

# Paul Melvin

November 2023

## Curriculum Vitae

Department of Mathematics  
Bryn Mawr College  
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## Research Interests

Geometric and Quantum Topology

## Education

### Degrees

Ph.D. in Mathematics, University of California, Berkeley, May 1977

Thesis: Blowing up and down in 4-manifolds Advisor: Robion Kirby

B.A. in Mathematics, Haverford College, May 1971

### Fellowships

Woodrow Wilson 1971-72 (honorary graduate fellowship)

National Science Foundation 1971-74 (graduate fellowship)

## Employment

Bryn Mawr College	Professor	1992–present
	On the Hale Chair	2000–08
	Department Chair	2011–14, 2005–06, 1998–99, 1993–96
	Associate Professor	1987–92
	Assistant Professor	1981–87
U.C. Santa Barbara	Visiting Assistant Professor	1979–81
U.W. Madison	Assistant Professor	1977–79

## Visiting Positions

Stanford University (Palo Alto)	Visiting Professor	2020 (Fall–remote)
Institute for Advanced Study (Princeton)	Visitor	2016 (Fall)
Math. Sci. Research Institute (Berkeley)	Member	2009-10
Institute for Advanced Study (Princeton)	Member	2002–03
Math. Sci. Research Institute (Berkeley)	Research Professor	1996–97

Newton Institute (Cambridge, England)	SERC Fellow	1992(Fall)
U.C. Berkeley	Research Associate	1989(Spring)
Stanford University (Palo Alto)	Visiting Assoc. Professor/Scholar	1988-89/ 1995(Summer)
University of Pennsylvania	Visiting Scholar	1985-86

## Grants

### AmericanInstituteofMathematics

#### SQuaRE Grants:

- Trisections, Knotted Surfaces, and Symplectic 4-Manifolds (2018-24)
- Stabilization in 4-dimensional topology (2014-17)
- Augmentations, rulings, and generating families (2008-13)

### MellonFoundation

- Trico Faculty Forum Seed Grant (2017-18)
- PACT Seminar Seed Grants (2014-17)
- Faculty-Student Seminar in Topology (2005-06)
- Tri-College Contact Seminar (2004-05)

### NationalScienceFoundation

#### Research Grants:

- Topological invariants of 3 and 4-manifolds (FRG: 2003-06)
- Quantum invariants of 3-manifolds (1992-95)
- 3-manifold invariants from quantum theory (1991-92)
- Transformation groups on 3 and 4-manifolds (1981-83)
- 4-manifolds and bordism of diffeomorphisms (1978-79)

#### Conference Grants:

- Oxtoby Centennial Conference (at Bryn Mawr, October 2010)
- Low-dimensional topology (at MSRI, June 1998)

### BrynMawrCollege

#### Sabbatical Leaves:

- Enhanced Sabbatical (1996-97)
- Junior Faculty Research Leave (1985-86)

#### Faculty Research:

- Research and Equipment Grants (1996-97, 1992-93, 1990-91)

## Professional Service

- PCMI (Park City Mathematics Institute) Steering Committee (2018-present)

## Publications

1. Blowing up and down in 4-manifolds (UC Berkeley PhD Thesis), ProQuest LLC (1977), 1-73.
2. Slice knots and property R (with R. Kirby), *Invent. Math.* **45**(1978), 57-59.
3. Bordism of Diffeomorphisms, *Topology* **18**(1979), 173-175.
4. On 4-manifolds with singular torus actions, *Math. Ann.* **256**(1981), 255-276.
5. Tori in the diffeomorphism groups of simply connected 4-manifolds, *Math. Proc. Camb. Phil. Soc.* **91**(1982), 305

23. Canonical framings for 3-manifolds (with R. Kirby), *Turk. J. of Math.* **23** (1999), 89-115, (arXiv:9903056); also in: *Proc. Gokova Geometry-Topology Conf.* 1998.
24. The  $E_8$ -manifold, singular fibers and handlebody decompositions (with R. Kirby), *Proceedings of the Kirby Fest, Geometry & Topology Monographs* **2** (1999), 233-258 (arXiv:9911253).
25. Finite type invariants of 3-manifolds (with T. Cochran),

### Other Manuscripts

- 42. Milnor's Triple Linking Number and Massey Products, 2012unpublished.
- 43. In nite families of homologous 2-spheres in 4-manifolds (with D. Auckly, H-J. Kim and D. Ruberman), 2018unpublished.
- 44. Spherically fertile 4-manifolds (with D. Auckly, H-J. Kim and D. Ruberman), in preparation.

### Invited Lectures

#### ColloquiaandSeminars.

UC Santa Barbara Topology Seminar (October 2023) "Spherically fertile 4-manifolds"

Penn Geometry/Topology Seminar (February 2023) "Homologically fertile 4-manifolds"

Philadelphia PACT Seminar (February 2023, series of four talks) "Homologically fertile 4-manifolds"

Philadelphia PACT Seminar (September 2022) "FJ/F3 9.963 T9o9 Tf[-1u]TJ/F2 9.963 Tf()Tj/F3 9.963 Tf()

Mathematical Sciences Research Institute PlayGround (February 2010) "Amphicheiral links"  
Berkeley Math Circle (February 2010) "Enhanced linking"  
Rice University Colloquium (December 2009) "From asteroids to bicycles"  
San Francisco State University Colloquium (November 2009) "From asteroids to bicycles"  
Claremont Colleges Topology Seminar (November 2009) "Degree formulas for higher order linking"  
Joint Caltech/UCLA/USC Topology Seminar (Nov 2009) "Degree formulas for higher order linking"  
University of California, Berkeley (Oct 2009) "Degree formulas for higher order linking"  
University of Pennsylvania (Apr 2009) "Applications of quantum topology to classical topology"  
Philadelphia ACT Seminar "3-dimensional surgery and 4-dimensional handlebodies" (Jan-Feb 2009, two  
sessions) University of Illinois (Apr 2009) "Linking"

University of Pennsylvania (Feb 1999) "Quantum cyclotomic orders of 3





## Refereeing

Grants: National Science Foundation; Israeli Science Foundation; Binational Science Foundation.

Research Papers: Annals of Mathematics; Journal of the American Mathematical Society; Journal of the European Mathematical Society; Proceedings of the National Academy of Sciences; Inventiones Mathematicae; Journal of Mathematical Physics; Mathematische Annalen; American Mathematical Society Proceedings and Transactions; Geometry & Topology; Topology; Math Proceedings of the Cambridge Philosophical Society; Pacific Journal of Math; Communications in Analysis and Geometry; American Mathematical Monthly; Mathematics Magazine; Journal of Knot Theory and its Ramifications; Georgia International Conference Proceedings.

## Research Students

Ph.D. Students	Current Position
Isaac Sundberg	2021 Max Planck Institute (Postdoctoral Fellow)
Hannah Schwartz	2019 Princeton University (Postdoctoral Research Associate)
Kathryn Bryant	2016 SeatGeek (Data Scientist)
Jennifer Hom	2011 Georgia Tech (Associate Professor)
Jonah Swann	2010 bRainmaker (Founder)
Gowri Meda	1997 Oregon Episcopal School (Teacher)





## Search Committees

Mathematics Department	2017-18, 10-11, 08-09, 04-05, 00-01 1992-93(chair), 1987-91
Physics Department	2006-07, 04-05
Bryn Mawr Computer Science Department	1992-93(chair)
Haverford Math Searches	1994-95, 1985-86
Keck Fellowship	2001-02
Noether Lectureship	1997-98(cochair)

## Other College Service

Solo and Chamber Music Recitals at Bryn Mawr (several/years)	1984-2011
Panelist and Performer in "A Conversation with Emanuel Ax"	2006
Cofounder of Chamber Music Society at Bryn Mawr	1985
Faculty Research Evening Lecture	1993
Prospectives Lecture	1990
Panelist for Gathering of High School Counselors	1987
Panelist for Alumni Gathering	1983

## Departmental Service

Chair	2011-14, 05-06, 1998-99, 93-96
Director of Graduate Studies	2017-2020, 01-02, 1999-2000, 1981-92
Colloquium Coordinator	2021-present, 2012-13, 06-07, 04-05, 00-01, 1997-98, 81-90
Putnam Club Advisor	2003-04
Computer Coordinator	2005-06, 04-05
Supervised Summer Research	
Undergraduates	2004-06, 00, 1990
Graduates	2004-present, 1998-01, 94, 91