Christopher Scaduto – Curriculum Vitae

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Research Interests

Mathematical gauge theory and its applications to the topology of manifolds. Particular interests include Floer homology and its applications to 3-manifolds, 4-manifolds and knots; Yang-Mills and Seiberg-Witten theory; Khovanov homology; gauge theory in higher dimensions; topology of special holonomy geometry.

Education

2010-2015   PhD in Mathematics, University of California, Los Angeles
Thesis: *Instantons and odd Khovanov homology*
Advisor: Ciprian Manolescu

2006-2009   BSc in Applied Mathematics, Columbia University
Magna cum laude

Employment History

2019-Now   Department of Mathematics, University of Miami
Assistant Professor

2016-2019   Simons Center for Geometry and Physics at Stony Brook University
Joint Assistant Professor and NSF Postdoctoral Fellow

Sponsoring Scientist: Simon Donaldson

2015-2016   Department of Mathematics, Brandeis University
NSF Postdoctoral Fellow

Sponsoring Scientist: Daniel Ruberman

Awards

- NSF FRG: Collaborative Research in Gauge Theory, 2020

- NSF Mathematical Sciences Postdoctoral Fellowship, 2015

- Heaviside Wealth Management Award, 2015

- Pacific Journal of Mathematics Dissertation Prize, 2015

- Stephen J. Girsky Fellowship Award at UCLA, 2014

Publications and Preprints

1. *Chern-Simons functional, singular instantons, and the four-dimensional clasp number* (with Aliakbar Daemi), preprint (2020), arXiv:2007.13160

2. *Associative submanifolds and gradient cycles* (with Simon Donaldson), preprint (2020), arXiv:2004.07314, submitted

3. *Framed instanton homology of surgeries on L-space knots* (with Tye Lidman and Juanita Pinzon-Caicedo), preprint (2020), arXiv:2003.03329, submitted

4. *Equivariant aspects of singular instanton Floer homology* (with Aliakbar Daemi), preprint (2019), arXiv:1912.08982, submitted

5. *Computing ν-invariants of Joyce's compact G_2-manifolds*, preprint (2020), arXiv:2008.07239

6. *Niemeier lattices, smooth 4-manifolds and instantons*, preprint (2018), arXiv:1808.10321. To be published in Math. Ann.

7. *On definite lattices bounded by integer surgeries along knots with slice genus at most 2* (with Marco Golla), Trans. Amer. Math. Soc. 372 (2019), no. 11, 7805–7829.

8. *On definite lattices bounded by a homology 3-sphere and Yang-Mills instanton Floer theory*, preprint (2018), arXiv:1805.07875. To be published in Geom. Topol.

9. *An odd Khovanov homotopy type* (with Sucharit Sarkar and Matthew Stoffregen), Adv. Math. 367 (2020), 107112.

10. *Newstead's Mayer-Vietoris argument in characteristic 2* (with Matthew Stoffregen), Internat. J. Math. 30 (2019), no. 12, 1950065, 18 pp.

11. *The cohomology of rank two stable bundle moduli: mod two nilpotency and skew Schur polynomials* (with Matthew Stoffregen), Canad. J. Math. 71 (2019), no. 3, 683–715.

12. *Nilpotency in instanton homology, and the framed instanton homology of a surface times a circle* (with William Chen), Adv. Math. 336 (2018), 377–408.

13. *Two-fold quasi-alternating links, Khovanov homology and instanton homology* (with Matthew Stoffregen), Quantum Topol. 9 (2018), no. 1, 167–205.

14. *Klein-four connections and the Casson invariant for nontrivial admissible U(2) bundles* (with Matthew Stoffregen), Algebr. Geom. Topol. 17 (2017), no. 5, 2841–2861.

15. *Instantons and odd Khovanov homology*, J. Topol. 8 (2015), no. 3, 744–810.

Invited Conference Talks

- Nearly Carbon Neutral Geometric Topology Conference: June 1-14, 2020 (2 videos available online)

- AMS Special Session *Geometry of Gauge Theoretic Moduli Spaces*, UF Gainesville, 11/2/2019

- Gauge Theory and Applications, Univ. of Regensburg, 7/25/2018

- Gauge Theory in Fukuoka, Japan, 2/19/2018

- Gauge Theory and Low-dimensional Topology, Simons Center, 4/28/2017

- AMS Special Session *Floer Theoretic Invariants of 3-manifolds and Knots*, Univ. of Denver, 10/9/2016

- AMS Special Session *Floer Homology, Gauge Theory, and Symplectic Geometry*, MSU, 3/14/2015

- AMS Special Session *Algebraic Structures Motivated by Knot Theory*, UNC Greensboro, 11/8/2014

- AMS Special Session *Interaction between knots and manifolds*, SFSU, 10/25/2014

- AMS Special Session *Invariants in Low-Dimensional Topology*, UMBC, 3/30/2014

Recent Invited Seminar Talks

- Stanford Topology Seminar (remote), 5/19/2020

- North Carolina State Triangle Topology Seminar, 4/10/2019

- Harvard Gauge-Topology-Symplectic seminar, 3/29/2019

- McMaster Geometry and Topology Seminar, 3/7/2019

- UT Austin Topology Seminar, 11/5/2018

- Boston College Geometry/Topology Seminar, 10/25/2018

- Rutgers Geometric Analysis Seminar, 10/2/2018

- MIT Geometry and Topology Seminar, 3/5/2018

Teaching at the University of Miami

- MTH 782: Topics in Topology, Fall 2020
  - ⌂ https://www.math.miami.edu/ cscaduto/teaching/782-fall-2020/index.html

- MTH 211: Calculus III, Spring 2020
  - ⌂ http://www.math.miami.edu/ cscaduto/teaching/211-spring-2020/index.html

- MTH 311: Introduction to ODE, Fall 2019 (two sections)
  - ⌂ http://www.math.miami.edu/ cscaduto/teaching/311-fall-2019/index.html

Teaching at Stony Brook University

- MAT 123: Precalculus, Spring 2018
  - ⌂ www.ic.sunysb.edu/Faculty/cscaduto/teaching/mat123/index.html

- MAT 118: Mathematical Thinking, Spring 2017
  - ⌂ www.ic.sunysb.edu/Faculty/cscaduto/teaching/mat118/index.html

Miscellaneous

- Co-organizer of the University of Miami Geometry and Topology Seminar

- Co-organizer of AMS special session at the the University of Wisconsin-Madison, Fall 2019

- Referee for the publications: *Algebraic & Geometric Topology*, *Duke Mathematical Journal*, *Geometry & Topology*, *Indiana University Mathematics Journal*, *International Mathematics Research Notices*, *Journal of Topology*, *Mathematical Research Letters*, *Quantum Topology*

- Co-organizer of the *Topology and Symplectic Geometry / Math of Gauge Fields seminar* at the Simons Center and Stony Brook University, 2016-2018

References

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Tomasz Mrowka
Massachusetts Institute of Technology
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Daniel Ruberman
Brandeis University
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