Christian Carrick

Curriculum Vitae

PERSONAL DETAILS

Mail c.d.carrick@uu.nl

Research Algebraic Topology: Equivariant homotopy theory, chromatic homotopy theory, synthetic spectra, higher real K-theories, stacks

POSITIONS AND EDUCATION

NSF Postdoctoral Fellow June 2024-

Utrecht Geometry Center, Universiteit Utrecht

Supervisor: Lennart Meier.

Postdoctoral Researcher (Onderzoeker) Jan 2023-May 2024

Utrecht Geometry Center, Universiteit Utrecht

Supervisor: Lennart Meier.

Trimester Program Participant Sep 2022-Dec 2022

Hausdorff Institute of Mathematics, Bonn

Spectral Methods in Algebra, Geometry, and Topology

Ph.D. Mathematics Sep 2017-May 2022

UCLA

Advisor: Michael A. Hill. Dissertation: *Stacks and Real-Oriented Homotopy Theory.*

A.B. Mathematics 2012-2016

Harvard University

Magna Cum Laude. GPA: 3.85. Advisor: Michael J. Hopkins. Senior Thesis: *An Elementary Proof of Quillen's Theorem for Complex Cobordism.*

AWARDS AND HONORS

Pacific Journal of Mathematics Award

Award for 3 best dissertations in Mathematics at UCLA. Awarded $3500 June 2022.

UCLA Dissertation Year Fellow

Research fellowship for $20,000. Awarded for 2021-2022 academic year.

Harvard College Research Program Fellow

Research fellowship for $3000. Awarded Summer 2016.

Derek Bok Teaching Award

Award for outstanding teaching as a course assistant at Harvard University. Awarded Spring 2016 and Fall 2016.

Program for Research in Science and Engineering (PRISE) Fellow

Research fellowship at Harvard University for $3000. Awarded Summer 2015.

Northern California Scholarship Foundation (NCSF) Winner

Scholarship for $32000. Awarded Fall 2012.

PUBLICATIONS

The descent spectral sequence for topological modular forms
jt. with Jack Davies and Sven van Nigtevecht. Submitted

On MU homology of connective models of higher real K-theories
jt. with Mike Hill. Submitted

Nonvanishing of products in v_2 periodic families at the prime 3
jt. with Jack Davies. Submitted

Descent spectral sequences through synthetic spectra
jt. with Jack Davies and Sven van Nigtevecht. Submitted

Chromatic defect, Wood's theorem, and higher real K-theories
Submitted

A synthetic approach to detecting v_1 periodic families
jt. with Jack Davies. Submitted

The homological slice spectral sequence in motivic and Real bordism.
jt. with Mike Hill and Doug Ravenel. Advances in Mathematics, Volume 458, Part A, 2024.

Cofreeness in Real bordism theory and the Segal conjecture.
Proc. Am. Math. Soc., Volume 150(7), July 2022, 3161-3175.

Smashing localizations in equivariant stable homotopy
Journal of Homotopy and Related Structures, 17, 355-392 (2022).

INVITED TALKS

University of Bochum Topology Seminar

- *Chromatic defect, Wood's theorem, and higher real K-theories.* 11/2024

New Mexico Topology Seminar

- *Synthetic spectra and the image of J.* 3/2024

ECHT Online Research Seminar

- *Chromatic defect, Wood's theorem, and higher real K-theories.* 11/2023

University of Groningen

- *The Segal Conjecture and $\mathbb{F}_1$.* 10/2023

University of Bonn Topology Seminar

- *Chromatic defect, Wood's theorem, and higher real K-theories.* 10/2023

International Workshop on Algebraic Topology Beijing

- *Chromatic numbers and Real-oriented spectra.* 7/2023

Utrecht Geometry Center Seminar

- *The Segal Conjecture and $\mathbb{F}_1$.* 2/2023

UCSD Visiting Algebraic Topology Seminar

- *The Homology of $BP_{\mathbb{R}}\langle n\rangle$.* 3/2022

Chicagoland Algebraic Topology Seminar (University of Chicago)

- *The Segal conjecture and Real bordism theory.* 11/2021

AMS Fall Western Sectional Meeting (Special Session on Equivariant and Motivic Homotopy Theory)

- *The Segal conjecture and Real bordism theory.* 11/2021

UCLA Visiting Algebraic Topology Seminar

- *Smashing Localizations in Equivariant Stable Homotopy.* 10/2019

Chico Topology Conference (contributed)

- *A new proof of the Segal conjecture via Real bordism theory.* 4/2022

SERVICE

TopICS Intercity Topology Seminar
Organized a monthly invited seminar joint with Universiteit Utrecht, Universiteit Radboud, and Vrije Universiteit Amsterdam. Fall 2023, Spring 2024.

ssplot.netlify.app
I developed and maintain a website to display and manipulate spectral sequence diagrams automatically using output from Macaulay2. From Spring 2021.

UCLA Directed Research Program (DRP) Mentor
Mentored undergraduates on chromatic homotopy theory. Winter 2021, Spring 2021.

UCLA Participating Algebraic Topology Seminar Organizer
Organized seminars on Higher Real K-theories in Fall 2020, on Stacks in Winter 2020, and on Motivic Homotopy in Fall 2021.

UCLA Juvitop Seminar Founder and Organizer
Founded the UCLA Juvitop Seminar in Fall 2018. Organized seminars on Structured Ring Spectra in Winter 2019 and on Computations in Chromatic Homotopy in Fall 2018.

Harvard College Tutoring Programs
Tutored High School Students in the Cambridge After School Program and the CHANCE tutoring program. Fall 2015 thru Spring 2016.

TEACHING/ADVISING EXPERIENCE

Instructor 2023-Present
Universiteit Utrecht

- **Advised Bachelor's theses:** Chris Vos and Jacco Hijmans, Spring 2024. I advised a joint bachelor's thesis on the Adams spectral sequence and Ext over the Steenrod algebra. Students also created highly flexible and sophisticated Ext resolution software.
- **Advised Master's thesis** Luca Dal Forno, Spring 2024. I advised a master's thesis on Day Convolution for equivariant ∞-operads.
- **Master's seminar:** Topological K-theory, Spring 2024.
- **Orientation to Mathematical Research (OMR)** Abelian and derived categories, Winter 2024. I advised four Master's students on a research project related in homological algebra.

Teaching Assistant 2017-2022
UCLA Department of Mathematics

- **Math 33a:** Linear Algebra, Winter 2021.
- **Math 31b:** Calculus II, Winter 2021, Fall 2020, Spring 2020, Winter 2020, Spring 2019, Winter 2019, Fall 2018.
- **Math 31a:** Calculus I, Fall 2020, Fall 2019, Spring 2019, Winter 2019, Fall 2018.
- **Math 32b:** Multivariable Calculus II, Summer 2020, Winter 2020, Summer 2019, Spring 2018.
- **Math 32a:** Multivariable Calculus I, Winter 2018.
- **Math 1a:** Precalculus, Fall 2017.

Course Assistant 2016

Harvard University Department of Mathematics

- **Math 131:** Topology, Fall 2016. Derek Bok Teaching Award.
- **Math 101:** Sets, Groups, and Topology, Spring 2016. Derek Bok Teaching Award.
- **Math 101:** Sets, Groups, and Topology, Fall 2016