburg, Logic Colloquium 2024.
- 2023 **The geometry of coherent topoi & ultrastructures**,
UCLouvain, CT2023.
- 2022 **Bi-accessible and bipresentable 2-categories**,
Masaryk University, Peripatetic Seminar on Sheaves and Logic 106.
- 2021 **Givant, Morley, Zilber**,
University of Genova, ItaCa21.
- 2021 **Enriched Locally Generated Categories**,
University of Genova, Category Theory 2020->2021.
- 2021 **Formal Model Theory and Higher Topology**,
Online, Logic Colloquium 2021.
- 2021 **Towards higher Topology**,
Online, Toposes Online.
- 2019 **The Scott Adjunction**,
University of Edinburgh, Category Theory 2019.
- 2018 **An axiomatic approach to Gabriel Ulmer duality**,
University of Azores, Category Theory 2018.
- 2017 **Weak saturation and weak amalgamation property**,
University of Leeds, Peripatetic Seminar on Sheaves and Logic 101.

Administrative Duties

Member of the Postgraduate Education Group (FUG) at Gothenburg University,

The Postgraduate Education Group (FUG) is an advisory body for postgraduate (third cycle) education at the department. FUG consists of representatives of the active supervisory boards, two representatives of the doctoral student board, and the responsible education administrator. Representatives are appointed by the Associate Head of Department for Doctoral Studies.

Thesis Reader (Granskare) at Stockholm University,

Stockholm University evaluation process for Bachelor and Master thesis is based on a double review system. A part of the evaluation comes from an opponent and another one comes from a reader (granskare). The granskare must assess whether the thesis is solid enough to be defended. During my stay in Stockholm I was granskare few times. 2022: Thea Li, The internal logic of a topos. 2023: Caroline Roos, Agda formalization of Lindenbaum-Tarski algebras.

Thesis Reader at Masaryk University,

Masaryk University evaluation process for Bachelor and Master thesis is based on a double review system. One review comes from the advisor of the student and another one comes from an internal opponent. Both the reviews must describe, discuss and finally score the thesis from A to F. During my PhD studies I was three times opponent for bachelor theses. 2019: Yuriy Dupyn, Algebraic Structures. 2018: Jan Jurka, Locally presentable categories. 2018: Vladislav Demenchuk, Elements of nonstandard analysis.