Hannah Schwartz
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Positions

- **Postdoctoral Research Associate** Fall 2020 - Present
  Princeton University
  Princeton, NJ
- **Postdoctoral Fellow** Fall 2019 - Summer 2020
  Max-Planck-Institut für Mathematik
  Bonn, Germany

Education

- **Bryn Mawr College**
  Bryn Mawr, PA

  Doctor of Philosophy Candidate, Mathematics 2015 - 2019
  - ◇ Advisor: Paul Melvin
  - ◇ Thesis:
    Exotic Phenomena in Dimension Four
  - ◇ Comprehensive examination topics: Algebra, Analysis, & Topology

  Master of Arts, Mathematics 2013 - 2015
  - ◇ Advisor: Paul Melvin
  - ◇ Thesis:
    On and Off the Grid: An Exploration of Heegaard Floer Homology
- **Occidental College**
  Los Angeles, CA

  Bachelor of Arts, Mathematics 2009 - 2013
  - ◇ Graduated Cum Laude with honors

Awards, Grants & Honors

Research grants:

- AIM SQuaRE Grant, American Institute of Mathematics . . . . . 2019 - 2021
  Project titled *Studying knot concordance via branched covers of* S^4
  Joint with Ryan Blair, Patricia Cahn, Alexandra Kjuchukova, Kent Orr, and Arunima Ray
- AIM SQuaRE Grant, American Institute of Mathematics 2017
  Project titled *Stabilization in* 4*-dimensional topology*
  Joint with Dave Auckly, Hee Jung Kim, Paul Melvin, and Danny Ruberman
- Bryn Mawr College Research Fellowship . . . . . Fall 2016, Fall 2018 - Spring 2019

Academic Awards and Honors:

Community Building Honor Roll, Bryn Mawr College . . . . . Spring 2019
Carland Fellowship . . . . . Fall 2017 - Spring 2018
The Dean's Certificate in Pedagogy . . . . . Spring 2016
Bryn Mawr College Tuition Scholarship . . . . . 2013 - 2019
Benedict Freedman Senior Prize in Mathematics, Occidental College 2013
Benedict Freedman Prize for Mathematical Promise, Occidental College 2013

Papers

- H. Schwartz. *Duals of non-zero square*, arxiv.org/abs/2012.05939, December 2020 (submitted).
- P. Naylor and H. Schwartz. *Gluck twisting roll spun knots*, arXiv:2009.05703, October 2020 (submitted).
- J. Joseph, M. Klug, B. Ruppik, and H. Schwartz. *Unknotting numbers of 2-spheres in the 4-sphere*, arXiv:2007.13244, July 2020 (submitted).
- P. Melvin and H. Schwartz. *Higher order corks*, Invent. Math. (2020). https://doi.org/10.1007/s00222-020-01009-x
- H. Schwartz. *Equivalent non-isotopic spheres in 4-manifolds*, Journal of Topology 12, (2019).
- D. Auckly, H. J. Kim, P. Melvin, D. Ruberman, and H. Schwartz. *Isotopy of surfaces in 4-manifolds after a single stabilization*, Advances in Mathematics 341, (2019).
- H. Schwartz. *A note on the complexity of h-cobordisms*, arxiv.org/abs/1811.02753, November 2018 (to appear in AGT).
- R. Naimi, E. Pavelescu, and H. Schwartz. *Deleting an edge of a 3-cycle in an intrinsically knotted graph gives an intrinsically linked graph*, J. Knot Theory and its Ramifications 23, (2014).

Research Presentations

- **Isotopy vs. homotopy for disks with a common dual** Fall 2020
  Topology Seminar
  Univeristy of California, San Diego
- **Isotopy vs. homotopy for disks with a common dual** Fall 2020
  AMS Special Session on Knotted surfaces and Concordances
  Online conference
- **Isotopy vs. homotopy for disks with a common dual** Fall 2020
  Topology Seminar
  Princeton University, Princeton, NJ
- **Embedding concordances with Freedman and Quinn** Summer 2020
  Virtual Trisections Seminar
  Online Seminar

- **Regular homotopy and Gluck twists** Spring 2020
  Nearly Carbon Neutral Geometry Topology (NCNGT)
  Online Conference

- **Computing the Dax invariant– a hands on approach** Spring 2020
  Geometry Topology Graduate and Postdoc Seminar (GT GAPS)
  Online Seminar

- **Obstructing isotopies between surfaces in four manifolds** Spring 2020
  Geometry/Topology Seminar
  Oxford University, *Oxford, England*

- **Obstructing isotopies between surfaces in four manifolds** Fall 2019
  Geometry/Topology Seminar
  Cambridge University, *Cambridge, England*

- **Obstructing isotopies between surfaces in four manifolds** Fall 2019
  Geometry/Topology Seminar
  University of Glasgow, *Glasgow, Scotland*

- **Smoothly exotic spheres in 4-manifolds** Fall 2019
  Workshop on 4-manifolds
  MPIM, *Bonn, Germany*

- **"Exotic" spheres in four manifolds** Summer 2019
  4-manifolds: Confluence of High and Low Dimensions
  Fields Institute, *Toronto, Canada*

- **"Exotic" spheres in four manifolds** Summer 2019
  Knot Concordance and Low Dimensional Manifolds
  Le Croisic, France

- **Equivalent non-isotopic spheres in 4-manifolds** Spring 2019
  Geometry/Topology Seminar
  University of Pennsylvania, *Philadelphia, PA*

- **Using 2-torsion to obstruct topological isotopy** Spring 2019
  Geometry/Topology Seminar
  Georgia Tech, *Atlanta, GA*

- **Using 2-torsion to obstruct topological isotopy** Winter 2019
  AMS Special Session on Women in Topology
  Joint Math Meetings, *Baltimore, MD*

- **Using 2-torsion to obstruct topological isotopy** Fall 2018
  Geometry/Topology Seminar
  Duke University, *Durham, NC*

- **Using 2-torsion to obstruct topological isotopy** Fall 2018
  Conference on "Knotted surfaces in 4-manifolds"
  University of Massachusetts (Amherst), *Amherst, MA*

- **Using 2-torsion to obstruct topological isotopy** Fall 2018
  MPIM Topology Seminar
  Max Planck Institute for Mathematics, *Bonn, Germany*

- **Using 2-torsion to obstruct topological isotopy** Fall 2018
  Geometry/Topology Seminar
  University of California (Davis), *Davis, CA*

- **Higher Order Corks and Exotic R4s** Summer 2018
  The topology and geometry of low-dimensional manifolds:
  a celebration of the mathematics of Bob Gompf
  University of Texas at Austin, *Austin, TX*

- **The Presence of 2-torsion** Summer 2018
  Low-dimensional topology and its interactions with symplectic geometry
  RTG mini-conference
  Princeton University, *Princeton, NJ*

- **Diffeomorphism vs. isotopy in 4-manifolds (a work in progress)** Spring 2018
  Philadelphia Area Contact/Topology (PACT) Seminar
  Bryn Mawr College, *Bryn Mawr, PA*

- **My Second Favorite Theorem** Fall 2017
  Philadelphia Area Contact/Topology (PACT) Seminar
  Bryn Mawr College, *Bryn Mawr, PA*

- **One (stabilization) is Enough** Fall 2017
  Topology Seminar
  Boston College, MA

- **One is Enough** Fall 2017
  Topology Seminar
  University of Virginia, VA

- **One is Enough** Fall 2017
  Topology Seminar
  University of Nebraska (Lincoln), NE

- **Finite Order Corks** Summer 2017
  Low Dimensional Topology and Gauge Theory Workshop
  Casa Matemática Oaxaca (CMO), Mexico

- **Finite Order Corks** Spring 2017
  Graduate Student Topology Conference
  Michigan State, MI

- **Corks and Smooth Structures on 4-manifolds** Spring 2017
  Tetrahedral Geometry/Topology Seminar (TGTS)
  Elizabethtown College, Franklin and Marshall College, Lebanon Valley College, and Millersville University, PA

- **On Freedman's Disk Theorem** Fall 2016
  Philadelphia Area Contact/Topology (PACT) Seminar
  Bryn Mawr College, *Bryn Mawr, PA*

- **An Introduction to Heegaard Floer Homology** Fall 2014
  Philadelphia Area Contact/Topology (PACT) Seminar
  Bryn Mawr College, *Bryn Mawr, PA*

Talks given for a general audience:

- **Homotopy, concordance, and isotopy in dimension 4** Fall 2020
  New Faculty Talk
  Princeton University, Princeton, NJ
- **New Guests at the MPIM** Fall 2019
  MPI-Oberseminar
  Max Planck Insitute for Mathematics, *Bonn, Germany*
- **Using knots to build 3-dimensional spaces** Spring 2019
  Math Club
  Penn State Brandywine, *PA*
- **Lightning Talk: How to draw a 4-dimensional space** Spring 2018
  Graduate School of Arts and Sciences (GSAS) Research Symposium
  Bryn Mawr College, *Bryn Mawr, PA*
- **Introduction to Knot Theory** Fall 2017
  Undergraduate Math Seminar
  Albright College, PA
- **The Wizardry of Whitney's Theorem** Spring 2014
  EPaDel Conference
  University of Scranton, *Scranton, PA*
- **Not all Tangles are Epic** Spring 2014
  Distressing Math Collective
  Bryn Mawr College, *Bryn Mawr, PA*
- **One Lovely Family (of Graphs)** Fall 2013
  Distressing Math Collective
  Bryn Mawr College, *Bryn Mawr, PA*

Funded Participation in Conferences and Workshops

- **Winter Braids X** February, 2020
  Centro de Ricerca Matematica Ennio de Giorgi, *Pisa, Italy*
- **Unifying 4-dimensional knot theory** November, 2019
  Banff International Research Station (BIRS), *Banff, Canada*
- **Invited Visitor** October, 2018
  Max Planck Institute, *Bonn, Germany*
- **Low Dimensional Topology and Gauge Theory Workshop** August, 2017
  Casa Matemática Oaxaca (CMO), *Oaxaca, Mexico*
- **Trisections and Low-Dimensional Topology** March, 2017
  American Institute of Mathematics (AIM), *San Jose, CA*
- **4-Manifolds and Knot Concordance** October, 2016
  Max Planck Institute, *Bonn, Germany*

- **Visiting Graduate Student** Fall 2016
  IAS, *Princeton, NJ*
- **Workshop on Flavours of Gauge Theory** May, 2016
  The Fields Institute, *Toronto, Canada*
- **Combinatorial Link Homology Theories, Braids, and Contact Geometry** August, 2014
  Institute for Computational and Experimental Research in Mathematics (ICERM), *Providence, RI*
- **Association for Women in Mathematics Research Symposium** April, 2015
  University of Maryland, *College Park, MD*
- **Summer Program for Women in Mathematics** Summer 2012
  George Washington University, *Washington, D.C.*

Teaching Experience

- **Instructor, Princeton University** Fall 2020-Spring 2021

  MAT103:Calculus I

  MAT175: Multivariable Calculus for Econ
- **Calculus Workshop Organizer, Bryn Mawr College** Fall 2018

  Taught a series of trigonometry and logarithm review workshops
- **Instructor, Bryn Mawr College** Spring 2018

  Calculus II
- **Teaching Assistant, Bryn Mawr College** 2013 – 2017

  Real Analysis II

  Real Analysis I

  Number Theory

  Topology

  Linear Algebra

  Multivariable Calculus
- **Teaching Assistant, Center for Talented Youth, Haverford College** 2014

  Class: Geometry through Art
- **Teaching Assistant, Center for Talented Youth, University of California, Santa Cruz** 2013

  Class: Geometry through Art
- **Peer Math Adviser** 2011 - 2013

  Occidental College

Service

- **Referee**

  Duke Mathematical Journal

  Journal of Topology

  International Mathematics Research Notices

  Michigan Mathematical Journal

- **Co-organizer** Spring 2021

  AIM 4-dimensional topology (online) research community

- **Volunteer with Prison Teaching Initiative (PTI) of Princeton University** Spring 2021

  Assisted with preparation of algebra class materials

- **Association for Women in Mathematics (AWM) Representative** March 2018

  Girl Scout STEM Expo

- **Organizer** April 2017

  Graduate School of Arts and Sciences (GSAS) Research Symposium

- **GSAS Math Department Representative** Fall 2016 - Spring 2017

  Bryn Mawr College

- **Math Awareness Week Organizer, Bryn Mawr Math Department**

  Organized *Math Pictionary* event Spring 2016

  Organized *Mathematical Magic* event Spring 2017

- **Graduate Recruiting** January 2014, 2015

  Joint Math Meetings

- **Mentor for 6th Grade Math Team** Spring 2013

  Annandale Elementary School, Los Angeles, CA

Computer Skills

- Programming Languages
  - Experienced with LaTeX
  - Familiar with Mathematica