Isaac Sundberg

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updated
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Academic Positions

Postdoctoral fellow — Max-Planck-Institut für Mathematik (MPIM), Bonn, Germany   2022-24

Education

Ph.D. Mathematics — Bryn Mawr College, Bryn Mawr, Pennsylvania, USA   2022
  Dissertation: Khovanov homology & uniqueness of surfaces in the 4-ball
  Advisor: Paul Melvin

M.A. Mathematics — Bryn Mawr College, Bryn Mawr, Pennsylvania, USA   2018
  Thesis: On fibering 3-manifolds

B.S. Mathematics — University of Wisconsin La Crosse, La Crosse, Wisconsin, USA   2016

Research Interests

Low-dimensional topology: exotic phenomena in 4-dimensions; isotopy of surfaces in 4-manifolds; Khovanov homology; link homology theories; concordance and sliceness; knots and links.

Publications & preprints

Seifert surfaces in the 4-ball — with Kyle Hayden, Maggie Miller, and JungHwan Park
  arXiv:2205.15283 (2023)

Khovanov homology and exotic surfaces in the 4-ball — with Kyle Hayden
  To appear in Crelles Journal (Journal für die reine und angewandte Mathematik) (2023)

Relative Khovanov-Jacobsson classes — with Jonah Swann
  Algebraic & Geometric Topology, 22-8 (2022), 3983-4008

Multiplication operators on weighted Banach spaces of a tree — with Robert F. Allen
  Bulletin of the Korean Mathematical Society, 54:3 (2017), 747-761

Software

KhCob, a program for calculating the induced maps on Khovanov homology
  Python + SymPy (in preparation)

KhNoDe, a program for determining the nontriviality of Khovanov homology classes
  Python + SymPy (2022)

Invited Talks

2023 — MPIM Oberseminar • Heidelberg Symplectic Topology Seminar • Hamburg Research Seminar on Quantum Topology and Categorification (QTCat)

2022 — MPIM Low-dimensional Topology Seminar (3 talk mini-series) • Rutgers-Newark Colloquium • Philadelphia Area Contact/Symplectic/Topology (PATCH) Seminar • MPIM Low-dimensional Topology Seminar • DMV Jahrestagung Berlin • Princeton Topology Seminar • Duke Geometry & Topology Seminar

2021 — University of Oregon Topology Seminar • MIT Geometry & Topology Seminar • Columbia Geometric Topology Seminar • Philadelphia Area Contact Topology Seminar (5 talk mini-series) • Nearly Carbon Neutral Geometric Topology Conference • AIM Research Community in 4-dimensional Topology

Teaching Positions

Max-Planck-Institut für Mathematik — Instructor

Slice Knots and Knot Concordance (with Arunima Ray)	2023

Bryn Mawr College — Instructor

Math 201: Transitions to Higher Mathematics (with Lisa Traynor)	2022
Math 201: Transitions to Higher Mathematics (with Lisa Traynor)	2021
Math 101: Calculus I	2020

Bryn Mawr College — Teaching Assistant

Math 303: Abstract Algebra I (2 sections)	2019
Math 205: Theory of Probability	2019
Math 312: Topology	2018
Math 304: Abstract Algebra II	2018
Math 303: Abstract Algebra I	2017
Math 295: History of Mathematics	2017
Math 303: Abstract Algebra I (2 sections)	2016

University of Wisconsin La Crosse — Tutor

Murphy Learning Center	2013-16

Awards & Honors

National Science Foundation

MSPRF proposal recommended for funding (declined for lack of funding)	2023

Bryn Mawr College

Community Building Honor Roll	2019, 22
Doris Sill Carland Award for Excellence in Teaching	2021
Research Assistantship	2020, 21
Convocation Speaker Representing the Graduate Student Association	2018
McPherson Graduate Award for Excellence	2018

UW La Crosse

Department of Mathematics: Outstanding Service Award	2016
SIAM Award for Outstanding Efforts & Accomplishments in the Chapter	2016

Service & Outreach

Mentor — Alejandro Garcías Rivas (M.S.), in progress	2023-24
Project Leader — MPIM, Summer Student Intern Program (with Luciana Balsualdo Bonatto)	2023
Referee — Transactions of the American Mathematical Society	2021-22
Committee Member Prelim Restructuring Committee, Bryn Mawr College	2021-22
Mentor — Directed Reading Program, Bryn Mawr College	2019-20
Graduate Student Association — Bryn Mawr College	2017-20

Co-chair (2017-19) • Representative to Graduate Council (2017-19) • Committee Chair for Diversity, Equity, & Inclusion (2017-19) • Departmental Representative (2019-20)

President — AMS Graduate Student Chapter, Bryn Mawr College	2018-20
President — Mathematics & Statistics Club, UW La Crosse	2015-16
Tutor/Staff — FastTrack Remedial Mathematics Camp, UW La Crosse	2015
Staff — Girls in Science Day Camp, UW La Crosse	2015

Organization

Topic Group Organizer — Nearly Carbon Neutral Geometric Topology (with Alex Manchester)	2023
Founder/Organizer — Graduate Research Seminar	2019-22
Co-founder/Co-organizer — Directed Reading Program, Bryn Mawr College (with Aisha Mechery)	2019-20
Organizer — Professional Development Seminar organizer	2018-19

Contributed Talks, Conferences, & Workshops

2023 — MPIM Open Problem Seminar • Morphisms in Low Dimensions (MFO)

2022 — Topology in Dimension 4.5 (BIRS) • MPIM Topology Seminar • Algebra and Low-Dimensional Topology Minisymposium, DMV Jahrestagung (Freie Universität Berlin) • Braids in Low-Dimensional Topology (ICERM)

2021 — Tech Topology Summer School on 4-manifolds • Nearly Carbon Neutral Geometric Topology Conference

2020 — Nearly Carbon Neutral Geometric Topology Conference

2019 — Graduate Student Topology and Geometry Conference (UIUC) • EPaDel MAA Section Meeting • Graduate Student Conference in Algebra, Geometry, & Topology (Temple)

2018 — MSRI Summer Graduate School on H-Principles (Tambara Institute/University of Tokyo) • Graduate Student Conference in Algebra, Geometry, & Topology (Temple) • Summer Geometry/Topology RTG mini-conference (Princeton) • Topology Student Workshop (Georgia Tech) • EPaDel MAA Section Meeting

2016 — AMS Session on Undergraduate Research (JMM Seattle)