

Tomasz S. Mrowka

Professor of Mathematics, MIT

Concise curriculum vitae - August 2026

Massachusetts Institute of Technology

Department of Mathematics, Room 2-440

Cambridge, MA 02139

Office: (617) 253-2857

mrowka@math.mit.edu

Research

Partial differential equations; differential topology of three- and four-dimensional manifolds; knot theory; and mathematical aspects of gauge theories.

Academic appointments

- Professor of Mathematics, Massachusetts Institute of Technology, 1996-present.
- Singer Professor of Mathematics, Massachusetts Institute of Technology, 2007-2017.
- Simons Professor of Mathematics, Massachusetts Institute of Technology, 2006-2007.
- Fellow, Radcliffe Institute for Advanced Study, 2012-2013.
- Member, Institute for Advanced Study, 2003-2004 academic year.
- Visiting Professor of Mathematics, Massachusetts Institute of Technology, Fall 1995.
- Clay Visiting Professor of Mathematics, Harvard University, Spring 1995.
- Professor of Mathematics, California Institute of Technology, 1994-1996.
- Associate Professor of Mathematics, California Institute of Technology, 1992-1994.
- Visiting Assistant Professor of Mathematics, California Institute of Technology, 1991-1992.
- Szegő Assistant Professor of Mathematics, Stanford University, 1989-1991.
- Research Fellow, Mathematical Sciences Research Institute, 1988-1989.

Education

- Ph.D. in Mathematics, University of California, Berkeley, 1988. Dissertation: A Local Mayer-Vietoris Principle for Yang-Mills Moduli Spaces, under the direction of Clifford H. Taubes and Robion C. Kirby.
- S.B. in Mathematics, Massachusetts Institute of Technology, 1983.

Selected honors and awards

- Leroy P. Steele Prize for Seminal Contribution to Research, American Mathematical Society, jointly with Peter B. Kronheimer, 2023.
- Simons Fellowship in Mathematics, 2017.
- Elected to the National Academy of Sciences, 2015.
- Joseph L. Doob Prize, American Mathematical Society, jointly with Peter B. Kronheimer, 2011.
- Guggenheim Fellow, 2010.
- Elected to the American Academy of Arts and Sciences, 2007.
- Oswald Veblen Prize in Geometry, American Mathematical Society, jointly with Peter B. Kronheimer, 2007.
- Sloan Research Fellow, 1993-1995.
- National Young Investigator, 1993-1998.

Selected publications

1. P. B. Kronheimer and T. S. Mrowka, *Monopoles and Three-Manifolds*, New Mathematical Monographs 10, Cambridge University Press, 2007, xii+796 pp. DOI: [10.1017/CBO9780511543111](https://doi.org/10.1017/CBO9780511543111).
2. P. B. Kronheimer and T. S. Mrowka, "Relations in singular instanton homology," *Geom. Topol.* 29 (2025), 1975-2046. DOI: [10.2140/gt.2025.29.1975](https://doi.org/10.2140/gt.2025.29.1975).
3. P. B. Kronheimer and T. S. Mrowka, "SU(3) instanton homology for webs and foams," [arXiv:2505.02755](https://arxiv.org/abs/2505.02755) [math.GT], 2025.
4. P. B. Kronheimer and T. S. Mrowka, "Tait colorings, and an instanton homology for webs and foams," *J. Eur. Math. Soc.* 21 (2019), no. 1, 55-119.
5. P. B. Kronheimer and T. S. Mrowka, "Khovanov homology is an unknot-detector," *Publ. Math. Inst. Hautes Études Sci.* 113 (2011), 97-208.
6. P. B. Kronheimer and T. S. Mrowka, "Knot homology groups from instantons," *J. Topol.* 4 (2011), no. 4, 835-918.
7. P. B. Kronheimer and T. S. Mrowka, "Knots, sutures, and excision," *J. Differential Geom.* 84 (2010), no. 2, 301-364.
8. P. B. Kronheimer, T. S. Mrowka, P. S. Ozsváth, and Z. Szabó, "Monopoles and lens space surgeries," *Ann. of Math.* (2) 165 (2007), no. 2, 457-546.
9. P. B. Kronheimer and T. S. Mrowka, "Witten's conjecture and Property P," *Geom. Topol.* 8 (2004), 295-310.
10. P. B. Kronheimer and T. S. Mrowka, "Embedded surfaces and the structure of Donaldson's polynomial invariants," *J. Differential Geom.* 41 (1995), no. 3, 573-734.
11. P. B. Kronheimer and T. S. Mrowka, "The genus of embedded surfaces in the projective plane," *Math. Res. Lett.* 1 (1994), no. 6, 797-808.

Major lectures

- Plenary speaker, jointly with Peter B. Kronheimer, International Congress of Mathematicians, Rio de Janeiro, August 2018.
- The Structure of Donaldson's Polynomial Invariants, International Congress of Mathematicians, 45-minute invited address in Geometry, Zürich, August 3-11, 1994.
- Instanton Homology for Links and Webs in 3-Manifolds, Minerva Distinguished Visitor Mini-Course, Princeton University, March 5 and 19; April 2, 9, 16, and 23; and May 7, 2025.
- Forty Years of Four-Manifolds, Myhill Lectures, University at Buffalo, April 23-25, 2024.
- Applications of Gauge Theory to the Topology of Three-Manifolds and Maybe Combinatorics, Clifford Lectures, Tulane University, January 23-26, 2019.
- Applications of Gauge Theory to 3-Dimensional Topology and Maybe to Combinatorics, Roever Lecture, Washington University in St. Louis, March 6, 2018.

Mentoring

Supervised 32 Ph.D. students and mentored 15 postdoctoral scholars.

Selected professional service

- Joint managing editor, *Journal of Symplectic Geometry and Advances in Mathematics*.
- Head, MIT Department of Mathematics, 2014-2017.
- National Science Foundation Committee of Visitors, Division of Mathematical Sciences, 1995, 1998, and 2024.