

# ISAAC SUNDBERG

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## Academic Positions

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Postdoctoral fellow, Max-Planck-Institut für Mathematik (MPIM), Bonn, Germany	2022-2024
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## Education

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Ph.D. Mathematics, Bryn Mawr College, Bryn Mawr, Pennsylvania, USA	2022
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Thesis: *Khovanov homology & uniqueness of surfaces in the 4-ball*

M.A. Mathematics, Bryn Mawr College, Bryn Mawr, Pennsylvania, USA	2018
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B.S. Mathematics, University of Wisconsin La Crosse, La Crosse, Wisconsin, USA	2016
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## Research Interests

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

## Publications & preprints

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1. *Seifert surfaces in the 4-ball*, with Kyle Hayden, Seungwon Kim, Maggie Miller, and JungHwan Park  
Submitted, arXiv:2205.15283 (2023)

2. *Khovanov homology and exotic surfaces in the 4-ball*, with Kyle Hayden  
Submitted, arXiv:2108.04810 (2023)

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

4. *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

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

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

## Invited Talks

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Heidelberg Symplectic Topology Seminar	TBD 2023
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MPIM Oberseminar	TBD 2023
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Hamburg Research Seminar on Quantum Topology and Categorification (QTCat)	Jan 2023
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MPIM Low-dimensional Topology Seminar, 3 talk mini-series	Nov 2022
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Rutgers-Newark Colloquium	Nov 2022
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Philadelphia Area Contact/Symplectic/Topology (PATCH) Seminar	Nov 2022
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MPIM Low-dimensional Topology Seminar	Sep 2022
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DMV Jahrestagung 2022	Sep 2022
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Princeton Topology Seminar	Apr 2022
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Duke Geometry & Topology Seminar	Jan 2022
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University of Oregon Topology Seminar	Nov 2022
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## Invited talks (continued)

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MIT Geometry & Topology Seminar	Sep 2021
Columbia Geometric Topology Seminar	Sep 2021
Philadelphia Area Contact Topology (PACT) Seminar, 5 talk mini-series	Sept-Oct 2021
Nearly Carbon Neutral Geometric Topology Conference	Jun 2021
AIM Research Community in 4-dimensional Topology	Apr 2021
UWL Mathematics & Statistics Club, UW La Crosse	Nov 2018

## Invited Conferences & Workshops

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Morphisms in Low Dimensions, Mathematisches Forschungsinstitut Oberwolfach (MFO)	Jan 2023
Topology in Dimension 4.5, Banff International Research Station (BIRS)	Oct 2022
Algebra and Low-Dimensional Topology Minisymposium, DMV Jahrestagung, Berlin	Sep 2022

## Contributed Talks

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MPIM Open Problem Seminar	Apr 2023
Morphisms in Low Dimensions, MFO	Jan 2023
Topology in Dimension 4.5 Workshop, BIRS	Oct 2022
MPIM Topology Seminar	Sep 2022
Graduate Student Topology and Geometry Conference, UI Urbana-Champaign	Mar 2019
EPaDel MAA Section Meeting, King's College	Mar 2019
EPaDel MAA Section Meeting, Temple University	Mar 2018
AMS Session on Undergraduate Research, JMM Seattle	Jan 2016

## Additional Conference & Workshop Participation

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Braids in Low-Dimensional Topology, ICERM	Apr 2022
Tech Topology Summer School on 4-manifolds	Jul 2021
Nearly Carbon Neutral Geometric Topology Conference	Jun 2020
Graduate Student Conference in Algebra, Geometry, & Topology, Temple University	Jun 2018, 2019
MSRI Summer Graduate School on H-Principles, Tambara Institute, University of Tokyo	Jun-Jul 2018
Summer Geometry/Topology RTG mini-conference, Princeton University	Jun 2018
Topology Student Workshop, Georgia Institute of Technology	Jun 2018

## Teaching Positions

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<b>Max-Planck-Institut für Mathematik</b> , Instructor	
Slice Knots and Knot Concordance (with Arunima Ray),	Sp 2023
<b>Bryn Mawr College</b> , Instructor	
Math 201: Transitions to Higher Mathematics (with Lisa Traynor)	Sp 2022
Math 201: Transitions to Higher Mathematics (with Lisa Traynor)	Sp 2021
Math 101: Calculus I	Sp 2020
<b>Bryn Mawr College</b> , Teaching Assistant	
Math 303: Abstract Algebra I (2 sections)	Fa 2019
Math 205: Theory of Probability	Sp 2019
Math 312: Topology	Fa 2018
Math 304: Abstract Algebra II	Sp 2018

## Teaching Positions (continued)

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### **Bryn Mawr College**, Teaching Assistant

Math 303: Abstract Algebra I Fa 2017

Math 295: History of Mathematics Sp 2017

Math 303: Abstract Algebra I (2 sections) Fa 2016

### **University of Wisconsin La Crosse**, Tutor

Murphy Learning Center 2013-2016

## Service & Outreach

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**Referee**, Transactions of the American Mathematical Society 2021-2022

**Prelim Restructuring Committee**, Bryn Mawr College, Graduate representative 2021-2022

**Graduate Student Association**, Bryn Mawr College 2017-2020

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

**Directed Reading Program**, Bryn Mawr College, Co-founder & Co-organizer 2019-2020

**AMS Graduate Student Chapter**, Bryn Mawr College, President 2018-2020

**Mathematics & Statistics Club**, UW La Crosse, President 2015-2016

**FastTrack Remedial Mathematics Camp**, UW La Crosse, Tutor and staff 2015

**Girls in Science Day Camp**, UW La Crosse, Teaching assistant and staff 2015

## Seminar Organization

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Bryn Mawr College *Graduate Research Seminar* 2019-2022

Bryn Mawr College *Professional Development Seminar* 2018-2019

## Awards & Honors

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National Science Foundation *MSPRF proposal recommended for funding (but not funded)* 2023

Bryn Mawr College *Community Building Honor Roll* 2019, 2022

Bryn Mawr College *Doris Sill Carland Award for Excellence in Teaching* 2021

Bryn Mawr College *Research Assistantship* Fa 2020, Sp 2021

Bryn Mawr College *Convocation Speaker Representing the Graduate Student Association* 2018

Bryn Mawr College *McPherson Graduate Award for Excellence* 2018

UW La Crosse *Department of Mathematics: Outstanding Service Award* 2016

UW La Crosse *SIAM Award for Outstanding Efforts & Accomplishments in the Chapter* 2016