
Education

- Fall 2023 **Ph.D.**, Johns Hopkins University
Mathematics
- 2022-2023 **Program Associate**, SLMath (formerly MSRI)
- 2021-2022 **M.Sc.**, University of Toronto
Mathematics
- 2017–2021 **B.Sc.**, Western University
Honour's Specialization in Mathematics; minor in Computer Science.

Publications

- June 2023 **Nonexistence of colimits in naive discrete homotopy theory**, *Applied Categorical Structures*, 31 (2023), no.5, 41, 6 pp.
With C. Kapulkin and J. Kim
<https://arxiv.org/abs/2306.02219>
<https://link.springer.com/article/10.1007/s10485-023-09746-9>
- June 2023 **Calculus of Fractions for Quasicategories**, Submitted
With C. Kapulkin and Z. Lindsey
<https://arxiv.org/abs/2306.02218>
- June 2023 **Diagonal Lemma for Presheaves on Eilenberg-Zilber Categories**, Submitted
With C. Kapulkin and L.-Z. Wong
<https://arxiv.org/abs/2306.02217>
- December 2022 **Cofibration category of digraphs for path homology**, *Algebraic Combinatorics* (to appear)
with B. Doherty, C. Kapulkin, M. Opie, M. Sarazola, and L.-Z. Wong
<https://arxiv.org/abs/2212.12568>
- July 2022 **The Hurewicz theorem for cubical homology**, *Mathematische Zeitschrift*, 305, 62 (2023)
With C. Kapulkin and A. Tonks
<https://arxiv.org/abs/2207.12500>
<https://link.springer.com/article/10.1007/s00209-023-03352-0>

- February 2021 **Cubical setting for discrete homotopy theory, revisited**, Submitted
With C. Kapulkin
<https://arxiv.org/abs/2202.03516>
- February 2021 **Homotopy groups of cubical sets**, *Expositiones Mathematicae*, 41 (2023) 125518, no. 4, 55 pp.
With C. Kapulkin
<https://arxiv.org/abs/2202.03511>
<https://www.sciencedirect.com/science/article/pii/S0723086923000944>
- January 2021 **2-adjoint equivalences in homotopy type theory**, *Logical Methods in Computer Science*, (2021), no. 1, Paper No. 3, 9 pp.
With J. Chang, C. Kapulkin, and R. Sandford
<https://arxiv.org/abs/2008.12433>
<https://lmcs.episciences.org/7124>

Talks

Nonexistence of colimits in naive discrete homotopy theory

January 2024 Joint Mathematics Meeting, San Francisco, California

Calculus of fractions for quasicategories

December 2023 Canadian Mathematical Society Winter Meeting, Montreal, Quebec

October 2023 Geometry, Topology and Physics seminar (online), NYU Abu Dhabi

March 2023 Algebraic Topology seminar, University of California, Los Angeles

Hurewicz Theorem in Discrete Homotopy Theory

November 2023 9th Mexican Workshop on Applied Geometry and Topology, Centro de Investigación en Matemáticas (CIMAT)

Cubical Setting for Discrete Homotopy Theory

April 2023 Math & Statistics Colloquium, Reed College

April 2023 Algebraic & Geometric Topology Seminar, University of Nevada-Reno

March 2023 AIM Workshop: Discrete and Combinatorial Homotopy Theory

November 2022 Berkeley Seminar, Topos Institute

<https://youtu.be/Ns1NBLMddps?si=ILsdvwPuKDbt-o7p>

October 2022 AMS Fall Eastern Sectional Meeting, University of Massachusetts Amherst

May 2022 Ontario Combinatorics Workshop, University of Waterloo

Formalizing 2-adjoint equivalences in homotopy type theory

August 2020 Western Homotopy theory seminar, University of Western Ontario
https://youtu.be/BIqhGYoo_PU?si=bTN4uUfenqLyasP0

Formal verification of Mathematics

August 2020 Canadian Undergraduate Mathematics Conference (online)
<https://youtu.be/LCW682zcEVs?si=r5530uP66Ri1dHTU>

Scholarships and Awards

Summer 2021 **NSERC Undergraduate Student Research Award**, *Cubical Methods in Discrete Homotopy Theory*, Western University

Summer 2020 **NSERC Undergraduate Student Research Award**, *2-Adjoint Equivalences in HoTT*, Western University

2018-2021 **Dean's Honor List**

September 2017 **Western Scholarship of Excellence**

Teaching Experience

Teaching Assistant

Winter 2022 **Math Learning Centre**, University of Toronto

Winter 2022 **Engineering Calculus 2**, University of Toronto

Fall 2021 **Engineering Linear Algebra**, University of Toronto

Other Activities

December 2023 **Oberwolfach Workshop 2350: Geometric, Algebraic, and Topological Combinatorics**, *Participant*, Oberwolfach Research Institute for Mathematics

March 2023 **AIM Workshop: Discrete and Combinatorial Homotopy Theory**, *Participant*, San Jose, California

June 2022 **Higher Categories and Categorification, Part Two**, *Participant*, MSRI

February 2020 **Higher Categories and Categorification**, *Research Visit*, MSRI

October 2019 **Midwest Homotopy Type Theory Seminar**, *Conference*, University of Michigan