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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 had entered MIT to study rocket science, and by the time I left I was working full-time on mathematics. I received my PhD in mathematics at the **University of Notre Dame** (2003–2008). My thesis was written under the direction of **Bill Dwyer**. 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**. In 2013 I began my current position as assistant professor. 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).

Editor for

Tbilisi Mathematical Journal (Nov. 2015–present)

This is a relatively new general mathematical journal, founded in 2008 by Tbilisi Centre for Mathematical Sciences (TCMS). It is electronically published online by De Gruyter Open and covers all important areas of mathematics. The journal is fully open-access and free of charge. TCMS also owns another mathematical journal “Journal of Homotopy and Related Structures” printed by Springer.

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

Current PhD Students

Yu Zhang, The Ohio State University—PhD in Mathematics: May 2020 (tentative)

Duncan Clark, The Ohio State University—PhD in Mathematics: May 2021 (tentative)

Niko Schonsheck, The Ohio State University—PhD in Mathematics: May 2021 (tentative)

Research Interests

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

Education and Employment

Assistant Professor (2013–present)

Department of Mathematics, The Ohio State University, Newark

Visiting Assistant Professor (2012–2013)

Department of Mathematics, Purdue University

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 going full-time into mathematics in 2003, I studied rocket science 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*

Preprints: In Progress

Ring spectra, abelianization, and the density argument.

(with J. Blomquist and C. Ogle). Work is partially complete—in progress.

Note: We identify bounded below ring spectra with coalgebras over the abelianization of spaces comod. This paper originated with informal tangential discussions with Ogle related to a problem in algebraic K-theory—it is essentially a spinoff of a technical idea exploited in the recent monograph of Dundas-Goodwillie-McCarthy. The mathematics is mostly complete for ring spectra; we are currently working through the technical details associated to the expected operadic spectral algebra generalizations.

Preprints: In Preparation

Localization of structured ring spectra with respect to TQ-homology.

(with Y. Zhang). Work is complete—draft in preparation (submission expected: Summer 2018).

Note: In this work we establish a functorial TQ-homology with coefficients localization construction together with an associated TQ-local homotopy theory—important: we require no connectivity assumptions on the structured ring spectra. The aim of this work is to pave the way to establish arithmetic fracture squares for TQ-homology with coefficients localizations, but for weaker assumptions than connectivity (where the TQ-completion construction may not always yield the “correct” object). The mathematics is complete; only typing to be finished.

Fracture squares and completion for TQ-homology with coefficients.

(with C. Ogle and Y. Zhang). Work is complete—draft in preparation (submission expected: Summer 2018).

Note: In this work we establish certain fracture squares for TQ-homology completion with coefficients of connected structured ring spectra. The key technical work is proving the commutation of various completions—due to our assumptions on the coefficient ring spectra, this is essentially a rational result: it produces the fracture squares built from TQ-completion with coefficients in subrings of the rationals by proving that the expected squares agree with the usual squares on the underlying category of spectra. The analog for p -completion (and hence the arithmetic fracture square for TQ-completion with coefficients) remains open. The mathematics is complete; only typing to be finished.

Preprints: Submitted for Publication

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

(with M. Ching). Submitted for publication (9 pages), 2018.

Iterated suspension and higher Freudenthal suspension.

(with J. Blomquist). This paper is being consolidated into an appendix of the higher stabilization paper below. (17 pages), 2016.

Suspension spectra and higher stabilization.

(with J. Blomquist). Submitted for publication (18 pages), 2016. (Revised version: May 2017)

Integral chains and Bousfield-Kan completion.

(with J. Blomquist). Submitted for publication (26 pages), 2016. (Revised version: Oct 2017)

Derived Koszul duality and TQ-homology completion of structured ring spectra.

(with M. Ching). Submitted for publication (57 pages), 2015. (Revised version: Feb 2018)

Publications

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. Corrigendum.

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- Σ 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.

Awards: Teaching (OSU)

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

Extended 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)

Duncan Clark

Dates: 05/2017 – 05/2021 (tentative)

Degree/Department/Institution: PhD/Mathematics/OSU

Dissertation Topic: TBA

Niko Schonsheck

Dates: 05/2017 – 05/2021 (tentative)

Degree/Department/Institution: PhD/Mathematics/OSU

Dissertation Topic: TBA

Yu Zhang

Dates: 07/2016 – 05/2020 (tentative)

Degree/Department/Institution: PhD/Mathematics/OSU

Dissertation Topic: TBA

Jacobson R. Blomquist

Dates: 08/2014 – 05/2018

Degree/Department/Institution: PhD/Mathematics/OSU

Dissertation Topic: Iterated desuspension and delooping of structured ring spectra.

Current Position: Postdoctoral Fellow (2018–2021), Binghamton University (SUNY), Department of Mathematical Sciences.

Mentoring: Postdoctoral Fellows (OSU)

Gabriel Valenzuela

Dates: 09/2015 – 05/2018

Department/Institution: Mathematics/OSU

Current Position: Postdoctoral Fellow (2018–2020), Max Planck Institute for Mathematics, Bonn, Germany.

Mentoring: Masters Students (EPFL)

Varvara Karpova

Dates: Spring 2009

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

Thesis Topic: Why HZ-algebra spectra are differential graded algebras

Mentoring: Undergraduate Students (OSU)

Jacob Kirn

Dates: Summer 2018

Department/Institution: Mathematics/OSU

Summer Project Topic: Honors Mathematics Preparation: Topics in Analysis I

Kevin Idleman

Dates: Summer 2017

Department/Institution: Mathematics/OSU

Summer Project Topic: Honors Mathematics Preparation: Topics in Analysis I

Mentoring: Undergraduate Students (EPFL)

Cyril Becker and Rosalie Chevalley

Dates: Spring 2009

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

Mini Project Topic: Notion de propriété universelle dans le langage de la théorie des catégories

Lev Kiwi

Dates: Fall 2008

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

Semester Project Topic: Algèbres de Hopf

Florent Mayencourt

Dates: Fall 2008

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

Semester Project Topic: Noeuds et invariants de Vassiliev

Jean-Paul Wenger

Dates: Fall 2008

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

Semester Project Topic: Braid theory

Service: Administrative and Professional (OSU)

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, 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 reserved 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, setup 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, setup 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, setup 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, setup 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 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 re-

cruitment 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, setup 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.

Teaching: Undergraduate and Graduate (OSU)

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

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_∞ algebras and p -adic homotopy theory”.

University of Copenhagen, Workshop on E_n Operads in Differential Graded Algebra, November 18, 2008: “ E_∞ 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_∞ operads, E_∞ 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 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

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. Anageltveit, 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. Moller, 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. Zaharapol 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.

Other Service

Invited peer reviewer for:

- *Israel Science Foundation*, Jerusalem, Israel.
- *Shota Rustaveli National Science Foundation*, Tbilisi, Georgia.

Referee for:

- *Algebraic & Geometric Topology*
- *Homology, Homotopy and Applications*
- *Israel Journal of Mathematics*
- *Journal of Pure and Applied Algebra*
- *Proceedings of the American Mathematical Society*
- *Proceedings of the London Mathematical Society*

AMS Mathematical Reviews reviewer for papers in:

- *Advances in Mathematics*
- *Algebraic & Geometric Topology*
- *New York Journal of Mathematics*
- *Ricerche di Matematica*

Conferences Organized

Note: Details for these are elaborated above in Service.

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, 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.

Prizes

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
June 26, 2018