

David Treumann
Curriculum Vitae

Address

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Education

2002–2007 Princeton University, Ph.D. Thesis advisor: Robert MacPherson.
2000–2002 University of Minnesota, B.Sci. summa cum laude

Positions

Associate Professor, Boston College. 2016–present
Assistant Professor, Boston College. 2012–2016
von Neumann Fellow, IAS, 2016-2017 academic year
Member, MSRI, Fall of 2014
Boas Assistant professor, Northwestern University. 2009–2012.
Dunham Jackson Assistant professor, University of Minnesota. 2008–2009.
Postdoctoral fellow, Northwestern University. 2007–2008.

Awards and grants

NSF Grant DMS-1811971, “Applications of microlocal sheaves of spectra and K-theory.” 2018-2021
NSF Grant DMS-1510444, “Legendrian knots and Lagrangian surfaces,” 2015-2018
NSF Grant DMS-1206520, “Mirror symmetry and the microlocal theory of sheaves,” 2012–2015
Sloan Research Fellowship, 2013–2017
AMS-Simons Travel Grant 2011–2013

Students

Melissa Zhang, who I co-advise with Eli Grigsby. Ph.D. defense coming in Spring 2019.

Papers

Published or Accepted

1. with Theo Johnson-Freyd, $H^4(\mathrm{Co}_0; \mathbf{Z}) = \mathbf{Z}/24$, IMRN 2018
2. with Eric Zaslow, *Cubic planar graphs and Legendrian surface theory*, Adv. Theor. Math. Phys., to appear.
3. *Smith theory and geometric Hecke algebras*, Math. Ann. to appear.
4. with Vivek Shende and Eric Zaslow, *Legendrian knots and constructible sheaves*, Invent. Math. 2016.
5. with Akshay Venkatesh, *Functoriality, Smith theory, and the Brauer homomorphism*, Ann. of Math., 2016.
6. with Robert Lipshitz, *Noncommutative Hodge-to-de Rham spectral sequence and the Heegard Floer homology of double covers*, J. European Math. Soc., to appear.
7. *Morse theory and toric vector bundles*, Trans. AMS, to appear.
8. with Nicolò Sibilla and Eric Zaslow, *Ribbon graphs and mirror symmetry*, Selecta Math., 2014.
9. With Helge Ruddat, Nicolò Sibilla, and Eric Zaslow, *Skeleta of affine hypersurfaces*, Geometry and Topology, 2014
10. with Bohan Fang, Chiu-Chu Melissa Liu, and Eric Zaslow, *The coherent-constructible correspondence for toric Deligne-Mumford stacks*, IMRN 2012.
11. with Bohan Fang, Chiu-Chu Melissa Liu, and Eric Zaslow, *T-duality and homological mirror symmetry for toric varieties* Advances in Math, **229** 2012.
12. with Pramod Achar, *Purity and decomposition theorems for staggered sheaves*, J. Inst. Math. Jussieu, **11** 2012.
13. with Bohan Fang, Chiu-Chu Melissa Liu, and Eric Zaslow, *A categorification of Morelli's theorem*, Invent. Math. **186** 2011

14. with Bohan Fang, Chiu-Chu Melissa Liu, and Eric Zaslow, *The coherent-constructible correspondence and Fourier-Mukai transforms*, Acta Math Sinica **27** 2011
15. with Pramod Achar, *Baric structures on triangulated categories and coherent sheaves*, IMRN 2011
16. with Bohan Fang, Chiu-Chu Melissa Liu, and Eric Zaslow, *The coherent-constructible correspondence and homological mirror symmetry for toric varieties*, Geometry and Analysis Vol. 2, Adv. Lect. Math (ALM) **18**, Higher Education Press, 2010
17. *Staggered t -structures on toric varieties* J. Algebra **323** 2010
18. *Stacks similar to the stack of perverse sheaves*, Trans. Amer. Math. Soc. **362** 2010
19. *A topological approach to induction theorems in Springer theory*, Represent. Theory **13** 2009
20. *Exit paths and constructible stacks*, Compositio Math. **145** 2009

Preprints

available on arxiv.org

21. *Representations of finite groups on modules over K -theory*, 2015.
22. with Vivek Shende, Harold Williams, and Eric Zaslow, *Cluster varieties from Legendrian knots*, 2015.
23. with Vivek Shende and Harold Williams, *On the combinatorics of exact Lagrangian surfaces*, 2016.
24. with Xin Jin, *Brane structures in microlocal sheaf theory*, 2017
25. *The Alexander polynomial at prime powers*, 2017
26. with Theo Johnson-Freyd, *Third homology of some sporadic groups*, 2018
27. with Harold Williams and Eric Zaslow, *Kasteleyn operators from mirror symmetry*, 2018

Service

Workshops organized

- with Eli Grigsby and John Baldwin “Low-dimensional topology, complex and symplectic geometry,” 12th William Rowan Hamilton workshop, Trinity College, Dublin, August 2016
- with Dan Gallagher, Lenny Ng, Steven Sivek, Vivek Shende, Eric Zaslow, “Legendrian knots and constructible sheaves,” SQuaRE workshop at AIM in Palo Alto, April 2014 and February 2015

at Boston College

- Faculty liaison to Boston College Math Society, 2012-2014.
- Personnel committee (postdoc) 2012-2013, personnel committee (tenure-track) 2013-2014.
- Graduate admissions committee 2013-2014, 2015-2016, 2017-2018.
- Supervised Arnav Roy (BC'17) and his Boston College Undergraduate Research Fellowship on Smith theory and elementary number theory, summer 2014.
- Supervised Daniel Gallagher (BC'17) summer research project on Legendrian knots with binary front projections.
- Represented Boston College at “International Cooperation, Innovation and Collaboration” conference and Memorandum of Understanding signing ceremony, Tsinghua University May 2013.

at Northwestern

- Five lectures on graphs and their eigenvalues at “Discrete and continuous geometries, an undergraduate conference,” July 2010.
- with Erik Carlsson, organized Geometry and Physics Seminar for 2009-2010.

Lectures (2014-on)

- “Flat Legendrian links, homological mirror symmetry, and the Kasteleyn matrix”, Mini-workshop on Legendrian submanifolds, Montreal, November 10 2018
- “The Fargues-Fontaine curve from Floer theory on the torus”, Wall-crossing formula, open Gromov-Witten invariants and related areas, IBS-CGP, Pohang, October 31 2018
- “Arboreal subquotients of foliations,” International Conference on Geometric Representation Theory and Symplectic Varieties, June 27 2018
- “Complex K -theory of mirror pairs,” Geometry and Topology seminar, Princeton, April 2018.
- “ F -fields,” University of Michigan algebraic geometry seminar, March 2018
- “Sheaves and Lagrangians,” Yale Colloquium, February 22 2018
- “ F -fields,” UC Davis, January 10 2018
- “Lagrangian surfaces and Deligne-Lusztig varieties” Geometry and Topology seminar, MIT, September 25 2017
- “Constructible sheaves and immersed Lagrangians”, Floer homology and homotopy theory conference, July 2017
- “ F -fields,” Algebraic Analysis in honor of Masaki Kashiwara’s 70th birthday, June 2017
- “Course on microlocal sheaf theory”, three lectures, The Seventh Advanced Seminar in Symplectic Geometry and Topological Field Theory, Beijing, May 9-12 2017
- “Microlocal sheaf theory and Lagrangian handlebodies,” Enumerative geometry seminar, Columbia University April 24 2017
- “Constructible sheaves in symplectic topology” and “Constructible sheaves in mirror symmetry,” two lectures at Institute for Advanced Study, January 2017

- “Legendrians and categories,” five lectures, Institute for Advanced Study Fall 2016
- “Irregular singularities,” Gamma-integral structures seminar, Institute for Advanced Study Fall 2016
- “Invariants of Lagrangians via microlocal sheaf theory” and “Some examples in three dimensions,” two lectures at SYZ miniworkshop, Center for Mathematical Sciences, Harvard, November 30–December 1 2016.
- “The K -theoretic Brauer homomorphism,” Johns Hopkins Number theory seminar, November 29 2016
- “Betti spectral curves,” AGNES, Amherst MA, November 6 2016
- “Blocks of finite groups and their deformations over complex K -theory”, Yale colloquium, Newark, November 2 2016,
- “Blocks of finite groups and their deformations over complex K -theory”, Rutgers colloquium, Newark, September 28, 2016,
- “The Maslov cycle and the J -homomorphism,” July 2016, at Jussieu Symplectic topology, sheaves, and mirror symmetry summer school, Paris (France)
- May 2016, Georgia Topology conference
- “The K -theoretic Brauer homomorphism” Boston University number theory seminar, February 8 2016
- “The Maslov cycle and the J -homomorphism,” MIT topology seminar, November 16 2015
- “Moduli of Lagrangian surfaces,” University of Texas Geometry seminar, November 6 2015
- “Moduli of Lagrangian surfaces,” Boston University Geometry and Physics seminar, October 28 2015
- “The Maslov cycle and the J -homomorphism,” Northwestern University Geometry and Physics seminar, October 8 2015

- “Moduli of Lagrangian surfaces,” at PCMI summer session on Geometry of moduli spaces and representation theory, Park City Utah, July 3 2015
- “Legendrian knots and Lagrangian surfaces,” MIT Geometry and Topology seminar, April 13 2015
- “Functoriality, Smith theory, and the Brauer homomorphism,” UC Santa Cruz colloquium, November 25 2014
- “Lagrangian fillings of Legendrian knots,” USC Algebra seminar, November 3 2014
- “What is an L -group?” with Wee Teck Gan, MSRI, October 29 2014.
- “Stokes examples and the wild annulus,” MSRI, October 28 2014.
- “Lagrangian fillings of Legendrian knots,” Stanford Symplectic Geometry seminar, October 13 2014.
- “Legendrian knots and constructible sheaves” KSU Mirror Symmetry seminar, March 5 2014
- “Functoriality, Smith theory, and the Brauer homomorphism,” UW Madison colloquium, February 7 2014.