CONTACT INFORMATION

Department of Mathematics and Statistics
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RESEARCH INTERESTS

Algebraic topology, homotopy theory, and related fields.

EMPLOYMENT

Associate Professor, University of Regina, 2022–present.

Assistant Professor, University of Regina, 2018–2022.

Research Fellow, Universität Osnabrück, 2016–2018.

Postdoctoral Fellow, University of Western Ontario, 2013–2015.

Visiting Assistant Professor, University of Illinois at Urbana-Champaign, 2010–2013.

GUEST POSITIONS

Max-Planck-Institut für Mathematik Bonn, June–Aug. 2012, Sep.–Dec. 2015, and shorter visits.

EDUCATION

Ph.D. Pure Mathematics, Massachusetts Institute of Technology, 2006–2010. Advisor: Haynes R. Miller.

M.Sc. Mathematics, Université de Montréal, 2003–2005.

B.Sc. Mathematics, Université de Montréal, 2000–2003.

SELECTED PUBLICATIONS

Papers in refereed journals

- J.D. Christensen and M. Frankland. On good morphisms of exact triangles. *J. Pure Appl. Algebra* 226 (2022), no. 3, Paper no. 106846.
- H.J. Baues and M. Frankland. The DG-category of secondary cohomology operations. *Appl. Categ. Structures* 28 (2020), no. 6, 877–905.
- H.J. Baues and M. Frankland. Eilenberg–MacLane mapping algebras and higher distributivity up to homotopy. *New York J. Math.* 23 (2017), 1539–1580.
- J.D. Christensen and M. Frankland. Higher Toda brackets and the Adams spectral sequence in triangulated categories. *Algebr. Geom. Topol.* 17-5 (2017), 2687–2735.
- H.J. Baues and M. Frankland. 2-track algebras and the Adams spectral sequence. *J. Homotopy Relat. Struct.* 11 (2016), no. 4, 679–713.
- T. Barthel and M. Frankland. Completed power operations for Morava E-theory. *Algebr. Geom. Topol.* 15-4 (2015), 2065–2131.

- M. Frankland. Behavior of Quillen (co)homology with respect to adjunctions. *Homology Homotopy Appl.* 17 (2015), no. 1, 67–109.
- H.J. Baues and M. Frankland. The realizability of operations on homotopy groups concentrated in two degrees. *J. Homotopy Relat. Struct.* 10 (2015), no. 4, 843–873.
- M. Frankland. Moduli spaces of 2-stage Postnikov systems. *Topology Appl.* 158 (2011), 1296–1306.
- M. Frankland. Théorème de Künneth en homologie de Morse. *Ann. Sci. Math. Québec* 31 (2007), no. 1, 31–39.

Submitted papers

- I. Dokas, M. Frankland, and S. Ikonicoff. Quillen (co)homology of divided power algebras over an operad.
- M. Frankland, S. Martensen, and M. Thaule. Toda brackets in n-angulated categories.
- M. Frankland and D. Stanley. Multiparameter persistence modules in the large scale.
- M. Frankland and M. Spitzweck. Towards the dual motivic Steenrod algebra in positive characteristic. (Accepted pending revisions.)

TEACHING EXPERIENCE

Regina

- Homological Algebra (graduate).
- Abstract Linear Algebra (graduate).
- Commutative Algebra (graduate) ($\times 2$).
- Linear Algebra I ($\times 2$).
- Algebraic Topology (graduate) ($\times 2$).
- Matrix Theory.
- Topics in Topology (reading course) ($\times 2$).
- General Topology (graduate) ($\times 2$).
- Calculus II ($\times 3$).
- Euclidean Geometry ($\times 2$).
- Vector Calculus ($\times 2$).

Osnabrück

- Algebraische Topologie (graduate, in German).

Western Ontario

- Algebraic Topology (graduate).
- Advanced Calculus I.
- Methods of Finite Mathematics.
- Intermediate Calculus I.

Urbana-Champaign

- Homotopy Theory (graduate).
- General Topology (graduate).
- Calculus III.
- Abstract Linear Algebra.
- Intro Differential Equations ($\times 2$).
- Applied Linear Algebra.
- Elementary Linear Algebra.

SUPERVISION

Graduate students

- Manak Singh, Ph.D. student, 2023–present.
- Matthew Alexander, Ph.D. student, 2020–present.
- Arnaud Ngopnang Ngompe (cosupervised), Ph.D. student, 2020–present.
- Nimanthi Yaseema, M.Sc., 2020–2023.
- Michael Opadotun, M.Sc., 2019–2021.

Undergraduate research interns

- Aditya Dwarkesh, Mitacs Globalink, Summer 2023.
- Pranali Sohoni, Mitacs Globalink, Summer 2021; Honours Thesis, Fall 2021.
- Raveen Tehara, NSERC USRA, Summers 2021, 2022, and 2023.

SELECTED TALKS

- Session on Applied Topology, CMS Meeting, Saskatoon, June 2024.
- Mini-course on Persistent Homology, Saskatoon, May 2024.
- Alberta Topology Seminar, July 2023.
- University of Haifa Topology and Geometry Seminar, Dec. 2022.
- Canadian Geometry-Topology Seminar, Montreal, Nov. 2022.
- NTNU Topology Seminar, Trondheim, Oct. 2022.
- Foundational Methods in Computer Science Workshop, Kananaskis, June 2022.
- Session on Relative Homology and Persistence Theory, CMS Meeting, St. John's, June 2022.
- Session on Descent Methods, CMS Meeting, St. John's, June 2022.
- New Directions in Group Theory and Triangulated Categories online seminar, May 2022.
- Session on Categories and Topology, Mathematical Congress of the Americas, July 2021.
- Princeton University Algebraic Topology Seminar, March 2021.
- University of Calgary Peripatetic Seminar, March 2021.
- University of Melbourne Topology Seminar, Oct. 2020.
- Fields Institute Toric Topology Seminar, May 2020.
- Ohio State University Homotopy Theory Seminar, Feb. 2020.
- NTNU Topology Seminar, Trondheim, Nov. 2019.
- Equivariant Topology and Derived Algebra, NTNU Trondheim, July 2019.
- Universität Osnabrück Oberseminar Topologie, July 2019.
- Electronic Computational Homotopy Theory Seminar, Feb. 2019.
- University of Western Ontario Geometry & Topology Seminar, Feb. 2019.
- Session on Topology, CMS Meeting, Vancouver, Dec. 2018.
- University of British Columbia Topology Seminar, Dec. 2018.
- University of Washington Topology Seminar, Nov. 2018.
- Adam Mickiewicz University in Poznań Geometry and Topology Seminar, July 2018.
- Topology Meeting, University of Oslo, May 2018.
- Workshop on Homotopy Theory, Universität Regensburg, May 2018.
- University of Louisiana at Lafayette Mathematics Colloquium, March 2018.
- EPFL Topology Seminar, Lausanne, Oct. 2017.
- Homotopy Theory: Tools and Applications, UIUC, July 2017.
- Adam Mickiewicz University in Poznań Geometry and Topology Seminar, June 2017.
- Colloque GDR "Topologie algébrique et applications", Amiens, France, Oct. 2016.
- Combinatorial Structures in Geometry, Universität Osnabrück, Aug. 2016.
- University of Copenhagen Algebra/Topology Seminar, June 2016.
- Operations in Highly Structured Homology Theories, Banff, May 2016.
- Westfälische Wilhelms-Universität Münster Oberseminar Topologie, April 2016.

GRANTS AND FELLOWSHIPS

- PIMS Travel support for a visitor, Regina, 2022.
- PIMS Support for the University of Regina Topology Seminar, 2019–2020.
- NSERC Discovery Grant, 2019–present.
- NSERC Discovery Launch Supplement, 2019.
- PIMS Support for the Topology Mini-Conference, Regina, 2019.
- Grant from the DFG-SPP "Homotopy Theory and Algebraic Geometry" for the Workshop on Motivic and Equivariant Homotopy Theory, Osnabrück, 2017.
- FQRNT Postdoctoral Research Scholarship, 2011–2013.
- FQRNT Doctoral Research Scholarship, 2008–2009.
- NSERC Doctoral Postgraduate Scholarship, 2006–2008.
- NSERC Julie-Payette Master's Scholarship, 2003–2005.
- NSERC Undergraduate Student Research Award, Summers 2001 and 2002.

Awards and Prizes

- Merit Award for sustained performance, Regina, 2022.
- Bank of Montreal Scholarship, 2004.
- Governor General's Academic Medal (best undergraduate student), 2003.
- Jean-Maranda Prize (best graduating math major), 2003.
- Department of Mathematics Study Abroad Scholarship, Fall 2002.
- Maurice-L'Abbé Prize (best mid-program math major), 2002.

Service

Event organization

- Co-organizer of the Homotopy Theory Session at the CMS Winter Meeting, 2023.
- Co-organizer of the Conference on Algebraic Topology, MPIM Bonn, Oct. 2022.
- Co-organizer of the Homotopy Theory Session at the CMS Winter Meeting, Dec. 2020.
- Co-organizer of the Prairie Mathematics Colloquium, 2019–2023.
- Co-organizer of the Topology Mini-Conference, Regina, June 2019.
- Co-organizer of the Topology Session at the CMS Summer Meeting, Regina, June 2019.
- Organizer of the University of Regina Math & Stats Colloquium, 2019–2023.
- Organizer of the University of Regina Topology Seminar, 2018–present.
- Co-organizer of the Workshop on Motivic and Equiv. Homotopy Theory, Osnabrück, Oct. 2017.
- Co-organizer of the Fall 2016 NRW Topology Meeting in Osnabrück.

Committee work and academic service

- Math & Stats Graduate Chair, 2023–present.
- Mathematics Search Committee, 2022–2023.
- Ph.D. Committee of the Faculty of Graduate Studies and Research, 2022–present.
- Co-instructor of the Putnam training sessions, Regina, Fall 2020–2023.
- External examiner for one graduate student, 2021.
- NSERC Scholarships and Fellowships Selection Committee for Mathematical Sciences, 2019–2022.
- Member of the thesis committee for 6 graduate students, Regina, 2019–2023.
- Member of the Ph.D. commission for two graduate students, Osnabrück, 2016.

Refereeing

- Referee for the NSERC Discovery Grant program, 2021–2024.
- Reviewer for MathSciNet, 2015–present.
- Reviewer for Zentralblatt MATH, 2011–2018.
- Referee for: Advances in Mathematics; Algebraic & Geometric Topology; Compositio Mathematica; Foundations of Computational Mathematics; Higher Structures; Homology, Homotopy and Applications; International Mathematics Research Notices; Journal of Homotopy and Related Structures; Journal of Pure and Applied Algebra; Proceedings A; Proceedings of the LMS; Tbilisi Mathematical Journal; Theory and Applications of Categories.
- Referee for the Shota Rustaveli National Science Foundation of Georgia, 2011–2018.

Miscellaneous

Citizenship: Canadian.

Languages: Fluent in French and English; fluent in German (Goethe-Zertifikat C2).

Computer skills: Proficient in LaTeX. Some experience with Mathematica, Matlab, Maple, SageMath, Java, C++, C, Visual Basic, and html.

Memberships: American Mathematical Society, Canadian Mathematical Society, Association Mathématique du Québec.

References

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Teaching references

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