## Nathaniel Bottman


CONTACT INFORMATION

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PROFESSIONAL APPOINTMENTS

**Assistant Professor (postdoctoral position), University of Southern California**, Los Angeles, CA, 2019–2022.

**Member, Institute for Advanced Study**, Princeton, NJ, 2016–2019

**Postdoctoral Research Fellow, Princeton University**, Princeton, NJ, 2016–2019

**Instructor, Northeastern University**, Boston, MA, 2015–2016

INTERESTS

Symplectic geometry, with connections to combinatorics, operad theory, and algebraic geometry

GRANTS

**National Science Foundation Standard Grant** DMS-1906220, *Relating Fukaya Categories Using Combinatorics, Operads, and Nonlinear Elliptic Partial Differential Equations*, $144K, 2019–22.

EDUCATION

**Massachusetts Institute of Technology**, Cambridge, MA
Ph.D., Mathematics, September 2015, advised by Katrin Wehrheim

**University of Washington**, Seattle, WA
B.S., Mathematics, B.A., Slavic Languages and Literatures, June 2010

HONORS AND AWARDS

National Science Foundation Mathematical Sciences Postdoctoral Research Fellowship, 2016–2019
National Science Foundation Graduate Research Fellowship, 2010–2015
University of Washington Dean's Medal, 2010 (given to the top senior in the natural sciences)

PUBLICATIONS IN SYMPLECTIC GEOMETRY ("*" = UNDERGRADUATE COAUTHOR.)

**The 2-associahedra are Eulerian lattices**. Nathaniel Bottman, Dylan Mavrides*. Preprint available at https://arxiv.org/abs/1910.09672. 10pp.

**A compactification of the space of marked vertical lines in $\mathbb{C}$**. Nathaniel Bottman, Alexei Oblomkov. Preprint available at https://arxiv.org/abs/1910.02037. 37pp.

**$A_\infty$-categories and relative 2-operads**. Nathaniel Bottman, Shachar Carmeli. Submitted to *Higher Structures*; preprint available at https://arxiv.org/abs/1811.05442. 13pp.

**Explicit constructions of quilts with seam condition coming from symplectic reduction.** Nathaniel Bottman. Accepted (2019), *Kyoto Journal of Mathematics*. 9pp.

**Moduli spaces of witch curves topologically realize the 2-associahedra.** Nathaniel Bottman. Accepted (2018), *Journal of Symplectic Geometry*. 21pp.

**2-associahedra.** Nathaniel Bottman. Accepted (2018), *Algebraic & Geometric Topology*. 49pp.

**Pseudoholomorphic quilts with figure eight singularity.** Nathaniel Bottman. Accepted (2018), *Journal of Symplectic Geometry*. 33pp.

**Gromov compactness for squiggly strip shrinking in pseudoholomorphic quilts**. Nathaniel Bottman, Katrin Wehrheim. *Selecta Mathematica* (2018) 24, pp. 3381–3443.

OLDER PUBLICATIONS, IN NONLINEAR WAVES

**Elliptic solutions of the defocusing NLS equation are stable**. Nathaniel Bottman, Bernard Deconinck, Michael Nivala. *J. Phys. A* 44 (2011), no. 28, 24 pp.

**KdV cnoidal waves are spectrally stable** (with Bernard Deconinck). Nathaniel Bottman, Bernard Deconinck. *Discrete Contin. Dyn. Syst.* 25 (2009), no. 4, 1163–1180.

**Activities organized**

Co-organizing (with Sheel Ganatra) the USC Symplectic Geometry and Floer Theory Reading Group, Fall 2019.

Co-organized the IAS/Princeton Symplectic Geometry Seminar, Fall 2016–Spring 2019.

Co-organized the RTG Workshop on Polyfold Theory towards the Fukaya Category at UC Berkeley in June 2017. With Joel Fish and Katrin Wehrheim, arranged a weeklong workshop where ∼30 graduate students, postdocs, and professors learned about the new technology of polyfolds. Helped to launch a wiki compendium of polyfolds knowledge, now hosted at `http://polyfolds.org`.

Co-organized a Special Session on Moduli Spaces in Symplectic Geometry at the 2016 Joint Mathematical Meetings in Seattle, WA.

Co-organized the GPRT Seminar at Northeastern during 2015–16.

Co-organized the 2013 MIT-RTG Geometry Workshop in Big Bear Lake, CA. Arranged a weeklong workshop where 30 graduate students and postdocs lectured on mirror symmetry.

Co-organized the 2012 MIT-RTG Geometry Workshop in Watsonville, CA: a weeklong workshop where 35 graduate students and postdocs learned about polyfolds, under Helmut Hofer's supervision.

**Invited talks**

Geometry Seminar, University of Georgia, Spring 2020.

Workshop titled "Recent developments in Lagrangian Floer theory," Simons Center for Geometry and Physics, March 2020.

Joint Los Angeles Topology Seminar, UCLA, November 2019.

Algebra and Geometry Seminar, Caltech, October 2019.

Discrete Geometry and Combinatorics Seminar, Cornell University, September 2019.

Valley Geometry Seminar, University of Massachusetts, Amherst, September 2019.

Topology Seminar, University of Indiana, March 2019.

Symplectic Geometry Seminar, Stony Brook University, March 2019.

Symplectic Geometry, Gauge Theory, and Categorification Seminar, Columbia, February 2019.

Combinatorics Seminar, University of Washington, February 2019.

Topology Seminar, UC Berkeley, November 2018.

AMS Sectional Meeting, Northeastern University, April 2018

Master Lecture Series Workshop on Dusa McDuff's works, Tsinghua Sanya International Mathematics Forum, December 2017 (could not accept invitation)

Deformation Theory Seminar, University of Pennsylvania, December 2017

RTG Workshop on Polyfold Theory towards the Fukaya Category, UC Berkeley, June 2017

Mirror Symmetry Seminar, Kansas State University, March 2017

Members Seminar, Institute for Advanced Study, December 2016

Deformation Theory Seminar, University of Pennsylvania, February 2016

Quantum Fields and String Seminar, Perimeter Institute, Spring 2016

Jonathan Weitsman's Seminar, Northeastern University, December 2015

Mathematics Colloquium, University of Massachusetts, Boston, November 2015

Summer School on Moduli Problems in Symplectic Geometry, IHES, July 2015

Columbia Symplectic Geometry, Gauge Theory, and Categorification Seminar, April 2015

Rutgers Geometry, Symmetry, and Physics Seminar, March 2015

AMS Sectional Meeting, Michigan State University, March 2015
Northeastern University Analysis and Geometry Seminar, January 2015
Harvard Gauge Theory Seminar, October 2014
S. T. Yau's Seminar, Harvard University, October 2014
Workshop on Moduli Spaces of Pseudo-holomorphic Curves II, Simons Center, June 2014
Northern California Symplectic Geometry Seminar, Stanford University, March 2014
University of Texas Geometry Seminar, February 2014

TEACHING

Instructor, Math 226g (multivariable calculus), USC, Fall 2019
Instructor, Math 5122 (graduate course on manifolds), Northeastern University, Spring 2016
Instructor, Math 2321 (multivariable calculus for engineers), Northeastern University, Fall 2015
Recitation instructor, 18.01A/02A (single- and multivariable calculus), MIT, Fall 2013