
Education

- 2023–Present **Ph.D. in Mathematics**, Johns Hopkins University
(Expected 2029)
- 2022–2023 **Program Associate**, SLMath (formerly MSRI)
- 2021–2022 **M.Sc. in Mathematics**, University of Toronto
- 2017–2021 **B.Sc.**, Western University, Mathematics (Honours Spec.); Comp. Sci. (Minor)

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*, 7 (2024), no. 2, 475–514
with B. Doherty, C. Kapulkin, M. Opie, M. Sarazola, and L.-Z. Wong
<https://arxiv.org/abs/2212.12568>
<https://alco.centre-mersenne.org/articles/10.5802/alco.341/>
- 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**, *Compositio Mathematica* (to appear)
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

- November 2024 Topology and Geometry seminar, University of Florida
January 2024 Joint Mathematics Meeting, San Francisco, California

Calculus of fractions for quasicategories

- March 2024 AMS Spring Southeastern Sectional Meeting, Florida State University
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

- December 2023 Geometric, Algebraic, and Topological Combinatorics, Mathematisches Forschungsinstitut Oberwolfach
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

2024-2027 **Canada Graduate Scholarship-Doctoral (CGS D)**

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**, *Workshop Participant*, Oberwolfach Research Institute for Mathematics

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

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

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