Mathematics Department
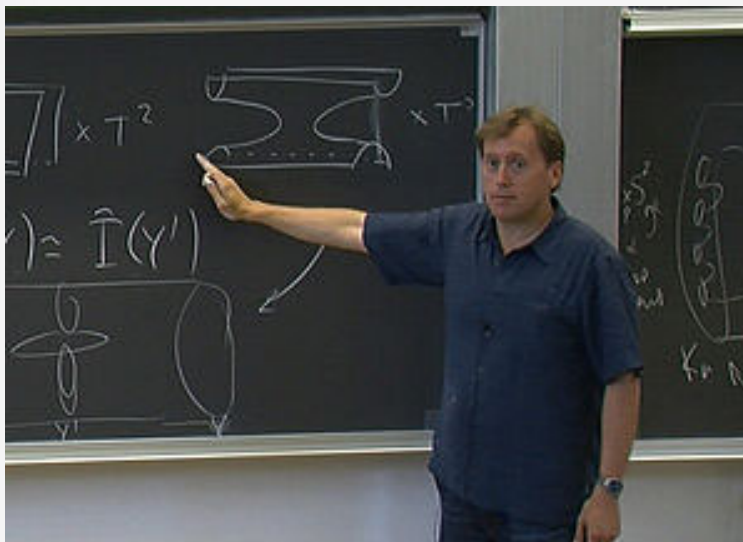# Distinguished Lecturer, Spring 2023

Tomasz Mrowka

Department of Mathematics
Massachusetts Institute of Technology

Floer Homology for three manifolds and its applications

Abstract: Floer homology theories for 3-manifolds come from many sources Instantons, Seiberg-Witten Monopoles, Heegaard Floer and Embedded Contact Floer theories. They have proven to be a powerful tools in low dimensional topology. I'll try to outline some of their applications and give some prospects for some future directions. This is meant to be a fly over without (m)any details hopefully accessible to a rather general mathematics audience.

Tuesday, January 17, 2023

Kaprielian Hall

Lecture: 2:00p.m.
KAP 414

Reception: 3:00 p.m.
KAP 410

Wine & Cheese: 4:30 p.m.
KAP 410

CAMS Director:
Susan Friedlander
susanfri@usc.edu

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Dana and David Dornsife
College of Letters, Arts and Sciences

Tomasz Mrowka A 1983 graduate of the Massachusetts Institute of Technology, he received the PhD from the University of California, Berkeley in 1988 under the direction of Clifford Taubes and Robion Kirby. He joined the MIT mathematics faculty as professor in 1996, following faculty appointments at Stanford University and at the California Institute of Technology (professor 1994–96). At MIT, he was the Simons Professor of Mathematics from 2007–2010. Upon Isadore Singer's retirement in 2010 the name of the chair became the Singer Professor of Mathematics which Mrowka held until 2017. He was named head of the Department of Mathematics in 2014 and held that position for 3 years.

A prior Sloan fellow and Young Presidential Investigator, in 1994 he was an invited speaker at the International Congress of Mathematicians (ICM) in Zurich. In 2007, he received the Oswald Veblen Prize in Geometry from the AMS jointly with Peter Kronheimer, "for their joint contributions to both three- and four-dimensional topology through the development of deep analytical techniques and applications." He was named a Guggenheim Fellow in 2010, and in 2011 he received the Doob Prize with Peter B. Kronheimer for their book Monopoles and Three-Manifolds (Cambridge University Press, 2007). In 2018 he gave a plenary lecture at the ICM in Rio de Janeiro, together with Peter Kronheimer. In 2023 he was awarded the Leroy P. Steele Prize for Seminal Contribution to Research (with Peter Kronheimer).

He became a fellow of the American Academy of Arts & Sciences in 2007, and a member of the National Academy of Sciences in 2015.