Sushmita Venugopalan

Reader
The Institute of Mathematical Sciences,
CIT Campus, Taramani,
Chennai 600 113, India.

Phone: (91) (44) 2254 3323
Email: sushmita@imsc.res.in
Homepage http://www.imsc.res.in/~sushmita

Research

I am interested in Symplectic Geometry. I am currently working on Lagrangian Floer theory. I have also worked on strong symplectic foliations, and the symplectic vortex equations.

Education

B.Tech. Computer Science and Engineering, Indian Institute of Technology Delhi, May 2006.

Ph.D. Mathematics, Rutgers University 2012 (supervised by Prof. Chris Woodward).

Employment

Reader (equivalent of Assistant Professor with tenure), The Institute of Mathematical Sciences (2020-present).

Fellow (equivalent of Assistant Professor without tenure), The Institute of Mathematical Sciences (2016-2020).

Post-doctoral Fellow, Chennai Mathematical Institute (January 2015-April 2016).

Post-doctoral Fellow, Tata Institute of Fundamental Research (September 2012-August 2014).

Awards

3-year research grant from Science and Energy Research Board under Matrics Scheme, 2018-21.

Papers

1. S. Venugopalan, C. Woodward, G. Xu. Fukaya Categories of blow-ups, arXiv:2006.12264.
2. S. Venugopalan, C. Woodward. Tropical Fukaya algebras, arXiv:2004.14314.
3. S. Venugopalan. Novikov's theorem in higher dimensions? arXiv:1907.05876.
4. F. Presas, S. Venugopalan. Symplectic foliated fillings of sphere cotangent bundles, arXiv:1809.10363.
5. S. Venugopalan, G. Xu. Local model for the moduli space of affine vortices, *International Journal of Mathematics* Vol. 29 (2018), No. 03.
6. S. Venugopalan. Vortices on surfaces with cylindrical ends, *Journal of Geometry and Physics* 98 (2015), 575-606.

7. S. Venugopalan, C. Woodward. Classification of affine vortices, *Duke Mathematical Journal* 165 (2016), no. 9, 1695 - 1751.
8. S. Venugopalan. Yang-Mills heat flow on gauged-holomorphic maps, *J. Symplectic Geom.* 14 (2016), no. 3, 903-981.
9. A. Tripathi, S. Venugopalan, D. B. West. A short constructive proof of the Erdős-Gallai characterization of graphic lists, *Discrete Math.* 310 (2010), no. 4, 843 - 844.

Invited Talks

Research talks

Recent developments in Lagrangian Floer theory, Simons Center for Geometry and Physics, March 2022, *Counting curves tropically*.

Western Hemisphere Virtual Symplectic Seminar, June 2020, *Tropical Fukaya algebras*.

Geometry Seminar, Indian Institute of Science Bengaluru, September 2019, *Tropical curve counting*.

Seminar, Tata Institute of Fundamental Research Mumbai, January 2019, *Strong symplectic foliations*.

Conference on Analytic and Algebraic Geometry, International Center for Theoretical Sciences Bengaluru, March 2018, *In search of Lagrangians with non-trivial Floer cohomology*.

Workshop on J-Holomorphic Curves and Gromov-Witten Invariants, International Center for Theoretical Sciences Bengaluru, January 2018, *Introduction to Lagrangian Floer theory*.

Workshop on topological aspects of symplectic foliations, Universit'e de Lyon 1, September 2017, *Foliated symplectic fillings*.

School and workshop on Geometry and Physics of Moduli Spaces, Indian Institute of Science Bengaluru, March 2017, *Non-displaceable Lagrangians in the moduli space of curves*.

Workshop under Indo-European collaboration project on Moduli Spaces, ICMAT Madrid, September 2016, *Hitchin-Kobayashi correspondence for vortices on non-compact Riemann surfaces.*

Workshop on New Perspectives on Moduli Spaces in Gauge Theory, Institute for Mathematical Sciences, National University of Singapore, August 2016, *Non-displaceable Lagrangians in the moduli space of curves*.

Conference commemorating fifty years of the Narasimhan-Seshadri theorem, Chennai Mathematical Institute, October 2015, *Hitchin-Kobayashi correspondence for vortices on non-compact Riemann surfaces.*

Workshop on aspects of Higgs Bundles, Institute for Mathematical Sciences, National University of Singapore, July 2014, *Vortices on non-compact surfaces*.

Workshop on Equivariant Gromov-Witten theory and Applications, Simons Center for Geometry and Physics, May 2014, *A symplectic analog for quasimaps*.

Workshop on Geometry of the vortex equations, HIM, Bonn, November 2012, *Classification of affine vortices*.

TIFR colloquium, October 2012, *Moment map, Yang-Mills functional and vortices*.

AMS sectional meeting, Cornell, Ithaca, September 2011, *Yang Mills heat flow on gauged holomorphic maps*.

Pedagogical mini courses

Floer homology, ATM workshop on symplectic and contact geometry, IISER Bhopal, December 2018.

Yang-Mills theory, NCM Differential geometry workshop for graduate students, IISER Pune, July 2017.

Complex analysis, Teachers Enrichment Workshop, IMSc, November 2016.

Introduction to Gromov-Witten theory, Workshop on Symplectic and Contact Geometry, Harish Chandra Research Institute, Allahabad, December 2014.

Introduction to Contact Geometry, Preparatory workshop for Eliashberg's lectures, CMI, July 2013.

Talks for college and high school students

Integrals, areas and volumes Enriching Mathematics education, October 2018, organized by IMSc in P.S.Senior Secondary School, Mylapore, Chennai.

Riemann sphere and Möbius transformations, Facets, July 2018, IMSc.

Surface area of sphere: a two thousand year old proof, International Day of Women and Girls in Science, February 2017, IMSc.

How to Stably Spin a Cuboid, Facets, July 2016, IMSc.

Teaching

IMSc

Topology 1, Fall 2022.

Symplectic Geometry, Fall 2021(online), Spring 2017.

Functional Analysis, Spring 2020.

Floer theory, Spring 2019.

Topology 2, Spring 2018.

Chennai Mathematical Institute

Differential Equations , Spring 2016.

Differential Geometry, Spring 2015.

Rutgers University

Calculus 2, Spring 2012, Spring 2011, Rutgers.

Teaching assistant for various Calculus courses in Rutgers, 2007-2010.

Conference and workshop organizing

Co-organizer : (upcoming) Workshop and conference on Vortex Moduli, International Center for Theoretical Sciences, Bengaluru, 6-17 February 2023.

Co-organizer : Novel vistas in vortices, Simons Center for Geometry and Physics, Stony Brook, USA, 11-15 November 2019.

Organizer : Facets, 2017, 2018, 2019, 2020 (online), 2022. This is an annual mathematics outreach event for college students organized in IMSc.

Mentorship

Masters thesis supervisor for Paramjit Singh in 2018-19. Thesis topic : J-holomorphic curves in symplectic manifolds.

Masters thesis supervisor for Sambit Senapati in 2018-19. Thesis topic : Polygon spaces.