Nicola Di Vittorio

▬ Education

March 2025 (awarded) **Ph.D. in Mathematics**, *Macquarie University*, Sydney,
Thesis: Higher derivators as a foundation for ∞-category theory.

2021 **M.Res. in Mathematics**, *Macquarie University*, Sydney,
Thesis: 2-derivators.

2019 **M.Sc. in Mathematics**, *Università di Padova*, Padova (Italy),
Thesis: On the embeddings of quasi-categories into prederivators.

2017 **B.Sc. in Mathematics**, *Università di Bari*, Bari (Italy),
Thesis: Brown's theorem for triangulated categories (*in Italian*).
From 2013 to 2015 I was enrolled in the University of Pisa (Italy), where I attended the courses offered in the first two years of their Bachelor degree in Mathematics.

▬ Research articles

Publications

2025 **Towards 2-derivators for formal ∞-category theory**, *accepted for publication by* Advances in Mathematics, preprint available at arXiv: 2309.05216.

2023 **A Gray-categorical pasting theorem**, Theory and Applications of Categories, Vol. 39, 2023, No. 5, pp 150-171.

Preprints

2023 **Some remarks on the interchange in Gray-categories**, *with Gabriele Lobbia*, arXiv: 2310.03503. Submitted.

▬ Invited visits

Apr 2025 **Research Institute for Mathematical Sciences**, *Kyoto*, to visit Dr. Yuki Maehara.

Apr-May 2024 **Australian National University**, *Canberra*, to visit Prof. Dominic Verity.

Nov 2023 **University of Melbourne**, to visit Prof. Marcy Robertson.

July 2023 **University of Manchester**, to visit Prof. Nicola Gambino.

June 2023 **Masaryk University**, *Brno (Czechia)*, to visit Prof. John Bourke.

Dec 2019 **Macquarie University**, *Sydney*, Visiting Scholar under the supervision of Prof. Dominic Verity.

Nov 2018, Feb-Mar 2019 **Université catholique de Louvain**, *Louvain-la-Neuve (Belgium)*, to visit Prof. Tim Van der Linden.

Awards

2025	Australian Mathematical Society's Lift-off Fellowship.
	Awarded annually to PhD graduates in Mathematics based on academic merit, this grant supports their early-career research and development.
2023	Macquarie University Postgraduate Research Fund (PGRF) with Deputy Vice-Chancellor (Research) Commendation.
	A$ 5,000 (plus a 10% bonus for the outstanding nature of my application) Travel Grant to conduct research and present my work overseas. Overall I managed to obtain circa A$ 12,000 from different sources to finance a two-month research period in Europe.
2021	Executive Dean's Commendation for Academic Excellence in Year 2 Master of Research.
	Awarded to candidates who have demonstrated exceptional performance in Year 2 of the Master of Research.
2020	International Macquarie University Research Excellence Scholarship (iMQRES).
	Full scholarship to cover all the fees of the Master of Research and PhD programs plus a living allowance.
2019	Funding from Coimbra Group to support a two-month exchange at the Université Catholique de Louvain in Belgium during my Master's.

Over the years I've been awarded funding by different organisations to attend a number of conferences across Europe and Australia. On the basis of my exceptional High School performance, I've also won a €5,000 scholarship awarded by the Italian Ministry of Education to support my Bachelor's studies in Pisa.

Service

2022	**Categories and Companions Symposium 2022 (CaCS 2022),** *Organiser.* The second edition of CaCS, hybrid event held online and in Creswick, Victoria (AU).
2021	**Australian Kittens 2021: A Meeting of Early Career Researchers in Category Theory and Homotopy Theory,** *Part of the scientific committee.* Two-day virtual conference consisting of a series of contributed talks from Australian graduate students and postdocs, virtual/hybrid social events, career advice and mentoring activities.
2021	**Categories and Companions Symposium 2021 (CaCS 2021),** *Organiser.* A week-long online event for research students in category theory and related disciplines from around the world to meet each other and share their work. It comprises invited talks delivered by established academics and several contributed talks by Ph.D. students.

CaCS2021 and CaCS2022 have been funded by Matrix and AMSI on the basis of successful proposals that I co-wrote.

Teaching

I've been tutoring the following courses aimed at Macquarie University's undergraduate students.

o Discrete Mathematics I and II
   Some of the topics covered: graph algorithms, boolean algebra, combinatorics, network flows, regular languages and Turing machines.

- Calculus and Linear Algebra I (Advanced) and II
  Some of the topics covered: inverse matrices, determinants, eigenvalues and eigenvectors, numerical integration, differential equations.

- Applied Statistics
  Some of the topics covered: t-tests, ANOVA, linear regression, statistical analysis with R.

- Vector Calculus and Complex Analysis.
  Some of the topics covered: Vector fields in 2D and 3D, Green's theorem, Stokes' theorem, Gauss' theorem, Single-variable complex functions, Cauchy's theorem, Contour integrals, Residue theorem.

Invited Talks

Dec 2025	*Towards 2-derivators for formal ∞-category theory*, Algebra Seminar, Charles University (Prague, CZ)
Apr 2025	*2-derivators: two different takes*, Research Institute for Mathematical Sciences, Kyoto University (JP)
Nov 2023	*2-derivators*, Homotopy Theory seminar, University of Melbourne (AU)
Jul 2023	*Pasting in Gray-categories*, Department of Mathematics, University of Manchester (UK)
29 Jun 2023	*An introduction to 2-derivators*, Institute of Mathematics of the Czech Academy of Sciences (Prague, CZ).
15 Jun 2023	*Introduction to the theory of 2-derivators*, Masaryk University Algebra Seminar, Masaryk University (Brno, CZ).
22 Nov 2022	*A gentle introduction to 2-derivators*, ItaCa Fest 2022

Contributed Talks

Dec 2023	*Introduction to the theory of 2-derivators*, AustMS 2023
July 2023	*Beck's monadicity in a 2-derivator*, Université catholique de Louvain (Louvain-la-Neuve, Belgium), Poster presentation at the CT2023.
February 2022	*A **Gray**-categorical pasting theorem*, Australian Category Seminar (Macquarie University).
June 2021	*2-derivators*, Australian Category Seminar (Macquarie University).

Conferences and Schools attended

Dec 2023	**The 67th Annual Meeting of the Australian Mathematical Society (AustMS 2023)**, *University of Queensland*, Brisbane.
Nov 2023	**Rough Path Theory 2023**, *MATRIX Institute*, Creswick.
Nov 2023	**7th Australian Algebra Conference**, *Monash University*, Melbourne.
July 2023	**International Category Theory Conference 2023**, *Université catholique de Louvain*.
May 2019	**PSSL 105**, *Università di Palermo*.
April 2019	**Workshop on Derivators**, *Universität Regensburg*.
March 2019	**Séminaire Itinérant de Catégories**, *Université catholique de Louvain*.
June 2018	**Toposes in Como School**, *Università degli Studi dell'Insubria*.

Computer Skills

Languages	LaTeX, C, Python, HTML, MATLAB, R
Platforms	Microsoft, Linux

Languages

Italian	Native
English	C1+, IELTS 8.0 (2025)