

# Isabel Longbottom

CONTACT: ilongbottom (at) math (dot) harvard (dot) edu

## RESEARCH INTERESTS

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I am interested in homotopy theory, algebraic K-theory, and algebraic geometry.

## EDUCATION

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| 2022-27 (expected) | PhD in Mathematics, supervised by Michael Hopkins<br><b>Harvard University</b><br>MA in mathematics, November 2023   |
| 2018-21            | Bachelor of Philosophy - Science (Honours), Mathematics major, CS minor<br><b>The Australian National University</b><br>GPA of 7.00 (out of 7.00), First Class Honours |

## PAPERS

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- SEPTEMBER 2025    *A strong finiteness condition for smashing localisations.* [arXiv:2509.07344](#).

## AWARDS AND SCHOLARSHIPS

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| 2023-24   | Raphael and Daniel Salem Fellowship, Harvard                               |
| 2022      | Attended the IAS/PCMI Undergraduate Summer School                          |
| 2020      | Alan McIntosh Prize for third year Mathematics, ANU                        |
| 2020      | Hanna Neumann Prize for third year mathematics, ANU                        |
| 2020      | Priscilla Fairfield Bok Prize for women in third year science courses, ANU |
| 2020      | Invited to the IAS/PCMI Undergraduate Summer School subsequently cancelled |
| 2019      | Hanna Neumann Prize for second year mathematics, ANU                       |
| 2019      | Priscilla Fairfield Bok Prize for women in third year science courses, ANU |
| 2018      | Hanna Neumann Prize for first year mathematics, ANU                        |
| 2018      | Mavis Prater Prize for women in mathematics, ANU                           |
| JULY 2017 | Tuckwell Scholarship for an undergraduate degree at the ANU                |

## COMPUTER SKILLS

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(alphabetically) Ada, Haskell, Java,  $\LaTeX$ , Lean, Macaulay2, Magma, Python, Sage

## TALKS

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| NOVEMBER 2025  | <i>Norm varieties and Rost varieties.</i> Harvard Juvitop Seminar.                      |
| OCTOBER 2025   | <i>Compactly central localisations in spectra and beyond.</i> Harvard Zygotop Seminar.  |
| APRIL 2025     | <i>Trivial problems and mathematical trivia.</i> Harvard Trivial Notions Seminar.       |
| APRIL 2025     | <i>Notions of finiteness for localisations.</i> Harvard Zygotop Seminar.                |
| SEPTEMBER 2024 | <i>Intro to equivariant homotopy theory.</i> Harvard Babytop Seminar.                   |
| AUGUST 2024    | <i>Cyclotomic Frobenius and the Segal conjecture.</i> MIT Talbot workshop.              |
| APRIL 2024     | <i>Rational homotopy of the <math>K(n)</math>-local sphere.</i> MIT Babytop seminar.    |
| APRIL 2024     | <i>The Hopf invariant one problem.</i> Harvard Zygotop seminar.                         |
| FEBRUARY 2024  | <i>K-theory of the <math>K(1)</math>-local sphere via TC.</i> Harvard Thursday seminar. |
| NOVEMBER 2023  | <i>Sylow Theorems for Infinity Groups.</i> Harvard Trivial Notions seminar.             |
| OCTOBER 2023   | <i>K-theory from the ground up.</i> Harvard Zygotop seminar.                            |
| MAY 2023       | <i>On the K-theory of pullbacks and pushouts.</i> Harvard Zygotop seminar.              |
| MARCH 2023     | <i>Abouzaid-Blumberg flow categories.</i> MIT Juvitop seminar.                          |
| NOVEMBER 2022  | <i>A proof of the Pontryagin-Thom theorem.</i> MIT Kan seminar.                         |
| OCTOBER 2022   | <i>On the cobordism ring and a complex analogue, after Milnor.</i> MIT Kan seminar.     |

## EMPLOYMENT

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FALL 2025	<b>Pedagogy Fellow for MATH300, Harvard</b> Assisted in running the theory course all incoming graduate students in math must take to prepare them to teach at Harvard.
FALL 2023, FALL 2024	<b>Teaching Fellow for MATH1B, Harvard</b> Delivered thrice-weekly calculus classes, helped write and mark exams, gave office hours.
2020, 2021	<b>Demonstrator for MATH1115, MATH1116, MATH2222, and MATH2322, ANU</b> Ran (online and in-person) workshops, marked assignments and exams. TA-equivalent position.
2019	<b>Drop-in tutor, ANU</b> Drop-in tutor for first year courses during the exam preparation period.
2019	<b>Peer-Assisted Learning Mentor for MATH1115 and MATH1116, ANU</b> Junior TA position as a second-year teaching first-year students analysis and linear algebra.

## SERVICE

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SPRING & FALL 2024	<b>Organiser for the ZYGOTOP SEMINAR, Harvard</b> Learning seminar for young graduate students in algebraic topology.
2023-25	<b>Organiser for REAL REPRESENTATIONS, Harvard</b> Support for underrepresented groups in math. Helped run social lunches and two trivia nights.
JANUARY 2020, 2021, 2022	<b>Tutor at THE NATIONAL MATHS SUMMER SCHOOL, Canberra</b> Tutored at a two-week-long summer program for mathematically able high school students.
DECEMBER 2020	<b>Maths tutor for the CURIOUS MINDS STEM PROGRAM, Online</b> Ran maths problem-solving sessions for rural female-identifying high school students.
2020	<b>Vice President of the ANU MATHEMATICS SOCIETY</b>