

## John E. Harper

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## Short Mathematical Biography

My mathematical career began while I was in graduate school at **MIT** for a period of 6 years (1996–2002). I started out studying aeronautics and astronautics, which I enjoyed immensely: during a simultaneous immersion into a long sequence of pure mathematics courses—undergraduate and then graduate level—at MIT, as I became aware of more mathematics, my interests evolved in the direction of algebraic topology and homotopy theory. **Haynes Miller** took an interest and graciously pointed me in the direction of Bill Dwyer. That summer I packed up and was off to South Bend, Indiana. Under the thesis guidance of **Bill Dwyer**, I received my PhD in mathematics at the **University of Notre Dame** (2003–2008). From 2008 to 2010 I had a postdoctoral position at **EPFL** (Switzerland) to work with **Kathryn Hess**. I then obtained a postdoctoral position at the **University of Western Ontario** (Canada), where I remained from 2010 to 2012, working with **Rick Jardine**. I spent the 2012–2013 academic year as a visiting assistant professor at **Purdue University**, working with **Jim McClure**. In the fall of 2013 I began my current position, starting out as an assistant professor, and continuing as an associate professor (since the summer of 2019). I live in Upper Arlington, Ohio, 10 minutes from the Columbus campus (where I work with graduate students) and 35 minutes from the Newark campus (where I work with undergraduate students).

## PhD Students

Note: Further details are elaborated below in the section on mentoring (e.g., official mentoring dates).

**Oleksii Nikitchenko**, The Ohio State University—PhD in Mathematics: May 2028 (expected)

**Matthew Carr**, The Ohio State University—PhD in Mathematics: May 2023

Thesis: *Retractive operadic algebras in spectra and completions*.

**Duncan A. Clark**, The Ohio State University—PhD in Mathematics: May 2021

Thesis: *An operad structure for the Goodwillie derivatives of the identity functor in structured ring spectra*.

**Nikolas Schonsheck**, The Ohio State University—PhD in Mathematics: May 2021

Thesis: *Fibration theorems and the Taylor tower of the identity for spectral operadic algebras*.

**Yu Zhang**, The Ohio State University—PhD in Mathematics: May 2020

Thesis: *Topological Quillen localization and homotopy pro-nilpotent structured ring spectra*.

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Note: No doctoral students above this line had graduated before my 2018 promotion-to-tenure case; i.e., my 6th-year-review dossier was finalized and submitted to the mathematics department on 09/16/2018.

**Jacobson R. Blomquist**, The Ohio State University—PhD in Mathematics: May 2018

Thesis: *Iterated desuspension and delooping of structured ring spectra*.

## Research Grants

### 2019–2024: Simons Foundation: Collaboration Grants for Mathematicians

Principal Investigator: John E. Harper  
Project Title: Functor calculus and localization  
Institution: The Ohio State University  
Award Number: 638247  
Total Award: \$42,000  
Dates: 09/2019 – 08/2024

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Note: No grants awarded above this line were available for my 2018 promotion-to-tenure case; i.e., my 6th-year-review dossier was finalized and submitted to the mathematics department on 09/16/2018.

## Editor for

**Advanced Studies: Euro-Tbilisi Mathematical Journal (ASETMJ)** (formerly TMJ) (Sept. 2021–present)

This is a relatively new fully refereed international mathematical journal accepting original high-quality research papers in all areas of mathematics; we particularly encourage innovative papers which point the way towards new applications for the development of pure and applied mathematics. ASETMJ is supported by the Georgian National Academy of Sciences and by the European Mathematical Society. It is electronically handled by Project Euclid of Cornell University Library and Duke University Press, and is published by the Tbilisi Centre for Mathematical Sciences (TCMS), a non-governmental and non-profit independent academic institution founded in 2008. TCMS also publishes another mathematical journal, Journal of Homotopy and Related Structures (JHRS), printed by Springer.

Editorial interests: *homotopy theory, algebraic topology, structured ring spectra, functor calculus, algebras over operads*

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Note: No editorial work above this line was available for my 2018 promotion-to-tenure case; i.e., my 6th-year-review dossier was finalized and submitted to the mathematics department on 09/16/2018.

**Tbilisi Mathematical Journal (TMJ)** (Nov. 2015–Sept. 2021)

## Special Issue Editorial Work

**2020: Lead editor for TMJ: Special Issue on Homotopy Theory, Spectra, and Structured Ring Spectra**

I was the lead editor for this special issue of the Tbilisi Mathematical Journal (TMJ). Initial announcements went out in 2019, and most of the work was done in 2020. It involved inviting a 7-member team of guest editors, communicating with the guest editors, and resolving questions of submission authors. Special issue editorial board: (1) Greg Arone (Stockholm), (2) David Barnes (Queen's University, Belfast), (3) Mark Behrens (Notre Dame), (4) John E. Harper (OSU), (5) Kathryn Lesh (Union), (6) Cary Malkiewich (Binghamton), (7) Dan Ramras (IUPUI), (8) Kirsten Wickelgren (Duke). This special issue of TMJ was intended to be general enough for a wide range of papers in homotopy theory, broadly interpreted, in addition to papers that have some connection to spectra or structured ring spectra.

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Note: No special issue editorial work above this line was available for my 2018 promotion-to-tenure case; i.e., my 6th-year-review dossier was finalized and submitted to the mathematics department on 09/16/2018.

## Education and Employment

**Associate Professor** (2019–present)

Department of Mathematics, The Ohio State University, Newark

**Assistant Professor** (2013–2019)

Department of Mathematics, The Ohio State University, Newark

**Visiting Assistant Professor** (2012–2013)

Department of Mathematics, Purdue University

VAP sponsor: **J.E. McClure**

**Postdoctoral Fellow** (2010–2012)

Department of Mathematics, University of Western Ontario, Canada

Postdoctoral sponsor: **J.F. Jardine**

**Postdoctoral Fellow** (2008–2010)

Institut de Géométrie, Algèbre et Topologie, EPFL, Switzerland

Postdoctoral sponsor: **K. Hess**

**University of Notre Dame** (2003–2008)

Ph.D. in Mathematics, May 2008

Thesis advisor: **W.G. Dwyer**

Before committing full time to mathematics in 2003, I had studied aeronautics and astronautics at **MIT** and **RPI**:

**Massachusetts Institute of Technology** (1999–2002)  
Doctoral Graduate Student in Aeronautics and Astronautics

**Massachusetts Institute of Technology** (1996–1999)  
S.M. in Aeronautics and Astronautics, June 1999

**Rensselaer Polytechnic Institute**  
B.S. in Aeronautical Engineering, December 1995, *Magna Cum Laude*

## Research Interests

The areas I am interested in are homotopy theory and algebraic topology, and their interactions with closely related areas in mathematics; e.g., algebraic  $K$ -theory, algebraic number theory, algebraic geometry, homological algebra, and geometric topology.

## Preprints

**Functor calculus completions away from the null object and retractive operadic algebras.**  
(with M.B. Carr). In preparation.

Note: In this paper we generalize earlier results from Ching-Harper and Blomquist to the setting of retractive algebras over an operad  $O$  in spectra; i.e.,  $O$ -algebras  $X$  that factor the identity map on a fixed  $O$ -algebra  $Y$ . This setting naturally arises by considering Goodwillie's Taylor tower constructions centered not on the null object, but on a fixed  $O$ -algebra  $Y$ .

**Fracture squares and completion for TQ-homology with coefficients.**  
(with C. Ogle and Y. Zhang). In preparation.

Note: In this paper we study completion of TQ-homology with coefficients; one upshot of our results is that such completions fit into fracture squares (this is essentially a rational result, due to the assumption that the coefficients are homotopically solid commutative ring spectra).

**Simplicial homotopy theory, completions, and homotopy functor calculus**  
(with J.R. Blomquist and D.A. Clark). In preparation.

Note: This is a research monograph introducing simplicial homotopy theory ideas with the aim of quickly getting to some recently developed results and techniques, while at the same time covering certain interesting aspects of the theory. It is intended for beginning graduate students in mathematics, advanced undergraduate students, and other interested researchers who would like to more deeply understand certain ideas and constructions that have been useful in simplicial homotopy theory. It is not intended to be a comprehensive reference, but rather to provide a springboard towards some related research literature and monographs. The reader's intended purpose will be to learn how to think and do simplicial homotopy theory at a sufficiently deep level of understanding to enable the creation of new results in mathematics—the guiding path of the book will be a focus on certain aspects of completions and homotopy functor calculus in a few settings and examples that have been of interest to us.

**Ring spectra, abelianization, and the density argument.**  
(with J. Blomquist and C. Ogle). In preparation.

Note: In this short paper, we identify bounded below ring spectra with coalgebras over the abelianization of spaces comonad, and is closely related to the Blomquist-Harper paper on the integral chains problem. It is essentially a spinoff of a technical idea exploited in the monograph of Dundas-Goodwillie-McCarthy.

## Publications

**Higher stabilization and higher Freudenthal suspension.**  
(with J.R. Blomquist). Trans. Amer. Math. Soc. 375(11):8193–8240, 2022.

**Topological Quillen localization of structured ring spectra.**  
(with Y. Zhang). Tbilisi Math. J., 12(3):69–91, 2019.

**Derived Koszul duality and TQ-homology completion of structured ring spectra.**  
(with M. Ching). Adv. Math., 341:118–187, 2019.

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Note: No accepted publications above this line were available for my 2018 promotion-to-tenure case; i.e., my 6th-year-review dossier was finalized and submitted to the mathematics department on 09/16/2018. In more detail, no

publications above this line had the status of accepted or to appear when the CENT DB meeting/vote for tenure-track candidates happened on 9 October 2018. The “Integral chains ...” paper below had the status of to appear before the CENT DB meeting, the “Derived Koszul ...” paper above was accepted on 15 October 2018, the “Topological Quillen ...” paper above was accepted on 22 July 2019, and the “Higher stabilization ...” paper above was accepted on 14 June 2022; no publications above this line were available to outside letter writers as accepted or to appear for my 2018 promotion-to-tenure case.

**Integral chains and Bousfield-Kan completion.**

(with J.R. Blomquist). *Homology Homotopy Appl.* 21(2):29–58, 2019.

**A nilpotent Whitehead theorem for TQ-homology of structured ring spectra.**

(with M. Ching). *Tbilisi Math. J.*, 11(3):69–79, 2018.

**Higher homotopy excision and Blakers–Massey theorems for structured ring spectra.**

(with M. Ching). *Adv. Math.*, 298:654–692, 2016.

**Corrigendum to “Homotopy theory of modules over operads in symmetric spectra”.**

*Algebr. Geom. Topol.*, 15(2):1229–1237, 2015.

**Homotopy completion and topological Quillen homology of structured ring spectra.**

(with K. Hess). *Geom. Topol.*, 17(3):1325–1416, 2013.

**Bar constructions and Quillen homology of modules over operads.**

*Algebr. Geom. Topol.*, 10(1):87–136, 2010.

**Homotopy theory of modules over operads and non- $\Sigma$  operads in monoidal model categories.**

*J. Pure Appl. Algebra*, 214(8):1407–1434, 2010.

**Homotopy theory of modules over operads in symmetric spectra.**

*Algebr. Geom. Topol.*, 9(3):1637–1680, 2009. Corrigendum.

## Research Visits

**University of Bergen, Norway**, Department of Mathematics, April–May 2015. Invited by B. Dundas.

**Massachusetts Institute of Technology**, Department of Mathematics, January–February 2015. Invited by H.R. Miller.

**Massachusetts Institute of Technology**, Department of Mathematics, July–August 2011. Invited by M. Behrens and H.R. Miller.

**Universität Bonn**, Mathematisches Institut, June–July 2010. Invited by J. Hornbostel and S. Schwede.

**Fields Institute for Research in Mathematical Science, Toronto**, May–June 2007. Thematic Program on Geometric Applications of Homotopy Theory. Invited by the organizers: G. Carlsson, D. Christensen, and J.F. Jardine.

**Hebrew University of Jerusalem**, Einstein Institute of Mathematics, March–April 2006. Invited by E. Dror Farjoun.

## Mentoring: PhD Students (OSU)

### Oleksii Nikitchenko

Mentoring Dates: 08/2023 – 05/2028 (expected)

Degree/Department/Institution: PhD/Mathematics/OSU

### Matthew Carr

Mentoring Dates: 02/2019 – 05/2023

Degree/Department/Institution: PhD/Mathematics/OSU

Thesis: *Retractive operadic algebras in spectra and completions.*

### Duncan A. Clark

Mentoring Dates: 05/2017 – 05/2021

Degree/Department/Institution: PhD/Mathematics/OSU

Thesis: *An operad structure for the Goodwillie derivatives of the identity functor in structured ring spectra.*

## **Nikolas Schonsheck**

Mentoring Dates: 05/2017 – 05/2021

Degree/Department/Institution: PhD/Mathematics/OSU

Thesis: *Fibration theorems and the Taylor tower of the identity for spectral operadic algebras.*

## **Yu Zhang**

Mentoring Dates: 07/2016 – 05/2020

Degree/Department/Institution: PhD/Mathematics/OSU

Thesis: *Topological Quillen localization and homotopy pro-nilpotent structured ring spectra.*

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Note: No doctoral students above this line had graduated before my 2018 promotion-to-tenure case; i.e., my 6th-year-review dossier was finalized and submitted to the mathematics department on 09/16/2018.

## **Jacobson R. Blomquist**

Mentoring Dates: 08/2014 – 05/2018

Degree/Department/Institution: PhD/Mathematics/OSU

Thesis: *Iterated desuspension and delooping of structured ring spectra.*

## **Mentoring: Postdoctoral Fellows (OSU)**

**Ben Szczesny** (pronounced “shez-nee”) (co-mentor joint with Crichton Ogle)

Mentoring Dates: 09/2023 – 05/2026 (expected)

Department/Institution: Mathematics/OSU

**Zeshen Gu** (co-mentor joint with Crichton Ogle)

Mentoring Dates: 09/2022 – 05/2025 (expected)

Department/Institution: Mathematics/OSU

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Note: No postdoctoral mentoring above this line was available for my 2018 promotion-to-tenure case; i.e., my 6th-year-review dossier was finalized and submitted to the mathematics department on 09/16/2018.

## **Gabriel Valenzuela**

Mentoring Dates: 09/2015 – 05/2018

Department/Institution: Mathematics/OSU

## **Mentoring: Masters Students (EPFL)**

**Varvara Karpova**

Mentoring Dates: Spring 2009

Degree/Department/Institution: MS/Mathematics/École Polytechnique Fédérale de Lausanne (EPFL)

Thesis: *Why HZ-algebra spectra are differential graded algebras.*

## **Mentoring: Undergraduate Students (OSU)**

**Jacob Kirn**

Mentoring Dates: Summer 2018

Department/Institution: Mathematics/OSU

Summer Project: *Honors Mathematics Preparation: Topics in Analysis I.*

**Kevin Idleman**

Mentoring Dates: Summer 2018  
Department/Institution: Mathematics/OSU  
Summer Project: *Honors Mathematics Preparation: Topics in Linear Algebra.*

**Kevin Idleman**

Mentoring Dates: Summer 2017  
Department/Institution: Mathematics/OSU  
Summer Project: *Honors Mathematics Preparation: Topics in Analysis I.*

**Mentoring: Undergraduate Students (EPFL)**

**Cyril Becker and Rosalie Chevalley**

Mentoring Dates: Spring 2009  
Department/Institution: Mathematics/École Polytechnique Fédérale de Lausanne (EPFL)  
Mini Project: *Notion de propriété universelle dans le langage de la théorie des catégories.*

**Lev Kiwi**

Mentoring Dates: Fall 2008  
Department/Institution: Mathematics/École Polytechnique Fédérale de Lausanne (EPFL)  
Semester Project: *Algèbres de Hopf.*

**Florent Mayencourt**

Mentoring Dates: Fall 2008  
Department/Institution: Mathematics/École Polytechnique Fédérale de Lausanne (EPFL)  
Semester Project: *Noeuds et invariants de Vassiliev.*

**Jean-Paul Wenger**

Mentoring Dates: Fall 2008  
Department/Institution: Mathematics/École Polytechnique Fédérale de Lausanne (EPFL)  
Semester Project: *Braid theory.*

**Service: Administrative and Professional (OSU)**

Note: Service to the Newark campus is listed first, followed by service to the Columbus campus.

**Newark, 6th Year Review P&T Subcommittee for Jennifer Kowalsky, Member, 2024:** TBA.

**Newark, Professional Standards Committee, Barnes Teaching Award Subcommittee, Chair, Jan–Dec 2024:** My primary responsibilities were to oversee the entire Barnes Teaching Award competition, including construction and distribution of nomination forms, collection of nominated faculty materials, organizing and chairing the award meeting, and preparation of the award statements.

**Newark, Professional Standards Committee, Service Award Subcommittee, Member, Jan–Dec 2024:** My primary responsibilities were to study and rank the award nominees.

**Newark, 4th Year Review P&T Subcommittee for Elizabeth Dillenburg, Member, 2023:** My primary responsibilities were to study the candidate's dossier materials, meet with the candidate, and draft the teaching section of our 3-person subcommittee's letter that summarizes the candidate's credentials for their 4th year review.

**Newark, Professional Standards Committee, Barnes Teaching Award Subcommittee, Chair, Jan–Dec 2023:** My primary responsibilities were to oversee the entire Barnes Teaching Award competition, including construction and distribution of nomination forms, collection of nominated faculty materials, organizing and chairing the award meeting, preparation of the award statements, and reading of the award statements at the spring faculty dinner.

**Newark, Professional Standards Committee, Service Award Subcommittee, Chair, Jan–Dec 2023:** My primary responsibilities were to oversee the entire Service Award competition, including construction and distribution of nomination forms, collection of nominated faculty materials, organizing and chairing the award meeting, preparation of the award statements, and reading of the award statements at the spring faculty dinner.

**Newark, Professional Standards Committee, Barnes Teaching Award Subcommittee, Chair, Jan–Dec 2022:** My primary responsibilities were to oversee the entire Barnes Teaching Award competition, including construction and distribution of nomination forms, collection of nominated faculty materials, organizing and chairing the award meeting, preparation of the award statements, and reading of the award statements at the spring faculty dinner.

**Newark, Professional Standards Committee, Service Award Subcommittee, Member, Jan–Dec 2022:** My primary responsibilities were to study and rank the award nominees.

**Newark, On Sabbatical Leave and Special Assignment 2020–2021**

**Newark, Professional Standards Committee, Teaching Excellence Award Subcommittee, Chair, Jan–Dec 2020:** My primary responsibilities were to oversee the entire teaching excellence award (TEA) competition, including distribution of nomination forms in both electronic and paper formats, collection of nominated faculty materials, and organization of the final voting process: Due to the covid pandemic, we did not perform classroom visitations.

**Newark, Professional Standards Committee, Service Award Subcommittee, Member, Jan–Dec 2020:** My primary responsibilities were to study and rank the award nominees.

**Newark, Professional Standards Committee, Teaching Excellence Award Subcommittee, co-Chair, Jan–Dec 2019:** My primary responsibilities were to help distribute the nomination forms in paper format, and to organize all of the classroom visitations. I also performed several classroom visitations. My further responsibilities were to study and rank the award nominees.

**Newark, Professional Standards Committee, Barnes Teaching Award Subcommittee, Member, Jan–Dec 2019:** My primary responsibilities were to study and rank the award nominees.

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Note: No Newark campus service work above this line was available for my 2018 promotion-to-tenure case; i.e., my 6th-year-review dossier was finalized and submitted to the mathematics department on 09/16/2018.

**Newark, Professional Standards Committee, Scholarly Accomplishment Award Subcommittee, Member, Jan–Dec 2018:** My primary responsibilities were to review award nominations and to participate in the award meeting discussions and rankings.

**Newark, Professional Standards Committee, Faculty Service Award Subcommittee, Chair, Jan–Dec 2018:** My primary responsibilities were to oversee the entire faculty service award competition, including distribution of nomination forms in both electronic and paper formats, collection of nominated faculty materials, organizing and chairing the award meeting, and preparation of the award statements.

**Newark, Professional Standards Committee, Faculty Initiated Student Assistantship Grant (FISAG) Subcommittee, Member, Jan–Dec 2018:** My primary responsibilities were to review grant applications. This subcommittee has a budget and we funded several grants.

**Newark, Faculty Well-Being Committee, Member, Jan–Dec 2018:** I contributed to discussions and ideas on a mentoring program for faculty, originally introduced by Melissa Jungers.

**Newark, Faculty Assembly, Secretary, 2017–2018:** My primary responsibilities were to (i) provide suggestions and feedback on discussions during the monthly executive committee meetings, (ii) to write and distribute the faculty assembly agenda, and (iii) to write and distribute the faculty assembly minutes.

**Newark, Faculty Well-Being Committee, Member, Jan–Dec 2017:** I contributed to discussions on a mentoring program, originally introduced by Melissa Jungers, that Jack Richardson wanted to reinvigorate and potentially modify/improve. One idea was to allow mentees to choose their mentors, and another idea was to provide bonus money (for books, travel) to mentors who consistently meet with their mentees.

**Newark, Professional Standards Committee, Chair, Jan–Dec 2016:** My primary responsibilities were to oversee the functioning of the several award and grant subcommittees. This included organizing meetings, working with the chairs of the various subcommittees, and resolving any difficulties that arose. Each month I would prepare reports for the faculty assembly and update the assembly on our activities. The key is to ensure that all deadlines are met during the “award season”; e.g., time tables for classroom visits, handing out the nomination forms, etc..., in the form of oversight of the several other subcommittee chairs.

**Newark, Professional Standards Committee, Scholarly Activities Grant Subcommittee, Member, Jan–Dec 2016:** My primary responsibilities were to review grant applications. This subcommittee has a budget and we funded several grants.

**Newark, Professional Standards Committee, Teaching Excellence Award Subcommittee, Chair, Jan–Dec 2016:** My primary responsibilities were to oversee the entire teaching excellence award (TEA) competition, including distribution of nomination forms in both electronic and paper formats, collection of nominated faculty materials, organization of class room visitations, performing classroom visitations, organizing and chairing the award meeting, preparation of the award statements, and reading of the award statements at the spring faculty dinner.

**Newark, Faculty Well-Being Committee, Member, Jan–Dec 2016:** Usually our primary responsibility is to organize the campus orientation for new faculty. Since there were no new faculty hired at Newark in 2016 our main responsibility was the survey.

**Newark, Professional Standards Committee, Barnes Teaching Award Subcommittee, Member, Jan–Dec 2015:** My primary responsibilities were to study and rank the award nominees.

**Newark, Professional Standards Committee, Teaching Excellence Award Subcommittee, Member, Jan–Dec 2015:** My primary responsibilities were to perform classroom visitations, distribute nomination forms, and study and vote on the award nominees.

**Newark, Professional Standards Committee, Barnes Teaching Award Subcommittee, Member, Jan–Dec 2014:** My primary responsibilities were to study and rank the award nominees.

**Newark, Professional Standards Committee, Teaching Excellence Award Subcommittee, Member, Jan–Dec 2014:** My primary responsibilities were to perform classroom visitations, distribute nomination forms, and study and vote on the award nominees.

**Columbus, Zassenhaus Lecture Committee, Member, 2023–2024:** My primary responsibility was to participate in the meeting that puts together and discusses a very short list of potential speakers for the upcoming Zassenhaus Lecture.

**Columbus, Graduate Student Recruitment Office Hours, Faculty Participant, 2023:** I was involved in the recruitment of one of the prospective graduate students.

**Columbus, Homotopy theory seminar, Co-organizer, 2023–2024:** This is being co-organized by the homotopy theory postdoctoral fellows Zeshen Gu and Ben Szczesny—my contributions were to explain how to run the seminar, explain how to set up accommodations for speakers, etc..., to attend the seminars, and to provide some extra funds from my Simons grant. We invited, set up accommodations for, and hosted the following speakers: (1) Lorenzo Riva (Notre Dame), (2) Ben Spitz (UCLA), (3) Connor Malin (Notre Dame), (4) Ishan Levy (MIT), (5) David White (Denison), (6) Candace Bethea (South Carolina), (7) Andrew Salch (Wayne State), (8) James Quigley (Virginia), (9) TBD: Alicia Lima (Chicago).

**Columbus, Invitation to Mathematics, Faculty Speaker, 2022:** The purpose of these lectures is to introduce 1st and 2nd year graduate students to active areas of research within the department. In Fall 2022 I delivered one long lecture (1.5+ hour) that introduced the basic ideas of homotopy theory, the notion of derived functors, and described recent results of my graduate student Blomquist and mine on Bousfield-Kan completions with respect to stabilization and Freudenthal suspension. The mathematics department regards this as equivalent to performing service on one departmental committee.

**Columbus, Graduate Student Recruitment Office Hours, Faculty Participant, 2022:** I was involved in the recruitment of one of the prospective graduate students.

**Columbus, On Sabbatical Leave and Special Assignment 2020–2021**

**Columbus, Homotopy theory seminar, Co-organizer, 2019–2020:** Invited, set up accommodations for, and hosted the following speakers: (1) Emily Rudman (Indiana), (2) Jun Hou Fung (Harvard), (3) Hood Chatham (MIT), (4) Jeremy Miller (Purdue), (5) David White (Denison), (6) Rick Jardine (Western Ontario), (7) Hieu Thai (Wayne State), (8) Shane Clark (Kentucky), (9) Foling Zou (Chicago), (10) Martin Frankland (Regina), (11) Maximilien Peroux (UIC).

**Columbus, Workshop on Functor Calculus, Co-organizer, 2019:** I was a co-organizer for this workshop on functor calculus at OSU in March 2019. This involved inviting speakers to give talks at the conference and offering travel support to 20+ graduate students and postdocs wanting to attend. We had 6 main speakers and 14



contributed speakers: (1) Michael Ching (Amherst), (2) Tom Goodwillie (Brown), (3) Brenda Johnson (Union), (4) John Klein (Wayne State), (5) Ayelet Lindenstrauss (Indiana), (6) Michael Weiss (Muenster), (7) Jake Blomquist (Binghamton), (8) Duncan Clark (OSU), (9) Kyle Ferendo (Brown), (10) Keely Grossnickle (Kansas State), (11) Philip Hackney (Louisiana), (12) Jens Kjaer (Notre Dame), (13) Robin Koytcheff (Louisiana), (14) Cynthia Lester (Oregon), (15) Apurva Nakade (Johns Hopkins), (16) Peter Patzt (Purdue), (17) Yuri Sulyma (UT Austin), (18) Paul Tsopmene (Regina), (19) David White (Dennison), (20) Sarah Yeakel (Maryland). The total attendance was around 50+ participants.

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Note: No Columbus campus service work above this line was available for my 2018 promotion-to-tenure case; i.e., my 6th-year-review dossier was finalized and submitted to the mathematics department on 09/16/2018.

**Columbus, Homotopy theory seminar, Co-organizer, 2018–2019:** Invited, set up accommodations for, and hosted the following speakers: (1) Manuel Rivera (Miami, Florida), (2) Mark Johnson (Altoona), (3) Daniel Davis (Louisiana), (4) David White (Denison), (5) Alex Rolle (Western Ontario).

**Columbus, Graduate Studies Committee, Member, 2018–2019:** My primary responsibilities were (i) to study and vote on proposals and petitions involving graduate students in all aspects of their graduate school careers, (ii) to perform classroom visitations for graduate student teaching awards, (iii) to contribute to the discussions on the various graduate student petitions, and (iv) to study and rank graduate research fellowship applications.

**Columbus, Mathematics Chair Search Committee, Member, 2017–2018:** My primary responsibilities were to contribute to the discussions on creating and implementing the process for gathering information for the deans as part of the chair selection process in the department of mathematics. This included the format of “town hall” style meetings, and comments and revisions on the document prepared for the deans.

**Columbus, Regional AMS Conference Organizing Committee, Member, 2017–2018:** I helped reserve the Ballroom in the Student Union for the large 700+ person banquet for the upcoming Spring 2018 regional AMS conference at OSU.

**Columbus, Special Session on Homotopy Theory Conference, Co-organizer, 2017–2018:** I was a co-organizer for the special session on Homotopy Theory conference. This involved inviting speakers to give talks at the conference. We now have 20 confirmed speakers who have accepted our invitations: (1) Gabe Angelini-Knoll (Michigan State), (2) Ozgur Bayindir (UIC), (3) Eva Belmont (MIT), (4) Jake Blomquist (OSU), (5) Anna Marie Bohmann (Vanderbilt), (6) Jonathan Campbell (Vanderbilt), (7) Michael Ching (Amherst), (8) Phillip Jedlovac (Notre Dame), (9) Brenda Johnson (Union), (10) Mark Johnson (Penn State Altoona), (11) Nicholas Meadows (Western Ontario), (12) Mona Merling (Johns Hopkins), (13) Tasos Moulinos (UIC), (14) Luis Pereira (Notre Dame), (15) James D. Quigley (Notre Dame), (16) Dan Ramras (IUPUI), (17) Nima Rasekh (UIUC), (18) Nat Stapleton (Regensburg/Kentucky), (19) Paul van Koughnett (Northwestern), (20) Calvin Woo (Indiana).

**Columbus, Homotopy theory seminar, Co-organizer, 2017–2018:** Invited, set up accommodations for, and hosted the following speakers: (1) Eva Belmont (MIT), (2) Phillip Jedlovac (Notre Dame), (3) Bob Bruner (Wayne State), (4) Jens Kjaer (Notre Dame), (5) Guchuan Li (Northwestern), (6) Peter Haine (MIT), (7) Ozgur Bayindir (UIC), (8) Nima Rasekh (UIUC), (9) Clover May (Oregon), (10) Bernardo Villarreal (IUPUI), (11) Nicholas Meadows (Western Ontario).

**Columbus, K-theory/motivic homotopy theory seminar, Co-organizer, 2017–2018:** Invited, set up accommodations for, and hosted the following speakers: (1) Elden Elmanto (Northwestern), (2) James Quigley (Notre Dame).

**Columbus, K-theory/motivic homotopy theory seminar, Co-organizer, 2016–2017:** Invited, setup accommodations for, and personally hosted the following speakers: (1) Teena Gerhardt (Michigan State), (2) Anna Marie Bohmann (Vanderbilt).

**Columbus, Graduate Studies Committee, Member, 2016–2017:** My primary responsibilities were (i) to study and vote on proposals and petitions involving graduate students in all aspects of their graduate school careers, (ii) to perform classroom visitations for graduate student teaching awards, (iii) to contribute to the discussions on the various graduate student petitions, and (iv) to study and rank graduate research fellowship applications.

**Columbus, Invitation to Mathematics, Faculty Speaker, 2016:** The purpose of these lectures is to introduce 1st and 2nd year graduate students to active areas of research within the department. In Fall 2016 I delivered one long lecture (1.5+ hour) that introduced the basic ideas of homotopy theory, the notion of stabilization phenomena,

and described recent results of my graduate student Blomquist and mine on resolving the integral chains problem. The mathematics department regards this as equivalent to performing service on one departmental committee.

**Columbus, Graduate Studies Committee, Member, 2015–2016:** My primary responsibilities were (i) to study and vote on proposals and petitions involving graduate students in all aspects of their graduate school careers, (ii) to perform classroom visitations for graduate student teaching awards, (iii) to contribute to the discussions on the various graduate student petitions, and (iv) to study and rank graduate research fellowship applications.

**Columbus, K-theory/motivic homotopy theory seminar, Co-organizer, 2015–2016:** Invited, set up accommodations for, and hosted the following speakers: (1) Ben Knudsen (Northwestern) (2) Philip Egger (Northwestern) (3) Prasit Bhattacharya (Notre Dame).

**Columbus, Topology seminar, Co-organizer, 2015–2016:** Invited, set up accommodations for, and hosted the following speakers: (1) Sarah Yeakel (UIUC) (2) Jon Beardsley (Johns Hopkins).

**Columbus, MTS Mathematics Conference, Co-organizer, 2015–2016:** I was a co-organizer for the Midwest Topology Seminar (MTS) conference (we had about 45+ participants) that was held at OSU in May 2016. This was a 1-day conference at OSU with 4 main speakers: (1) Wouter van Limbeek (Michigan), (2) Emily Riehl (Johns Hopkins), (3) Ayelet Lindenstrauss (Indiana), (4) Michael Ching (Amherst). The preparations for this began in 2015 and involved requesting funds from our MRI (Mathematics Research Institute) to match the funds from MTS. My participation included inviting one of the speakers, arranging accommodations at The Blackwell for each of the 4 speakers, and reserving a large conference room (one of the big physics lecture halls next to the math tower). I also helped initially contact some of the hotels for blocking off a bunch of rooms—this involved us changing the date of the conference away from graduation weekend when we realized the extreme cost of graduation weekend hotel rates. The final arrangement for the rooms was worked out by Crichton Ogle’s efforts. The bulk of my work was done in 2016 when the conference actually happened and reimbursement forms needed to be processed. My responsibilities included arranged the catering (coffee, fruit bowls, coffee) from Panera, setting up the tables for the catering, and collecting reimbursement forms.

**Columbus, Graduate Student Recruitment Dinner, Faculty Participant, 2016:** I was involved in the recruitment of one of the prospective graduate students.

**Columbus, Invitation to Mathematics, Faculty Speaker, 2015–2016:** The purpose of these lectures is to introduce 1st and 2nd year graduate students to active areas of research within the department. In the 2015–2016 academic year I delivered two lectures (55 minutes each) that introduced the role of homotopy theory in solving mathematical problems, along with the notion of abelianizing a space. The mathematics department regards this participation as equivalent to performing service on one departmental committee.

**Columbus, Topology seminar, Co-organizer, 2014–2015:** Invited, set up accommodations for, and hosted the following speakers: (1) Michael Donovan (MIT) (2) Michael Ching (Amherst) (3) Michael Andrews (MIT) (4) Luis Pereira (Virginia) (5) Jon Beardsley (Johns Hopkins) (6) Aaron Mazel-Gee (Berkeley) (7) Gabriel Valenzuela (Wesleyan) (8) Emmanuele Dotto (MIT).

**Columbus, Graduate Student Recruitment Dinner, Faculty Participant, 2015:** I was involved in the recruitment of one of the prospective graduate students.

**Columbus, Invitation to Mathematics, Faculty Speaker, 2014–2015:** The purpose of these lectures is to introduce 1st and 2nd year graduate students to active areas of research within the department. In the 2014–2015 academic year, I delivered two lectures (55 minutes each) that introduced the basic ideas Quillen homology with examples including (i) homology of groups, (ii) homology of spaces, and (iii) Andre-Quillen homology of commutative rings. The mathematics department regards these as equivalent to performing service on one departmental committee.

**Columbus, Postdoc Hiring Committee, Member, 2014–2015:** My primary responsibilities were to study and rank all of the nominated postdoc applications. The resulting short list was highly competitive, and generated acceptances for all of the positions.

## Refereeing Work: Service to the Profession

2023 Journal of the London Mathematical Society (1 Article). Referee.

2023 Advances in Mathematics (1 Article). Referee.

2023 Expositiones Mathematicae (1 Article). Referee.

2023 University of Melbourne, Department of Mathematics (1 PhD Thesis). Outside Thesis Referee.

2022 Journal of Pure and Applied Algebra (1 Article). Referee.

2020 Proceedings of the London Mathematical Society. Referee.

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Note: No refereeing work above this line was available for my 2018 promotion-to-tenure case; i.e., my 6th-year-review dossier was finalized and submitted to the mathematics department on 09/16/2018.

2017 Homology, Homotopy and Applications (1 Article). Referee.

2016 Algebraic & Geometric Topology (1 Article). Referee.

2015 Algebraic & Geometric Topology (1 Article). Referee.

2015 Homology, Homotopy and Applications (1 Article). Referee.

2015 Israel Journal of Mathematics (1 Article). Referee.

2015 Proceedings of the American Mathematical Society (1 Article). Referee.

2015 Proceedings of the London Mathematical Society (1 Article). Referee.

2013 Algebraic & Geometric Topology (1 Article). Referee.

2012 Journal of Pure and Applied Algebra (1 Article). Referee.

2011 Algebraic & Geometric Topology (1 Article). Referee.

### **Grant Reviewing Work: Service to the Profession**

2021 Simons Foundation: Collaboration Grants for Mathematicians (Many Grants). Peer Reviewer.

2020 Simons Foundation: Collaboration Grants for Mathematicians (Many Grants). Peer Reviewer.

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Note: No grant reviewing work above this line was available for my 2018 promotion-to-tenure case; i.e., my 6th-year-review dossier was finalized and submitted to the mathematics department on 09/16/2018.

2015 *Israel Science Foundation*, Jerusalem, Israel (1 Grant). Peer Reviewer.

2012 *Shota Rustaveli National Science Foundation*, Tbilisi, Georgia (1 Grant). Peer Reviewer.

2011 *Shota Rustaveli National Science Foundation*, Tbilisi, Georgia (1 Grant). Peer Reviewer.

### **AMS MathSciNet: Service to the Profession**

2016 New York Journal of Mathematics (Summary of 1 Article)

2015 Advances in Mathematics (Summary of 1 Article)

2015 Ricerche di Matematica (Summary of 1 Article)

2014 Algebraic & Geometric Topology (Summary of 1 Article)

### **Service as an (External) Graduate Faculty Representative**

2023 Xiaoyu Liu, The Ohio State University. Graduate Faculty Representative: Dissertation Committee.

2022 Rana Tarabay, The Ohio State University. Graduate Faculty Representative: 2nd Candidacy Examination Committee.

2021 Anup Panindre, The Ohio State University. Graduate Faculty Representative: Dissertation Committee.

2020 Cory Myers, The Ohio State University. Graduate Faculty Representative: Dissertation Committee.

2019 David Glasbrenner, The Ohio State University. Graduate Faculty Representative: Dissertation Committee.

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Note: No graduate faculty representative service above this line was available for my 2018 promotion-to-tenure case; i.e., my 6th-year-review dossier was finalized and submitted to the mathematics department on 09/16/2018.

2018 Katherine McKenney, The Ohio State University. Graduate Faculty Representative: Dissertation Committee.  
2016 Qinggeng Zhuang, The Ohio State University. Graduate Faculty Representative: Dissertation Committee.  
2015 Dan Campbell, The Ohio State University. Graduate Faculty Representative: 2nd Candidacy Examination Committee.

## Conferences Organized

Note: Details for these are elaborated above in Service.

**Workshop on Functor Calculus.** The Ohio State University, Spring 2019, co-organizer.  
**AMS Special Session on Homotopy Theory.** The Ohio State University, Spring 2018, co-organizer.  
**AMS Sectional Meeting.** The Ohio State University, Spring 2018, local co-organizer.  
**MTS Conference (Midwest Topology Seminar).** The Ohio State University, Spring 2016, co-organizer.

## Seminars Organized

Note: Details for these are elaborated above in Service.

**OSU Homotopy Theory Seminar.** The Ohio State University, 2023–2024 co-organizer.  
**OSU Homotopy Theory Seminar.** The Ohio State University, 2019–2020 co-organizer.  
**OSU K-theory and Motivic Homotopy Theory Seminar.** The Ohio State University, 2019–2020, co-organizer.  
**OSU Homotopy Theory Seminar.** The Ohio State University, 2018–2019 co-organizer.  
**OSU K-theory and Motivic Homotopy Theory Seminar.** The Ohio State University, 2018–2019, co-organizer.  
**OSU Homotopy Theory Seminar.** The Ohio State University, 2017–2018 co-organizer.  
**OSU K-theory and Motivic Homotopy Theory Seminar.** The Ohio State University, 2017–2018, co-organizer.  
**OSU K-theory and Motivic Homotopy Theory Seminar.** The Ohio State University, 2016–2017, co-organizer.  
**OSU K-theory and Motivic Homotopy Theory Seminar.** The Ohio State University, 2015–2016, co-organizer.  
**OSU Topology Seminar.** The Ohio State University, 2014–2015 co-organizer.  
**OSU K-theory and Motivic Homotopy Theory Seminar.** The Ohio State University, 2014–2015, co-organizer.  
**UWO Geometry and Topology Seminar.** University of Western Ontario, 2011–2012, co-organizer.  
**EPFL Séminaire de Topologie.** École Polytechnique Fédérale de Lausanne, Spring 2009, co-organizer.  
**ND Graduate Topology Seminar,** University of Notre Dame, 2007–2008, organizer.

## Awards: Teaching and Service (OSU)

**Newark, Teaching Excellence Award, 2024:** “To recognize individuals doing excellent teaching and to stimulate excellence in teaching.”

**Newark, Service Award, 2019:** “To recognize outstanding contributions in the area of service.”

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Note: No awards above this line were available for my 2018 promotion-to-tenure case; i.e., my 6th-year-review dossier was finalized and submitted to the mathematics department on 09/16/2018.

**Newark, Teaching Excellence Award, 2018:** “To recognize individuals doing excellent teaching and to stimulate excellence in teaching.”

## Teaching: Undergraduate and Graduate (OSU)

**Math 1172:** Section 002. Engineering Mathematics A, Spring 2024, The Ohio State University, Newark. Instructor.  
**Math 1172:** Section 001. Engineering Mathematics A, Spring 2024, The Ohio State University, Newark. Instructor.  
**Math 6193:** Individual Studies in Mathematics, Fall 2023, The Ohio State University, Columbus. Instructor.



**Math 7193:** Individual Studies in Mathematics, Fall 2018, The Ohio State University, Columbus. Instructor.

**Math 6193:** Individual Studies in Mathematics, Fall 2018, The Ohio State University, Columbus. Instructor.

**Math 1151:** Section 001. Calculus I, Fall 2018, The Ohio State University, Newark. Instructor.

**Math 1151:** Section 004. Calculus I, Fall 2018, The Ohio State University, Newark. Instructor.

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Note: No classes taught above this line were completed for my 2018 promotion-to-tenure case; i.e., my 6th-year-review dossier was finalized and submitted to the mathematics department on 09/16/2018.

**Math 7193:** Individual Studies in Mathematics, Summer 2018, The Ohio State University, Columbus. Instructor.

**Math 7193:** Individual Studies in Mathematics, Summer 2018, The Ohio State University, Columbus. Instructor.

**Math 7193:** Individual Studies in Mathematics, Spring 2018, The Ohio State University, Columbus. Instructor.

**Math 7193:** Individual Studies in Mathematics, Spring 2018, The Ohio State University, Columbus. Instructor.

**Math 7193:** Individual Studies in Mathematics, Spring 2018, The Ohio State University, Columbus. Instructor.

**Math 7193:** Individual Studies in Mathematics, Spring 2018, The Ohio State University, Columbus. Instructor.

**Math 1151:** Section 002. Calculus I, Spring 2018, The Ohio State University, Newark. Instructor.

**Math 8999:** Individual Studies in Mathematics, Fall 2017, The Ohio State University, Columbus. Instructor.

**Math 8999:** Individual Studies in Mathematics, Fall 2017, The Ohio State University, Columbus. Instructor.

**Math 7193:** Individual Studies in Mathematics, Fall 2017, The Ohio State University, Columbus. Instructor.

**Math 6193:** Individual Studies in Mathematics, Fall 2017, The Ohio State University, Columbus. Instructor.

**Math 1151:** Section 001. Calculus I, Fall 2017, The Ohio State University, Newark. Instructor.

**Math 1151:** Section 002. Calculus I, Fall 2017, The Ohio State University, Newark. Instructor.

**Math 7193:** Individual Studies in Mathematics, Summer 2017, The Ohio State University, Columbus. Instructor.

**Math 7193:** Individual Studies in Mathematics, Summer 2017, The Ohio State University, Columbus. Instructor.

**Math 8999:** Individual Studies in Mathematics, Spring 2017, The Ohio State University, Columbus. Instructor.

**Math 7193:** Individual Studies in Mathematics, Spring 2017, The Ohio State University, Columbus. Instructor.

**Math 7193:** Individual Studies in Mathematics, Spring 2017, The Ohio State University, Columbus. Instructor.

**Math 7193:** Individual Studies in Mathematics, Spring 2017, The Ohio State University, Columbus. Instructor.

**Math 6193:** Individual Studies in Mathematics, Spring 2017, The Ohio State University, Columbus. Instructor.

**Math 1152:** Section 001. Calculus II, Spring 2017, The Ohio State University, Newark. Instructor.

**Math 8999:** Individual Studies in Mathematics, Fall 2016, The Ohio State University, Columbus. Instructor.

**Math 6193:** Individual Studies in Mathematics, Fall 2016, The Ohio State University, Columbus. Instructor.

**Math 1151:** Section 001. Calculus I, Fall 2016, The Ohio State University, Newark. Instructor.

**Math 1151:** Section 002. Calculus I, Fall 2016, The Ohio State University, Newark. Instructor.

**Math 8999:** Individual Studies in Mathematics, Summer 2016, The Ohio State University, Columbus. Instructor.

**Math 6193:** Individual Studies in Mathematics, Summer 2016, The Ohio State University, Columbus. Instructor.

**Math 6193:** Individual Studies in Mathematics, Summer 2016, The Ohio State University, Columbus. Instructor.

**Math 8999:** Individual Studies in Mathematics, Spring 2016, The Ohio State University, Columbus. Instructor.

**Math 6193:** Individual Studies in Mathematics, Spring 2016, The Ohio State University, Columbus. Instructor.

**Math 1151:** Section 001. Calculus I, Spring 2016, The Ohio State University, Newark. Instructor.

**Math 8999:** Individual Studies in Mathematics, Fall 2015, The Ohio State University, Columbus. Instructor.

**Math 1151:** Section 001. Calculus I, Fall 2015, The Ohio State University, Newark. Instructor.

**Math 1151:** Section 002. Calculus I, Fall 2015, The Ohio State University, Newark. Instructor.

**Math 7193:** Individual Studies in Mathematics, Summer 2015, The Ohio State University, Columbus. Instructor.

**Math 6193:** Individual Studies in Mathematics, Spring 2015, The Ohio State University, Columbus. Instructor.

**Math 7193:** Individual Studies in Mathematics, Fall 2014, The Ohio State University, Columbus. Instructor.

**Math 1151:** Section 001. Calculus I, Fall 2014, The Ohio State University, Newark. Instructor.

**Math 1151:** Section 002. Calculus I, Fall 2014, The Ohio State University, Newark. Instructor.

**Math 6193:** Individual Studies in Mathematics, Spring 2014, The Ohio State University, Columbus. Instructor.

**Math 1151:** Section 001. Calculus I, Spring 2014, The Ohio State University, Newark. Instructor.

**Math 1151:** Section 001. Calculus I, Fall 2013, The Ohio State University, Newark. Instructor.

**Math 1151:** Section 002. Calculus I, Fall 2013, The Ohio State University, Newark. Instructor.

### Teaching: Undergraduate (Purdue)

**Math 35300:** Section 161. Linear algebra II, Spring 2013, Purdue University. Instructor.

**Math 35300:** Section 162. Linear algebra II, Spring 2013, Purdue University. Instructor.

**Math 35300:** Section 001. Linear algebra II, Fall 2012, Purdue University. Instructor.

**Math 35300:** Section 002. Linear algebra II, Fall 2012, Purdue University. Instructor.

### Teaching: Undergraduate (Western Ontario)

**Calc 1000A:** Section 007. Calculus I, Fall 2011, University of Western Ontario. Instructor.

**Calc 1000A:** Section 011. Calculus I, Fall 2011, University of Western Ontario. Instructor.

**Calc 1000A:** Section 008. Calculus I, Fall 2010, University of Western Ontario. Instructor.

### Teaching: Undergraduate and Graduate (EPFL)

**Algebraic topology (topics course)**, Spring 2010, École Polytechnique Fédérale de Lausanne. Instructor.

**Theory of knots**, Fall 2009, École Polytechnique Fédérale de Lausanne. Assistant.

**Homology and cohomology**, Spring 2009, École Polytechnique Fédérale de Lausanne. Assistant.

**Elements of homotopy**, Fall 2008, École Polytechnique Fédérale de Lausanne. Assistant.

### Teaching: Undergraduate (Notre Dame)

**Math 10560.** Calculus II, Fall 2007, University of Notre Dame. Instructor.

**Math 10560.** Calculus II, Fall 2006, University of Notre Dame. Instructor.

**Math 20550.** Calculus III, Fall 2005, University of Notre Dame. Instructor.

**Math 10560.** Calculus II, Spring 2005, University of Notre Dame. Teaching assistant.

**Math 20550.** Calculus III, Fall 2004, University of Notre Dame. Teaching assistant.

### Selected Invited Talks

**Purdue University**, Topology Seminar, September 25, 2019: “Completion towers and localizations in spaces and structured ring spectra”.

**University of Western Ontario**, Geometry and Topology Seminar, November 12, 2018: “Completion towers and localizations in spaces and structured ring spectra”.

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Note: No invited talks above this line were available for my 2018 promotion-to-tenure case; i.e., my 6th-year-review dossier was finalized and submitted to the mathematics department on 09/16/2018.

**Indiana University**, AMS Special Session on Homotopy Theory, April 2, 2017: “Iterated suspension spaces and an integral analog of Quillen’s rational homotopy theorem.”.

**Union College**, Union College Mathematics Conference, Session on Algebraic Topology, December 3, 2016: “Iterated suspension spaces and an integral analog of Quillen’s rational homotopy theorem”.

**Purdue University**, Topology Seminar, December 2, 2015: “Derived Koszul duality of spaces and structured ring spectra”.

**University of Notre Dame**, Topology Seminar, October 7, 2015: “Derived Koszul duality of spaces and structured ring spectra”.

**University of Bergen**, Topology Seminar, April 16, 2015: “Homotopical essential surjectivity: comparing O-algebra spectra and K-coalgebra spectra”.

**University of Bergen**, Topology Seminar, April 9, 2015: “Derived Koszul duality and TQ-homology completion”.

**The Ohio State University**, Topology Seminar, March 24, 2015: “Derived Koszul duality and TQ-homology completion”.

**Massachusetts Institute of Technology**, Topology Seminar, February 17, 2015: “Derived Koszul duality and TQ-homology completion”.

**The University of Manchester**, Conference on Stable Homotopy Theory: Structured Ring Spectra and their Invariants, September 3, 2014: “On a structured ring spectra analog of Quillen–Sullivan theory”.

**Mathematical Sciences Research Institute**, MSRI Workshop on Connections for Women: Algebraic Topology, January 24, 2014: “On a structured ring spectra analog of Quillen–Sullivan theory”.

**Union College**, Union College Mathematics Conference, Session on Algebraic Topology, October 19, 2013: “K-coalgebras, TQ-completion, and a structured ring spectra analog of Quillen–Sullivan theory”.

**The Ohio State University**, K-Theory and Motivic Homotopy Theory Seminar, October 8, 2013: “On a homotopic descent result for topological Quillen homology of structured ring spectra”.

**The Ohio State University**, K-Theory and Motivic Homotopy Theory Seminar, October 1, 2013: “K-coalgebras, TQ-completion, and a structured ring spectra analog of Quillen–Sullivan theory”.

**The Ohio State University**, Topology Seminar, February 12, 2013: “Completions in topology and homotopy theory”.

**Purdue University**, Topology Seminar, January 24, 2013: “Coalgebras and TQ-complete structured ring spectra”.

**University of Illinois at Urbana-Champaign**, Topology Seminar, December 11, 2012: “TQ-homology completion of nilpotent structured ring spectra”.

**University of Massachusetts Amherst**, Valley Geometry Seminar, December 7, 2012: “Completions in topology and homotopy theory”.

**Indiana University**, Topology Seminar, November 28, 2012: “TQ-homology completion of nilpotent structured ring spectra”.

**Purdue University**, Topology Seminar, September 6, 2012: “Localization and completion of nilpotent structured ring spectra”.

**Purdue University**, Topology Seminar, August 30, 2012: “Structured ring spectra and TQ-homology”.

**University of Virginia**, Virginia Conference on Algebraic Topology, June 14, 2012: “TQ-completion, homotopy functor calculus, and nilpotent operadic algebras in modules over a ring spectrum”.

**Hunter College of the City University of New York**, Colloquium, May 22, 2012: “Homology, completions, and localizations of structured ring spectra”.

**University of Western Ontario**, Algebra Seminar, January 20, 2012: “Localization and completion of nilpotent structured ring spectra”.

**Boston, Massachusetts**, AMS Special Session on Homotopy Theory, January 7, 2012: “Localization and completion with respect to topological Quillen homology”.



**University of Western Ontario**, Geometry and Topology Seminar, September 19, 2011: “Completion with respect to topological André-Quillen homology”.

**Wesleyan University**, Topology Seminar, August 17, 2011: “Completion with respect to topological André-Quillen homology”.

**Universität Hamburg**, Conference on Structured Ring Spectra, August 2, 2011: “On a finiteness theorem and Quillen homology completion for algebras over operads in symmetric spectra”.

**Massachusetts Institute of Technology**, Topology Seminar, July 19, 2011: “Quillen homology completion and strong convergence of the associated homotopy spectral sequence”.

**University of Georgia**, Topology Seminar, April 11, 2011: “Homology completion, homotopy completion, and a finiteness theorem for operadic algebras in symmetric spectra”.

**University of Calgary**, PIMS Voyageur Colloquium, March 22, 2011: “Homotopy completion, homology completion, and a finiteness theorem for operadic algebras”.

**Massachusetts Institute of Technology**, Topology Seminar, February 7, 2011: “On a finiteness theorem and Quillen homology completion for algebras over operads in symmetric spectra”.

**University of Minnesota**, Topology Seminar, November 8, 2010: “On a homotopy completion tower for algebras over operads in symmetric spectra”.

**University of Virginia**, Topology Seminar, October 28, 2010: “On a homotopy completion tower for algebras over operads in symmetric spectra”.

**University of Western Ontario**, Algebra Seminar, October 15, 2010: “On a homotopy completion tower for algebras over operads”.

**Wayne State University**, Topology Seminar, October 12, 2010: “On a Whitehead theorem for topological Quillen homology of algebras over operads”.

**University of California Los Angeles**, AMS Special Session on Homotopy Theory and K-theory, October 9, 2010: “On a Whitehead theorem for topological Quillen homology of algebras and modules over operads”.

**University of Western Ontario**, Geometry and Topology Seminar, October 4, 2010: “On a Whitehead theorem for topological Quillen homology of algebras over operads”.

**Université Lille 1**, Workshop on Operads and Homotopy Theory, August 26, 2010: “On a Whitehead theorem for topological Quillen homology of algebras over operads”.

**Universität Bonn**, Topology Seminar, July 13, 2010: “On a Whitehead theorem for topological Quillen homology of algebras and modules over operads”.

**University of Copenhagen**, Algebra and Topology Seminar, June 7, 2010: “On a Whitehead theorem for topological Quillen homology of algebras and modules over operads”.

**Université Lille 1**, Séminaire de Topologie, March 26, 2010: “On a Whitehead theorem for topological Quillen homology of algebras and modules over operads”.

**Université Paris 13**, Séminaire de Topologie Algébrique, January 28, 2010: “On a Whitehead theorem for topological Quillen homology of modules and algebras over operads”.

**Isle of Skye, Scotland**, Conference on Algebraic Topology, Group Theory and Representation Theory, June 11, 2009: “Bar constructions and Quillen homology of modules over operads”.

**Le Châtelard, Switzerland**, Topology in the Swiss Alps, Young Topologists’ Meeting, April 26, 2009: “Bar constructions and Quillen homology of modules over operads”.

**North Carolina State University**, AMS Special Session on Homotopical Algebra with Applications to Mathematical Physics, April 4, 2009: “Bar constructions and Quillen homology of modules over operads”.

**Massachusetts Institute of Technology**, Topology Seminar, March 2, 2009: “Bar constructions and Quillen homology of modules over operads”.

**Université Lille 1**, Séminaire de Topologie, December 12, 2008: “Bar constructions and Quillen homology of modules over operads”.

**École Polytechnique Fédérale de Lausanne**, Séminaire de Topologie, November 27, 2008: “ $E_\infty$  algebras and  $p$ -adic homotopy theory”.

**University of Copenhagen**, Workshop on  $E_n$  Operads in Differential Graded Algebra, November 18, 2008: “ $E_\infty$  algebras and  $p$ -adic homotopy theory”.

**Universität Bonn**, Topology Seminar, October 21, 2008: “Bar constructions and Quillen homology of modules over operads”.

**École Polytechnique Fédérale de Lausanne**, Séminaire de Topologie, July 1, 2008: “Bar constructions and Quillen homology of modules over operads”.

**Wayne State University**, Topology Seminar, April 15, 2008: “Quillen homology of modules over operads”.

**University of Chicago**, Algebraic Topology Seminar, January 22, 2008: “Quillen homology of modules over operads”.

**University of Notre Dame**, Topology Seminar, October 11, 2007: “Co-operations on Quillen homology”.

**University of Chicago**, Graduate Student Topology Conference, April 21, 2007: “Quillen homology, homotopy algebras, and Koszul duality for operads”.

**Hebrew University of Jerusalem**, Graduate Homotopy Seminar, April 2006: “Delooping iterated loop spaces, quasifibrations, and bar constructions”.

**Hebrew University of Jerusalem**, Graduate Homotopy Seminar, March 2006: “Detecting loop spaces, monads from adjunctions, and a bar construction”.

**Hebrew University of Jerusalem**, Graduate Homotopy Seminar, March 2006: “Algebras over topological  $A_\infty$  operads,  $E_\infty$  operads, and the little  $n$ -cubes operad”.

**Hebrew University of Jerusalem**, Graduate Homotopy Seminar, March 2006: “Symmetric sequences, circle products, and modules over operads”.

## Selected Informal Talks

**The Ohio State University**, Invitations to Mathematics, Fall 2022: “Homotopy theory, derived functors, and Bousfield-Kan completion”.

**The Ohio State University**, Invitations to Mathematics, Fall 2016: “Homotopy theory, stabilization of spaces, and homotopical descent”.

**The Ohio State University**, Invitations to Mathematics, Fall 2015: “Homotopy theory and algebras over the sphere spectrum”.

**The Ohio State University**, Invitations to Mathematics, Fall 2015: “Homotopy theory, simplicial objects, and homological algebra”.

**The Ohio State University**, Invitations to Mathematics, Fall 2014: “Homotopy theory and structured ring spectra”.

**The Ohio State University**, Invitations to Mathematics, Fall 2014: “Homotopy theory and Quillen homology”.

**Purdue University**, Topics in Homological Algebra, Spring 2013: “Worked example: The homotopy spectral sequence of a tower of fibrations”.

**Purdue University**, Topics in Homological Algebra, Spring 2013: “Introduction to spectral sequences, exact couples, and convergence proofs”.

**Purdue University**, Topics in Homological Algebra, Spring 2013: “Construction of abelian and non-abelian derived categories and derived functors”.

**Purdue University**, Topics in Homological Algebra, Spring 2013: “Homotopy theory in homological algebra: An introduction to abelian and non-abelian derived categories and derived functors”.

**University of Western Ontario**, Topics in Homotopy Theory, Fall 2011: “Connections between Topology and Algebra: Homotopy theory, André-Quillen Homology, and Iterated Suspensions of Commutative Rings”.

**École Polytechnique Fédérale de Lausanne**, Working Group on the Stable  $h$ -Cobordism Theorem, Spring 2009: “Spaces of thickenings”.

**École Polytechnique Fédérale de Lausanne**, Working Group on the Stable  $h$ -Cobordism Theorem, Spring 2009: “Algebraic  $K$ -theory of spaces II”.

**École Polytechnique Fédérale de Lausanne**, Working Group on the Stable  $h$ -Cobordism Theorem, Spring 2009: “Algebraic  $K$ -theory of spaces I”.

## Conference Participation

**Workshop on Functor Calculus**, March 2019, organized by E. Fontes, J.E. Harper, C. Osborne, and N. Rao, at The Ohio State University.

**AMS Special Session on Homotopy Theory**, March 2018, organized by E. Fontes, J.E. Harper, C. Ogle, and G. Valenzuela, at The Ohio State University.

**AMS Special Session on Homotopy Theory**, April 2017, organized by D. Gepner, A. Lindenstrauss, M. Mandell, and D. Ramras, at Indiana University.

**Midwest Topology Seminar**, February 2017, organized by M. Behrens, at the University of Notre Dame.

**Union College Mathematics Conference, Session on Algebraic Topology**, December 2016, organized by B. Johnson and K. Lesh, at Union College.

**Midwest Topology Seminar**, September 2016, organized by D. Gepner, R. Kaufmann, J. McClure, and J. Miller, at Purdue University.

**Alpine Algebraic and Applied Topology Conference**, August 2016, organized by C. Ausoni, K. Hess, B. Johnson, I. Moerdijk, and J. Scherer, in Saas-Almagell, Switzerland.

**Midwest Topology Seminar**, May 2016, organized by J. Fowler, J.E. Harper, N. Johnson, J.F. Lafont, C. Ogle, N. Rao, G. Valenzuela, and D. Yau, at The Ohio State University.

**Midwest Topology Seminar**, February 2016, organized by L. Bandklayder, B. Knudsen, P. van Koughnett, and D. Wilson, at Northwestern University.

**Midwest Topology Seminar**, October 2015, organized by M. Behrens, D. Isaksen, and S. Tilson, at Wayne State University.

**Conference on K-theory: Future Directions**, May 2015, organized by G. Carlsson and R. Joshua, at The Ohio State University.

**Midwest Topology Seminar**, October 2014, organized by J. Francis and P. Goerss, at Northwestern University.

**Conference on Stable Homotopy Theory: Structured Ring Spectra and their Invariants**, September 2014, organized by A. Baker, N. Ray, and B. Richter, at the University of Manchester, Manchester, United Kingdom.

**Midwest Topology Seminar**, April 2014, organized by D. Ramras and M. Mandell, at Indiana University-Purdue University Indianapolis.

**MSRI Workshop: Reimagining the Foundations of Algebraic Topology**, April 2014, organized by V. Aneltveit, M. Behrens, J. Bergner, and A. Blumberg, at the Mathematical Sciences Research Institute, Berkeley.

**MSRI Introductory Workshop: Algebraic Topology**, January 2014, organized by T. Gerhardt, J. Grodal, K. Hess, and M. Hill, at the Mathematical Sciences Research Institute, Berkeley.

**MSRI Workshop on Connections for Women: Algebraic Topology**, January 2014, organized by J. Bergner, T. Gerhardt, and B. Shipley, at the Mathematical Sciences Research Institute, Berkeley.

**Union College Mathematics Conference, Session on Algebraic Topology**, October 2013, organized by B. Johnson and K. Lesh, at Union College.

**Midwest Topology Seminar**, October 2013, organized by R. Bruner and D. Isaksen, at Wayne State University.

**Midwest Topology Seminar**, May 2013, organized by K. Ponto and B. Guillou, at the University of Kentucky.

**Conference on Equivariant, Chromatic, and Motivic Homotopy Theory**, March 2013, organized by A.M. Bohmann, J. Francis, and P. Goerss, at Northwestern University.

**Midwest Topology Seminar**, February 2013, organized by M. Ando, M. Frankland, R. McCarthy, and C. Rezk, at the University of Illinois at Urbana-Champaign.

**Midwest Topology Seminar**, October 2012, organized by T. Gerhardt and M. Hedden, at Michigan State University.

**The Legacy of Daniel Quillen:  $K$ -theory and Homotopical Algebra**, October 2012, organized by C. Barwick, M. Behrens, J. Cuntz, E. Friedlander, M.J. Hopkins, J.-L. Loday, H.R. Miller, A. Ranicki, G. Segal, and I. Singer, at the Massachusetts Institute of Technology.

**Stanford Symposium on Algebraic Topology: applications and new directions—a conference to celebrate the birthdays of Gunnar Carlsson, Ralph Cohen, and Ib Madsen**, July 2012, organized by S. Galatius, D. Sinha, and U. Tillmann, at Stanford University.

**West Coast Algebraic Topology Summer School: advances in  $K$ -theory**, July 2012, organized by A. Adem, R. Cohen, and D. Sinha, at Stanford University.

**Virginia Conference on Algebraic Topology**, June 2012, organized by G. Arone, W.G. Dwyer, M. Hill, N. Kuhn, K. Lesh, and V. Turchin, at the University of Virginia.

**Midwest Topology Seminar**, March 2012, organized by A.M. Bohmann, A. Elmendorf, and P. Goerss, at Northwestern University.

**AMS Special Session on Homotopy Theory**, January 2012, organized by M. Behrens, M.W. Johnson, H.R. Miller, J. Turner, and D. Yau, in Boston, Massachusetts.

**AMS Special Session on Calculus of Functors and Its Applications**, January 2012, organized by B. Munson and I. Volic, in Boston, Massachusetts.

**Midwest Topology Seminar**, October 2011, organized by S. Chebolu and G. Seelinger, at Illinois State University.

**Conference on Structured Ring Spectra**, August 2011, organized by A. Baker and B. Richter, at the Universität Hamburg.

**Geometric and Algebraic Structures in Mathematics: a conference to celebrate Dennis Sullivan's 70th birthday**, May–June 2011, organized by A. Bonifant, J. Bowman, M. Lyubich, and S. Sutherland, at Stony Brook University.

**Functor Calculus and Operads Workshop**, March 2011, organized by M. Ching, N. Kuhn, and V. Turchin, at the Banff International Research Station, Alberta.

**Midwest Topology Seminar**, October 2010, organized by R. Bruner, P. Hu, D. Isaksen, and J. Klein, at Wayne State University.

**AMS Special Session on Homotopy Theory and  $K$ -theory**, October 2010, organized by J. Bergner and C. Haesemeyer, at the University of California Los Angeles.

**Conference on Homotopy Theory and Derived Algebraic Geometry**, September 2010, organized by P. Goerss and J.F. Jardine, at the Fields Institute for Research in Mathematical Science, Toronto.

**Workshop on Operads and Homotopy Theory**, August 2010, organized by D. Chataur, B. Fresse, and B. Vallette, at the Université Lille 1.

**Georgia Topology Conference: Goodwillie-Weiss embedding calculus and its application to spaces of knots**, May 2010, organized by M. Ching and N. Johnson, at the University of Georgia.

**Mayday 2009—New Contexts in Homotopy Theory: a conference in honor of Peter May on the occasion of his 70th birthday**, October 2009, organized by M. Basterra, M. Behrens, A. Blumberg, J. McClure, and M. Mandell, at the University of Chicago.

**$p$ -Adic Geometry and Homotopy Theory Conference**, August 2009, organized by J. Rognes, in the Nordfjord region of Loen, Norway.

**Conference on Algebraic Topology, Group Theory and Representation Theory**, June 2009, organized by D. Benson, C. Broto, I. Capdeboscq, R. Kessar, K. Lesh, R. Levi, and A. Libman, in Isle of Skye, Scotland.

**Topology in the Swiss Alps, Young Topologists' Meeting**, April 2009, organized by P. Müller, in Le Châtelard, Switzerland.

**AMS Special Session on Homotopical Algebra with Applications to Mathematical Physics**, April 2009, organized by T. Lada and J. Stasheff, at North Carolina State University.

**Workshop on  $E_n$  Operads in Differential Graded Algebra**, November 2008, organized by A. Berglund, B. Vallette, and N. Wahl, at the University of Copenhagen.

**Workshop on Higher Structures in Mathematics and Physics**, November 2008, organized by A. Alekseev, A. Cattaneo, and P. Xu, at the École Polytechnique Fédérale de Lausanne.

**Arolla Conference on Algebraic Topology**, August 2008, organized by C. Ausoni, K. Hess, and J. Scherer, in Arolla, Switzerland.

**Homotopical Group Theory and Topological Algebraic Geometry: a conference in honor of Haynes R. Miller on the occasion of his 60th birthday**, June 2008, organized by M. Ando, C.F. Bodigheimer, J. Grodal, G. Laures, and B. Shipley, at the Max Planck Institute, Bonn.

**Homotopical Group Theory and Topological Algebraic Geometry Workshop**, June 2008, organized by J. Grodal, I. Madsen, J. Møller, E. Pedersen, and N. Wahl, at the University of Copenhagen.

**Midwest Topology Seminar**, May 2008, at Northwestern University.

**Graduate Student Topology Conference**, March 2008, organized by D. Zaharopol and C. Wendler, at the University of Illinois at Urbana-Champaign.

**Midwest Topology Seminar**, February 2008, at the University of Notre Dame.

**Midwest Topology Seminar**, October 2007, at the University of Illinois at Urbana-Champaign.

**Workshop on Stacks in Geometry and Topology**, May 2007, organized by K. Behrend, P. Goerss, and B. Toën, at the Fields Institute for Research in Mathematical Science, Toronto.

**Graduate Student Topology Conference**, April 2007, organized by M. Abouzaid, B. Guillou, and K. Ponto, at the University of Chicago.

**Midwest Topology Seminar**, February 2007, at the University of Illinois at Chicago.

**Topics in Homotopy Theory Graduate Summer School**, August 2005, organized by K. Bauer and L. Scull, at the University of Calgary.

**Summer School on the Interactions between Homotopy Theory and Algebra**, July–August 2004, organized by L. Avramov, D. Christensen, W.G. Dwyer, M. Mandell, and B. Shipley, at the University of Chicago.

## Prizes: (RPI)

**Ricketts Prize**, Rensselaer Polytechnic Institute: “In recognition of demonstrated outstanding ability in academic work and promise for outstanding professional success.”

## Memberships

**American Mathematical Society** (2003–present).

## Languages

French (reading).

German (reading).

Upper Arlington, Ohio  
April 17, 2024