Morgan Weiler: Curriculum Vitae

Contact Information

email: morgan.weiler@cornell.edu
website: https://e.math.cornell.edu/people/Morgan_Weiler/

address:
310 Malott Hall
Cornell University
Ithaca, NY 14853 USA
(607) 255-4013

Employment

Fall 2021-current	NSF Postdoctoral Fellow, Cornell University
Fall 2019-Spring 2021	RTG Lovett Instructor, Mathematics Department, Rice University

Education

May 2019	Ph.D. in Mathematics, University of California, Berkeley thesis advisor: Michael Hutchings
May 2013	B.A. in Mathematics, University of California, Berkeley

Awards and Honors

2021-2024	NSF Mathematical Sciences Postdoctoral Research Fellowship
January 2020	AWM-NSF Travel Grant
Fall 2018, 2017, and 2016	UC Berkeley RTG in Geometry and Topology Fellowship
Fall 2015-Spring 2016	Berkeley Connect Fellowship

List of Publications

Research areas: low-dimensional symplectic and contact geometry, dynamics, Floer homology. MSC 37J05, 53D35, 53D40.

Preprints:

1. Jo Nelson and Morgan Weiler, "Torus knotted Reeb dynamics and the Calabi invariant," arXiv:2310.18307.

2. Nicki Magill, Ana Rita Pires, and Morgan Weiler, "A classification of infinite staircases for Hirzebruch surfaces," submitted, arXiv:2308.08065.

Published or accepted:

1. Jo Nelson and Morgan Weiler, "Torus knot filtered embedded contact homology of the tight contact 3-sphere," to appear in the *Journal of Topology*, arXiv:2306.02125.

2. Caden Farley, Tara S. Holm, Nicki Magill, Jemma Schroder, Morgan Weiler, Zichen Wang, and Elizaveta Zabelina, "Four-periodic infinite staircases for four-dimensional polydisks," to appear in *Involve*, arXiv:2210.15069.

3. Nicki Magill, Dusa McDuff, and Morgan Weiler, "Staircase patterns in Hirzebruch surfaces," to appear in *Commentarii Mathematici Helvetici*, arXiv:2203.06453.

4. Jo Nelson and Morgan Weiler, "Embedded contact homology of prequantization bundles," to appear in the *Journal of Symplectic Geometry.* arXiv:2007.13883.

5. Maria Bertozzi, Tara S. Holm, Emily Maw, Dusa McDuff, Grace T. Mwakyoma, Ana Rita Pires, and Morgan Weiler, "Infinite staircases for Hirzebruch surfaces." *Research Directions in Symplectic and Contact Geometry and Topology*, ed. Bahar Acu et. al., Springer AWMS Vol. 27, pp. 47-157 (2021). arXiv:2010.08567.

6. Leo Digiosia, Jo Nelson, Haoming Ning, Morgan Weiler, and Yirong Yang, "Symplectic embeddings of four-dimensional polydisks into half integer ellipsoids," *Journal of Fixed Point Theory and Applications* 24(4):Paper No. 69, 38 (2022). arXiv:2010.06687.

7. Morgan Weiler, "Mean action of periodic orbits of area-preserving annulus diffeomorphisms," *Journal of Topology and Analysis*, Vol. 13, No. 4, pp. 1013-1074 (2021). `https://doi.org/10.1142/S1793525320500363`, arXiv:1810.05091. [Corrigendum under review, draft version available at `https://e.math.cornell.edu/people/Morgan_Weiler/MAA_corrigendum_Feb_27_23.pdf`.]

8. Sam Hopkins and Morgan Weiler, "Pattern avoidance in permutations on the Boolean lattice," *Order* Vol. 33, No. 2, pp. 299-310 (2016).

In Media

- Sloman, Leila. "Mathematicians Discover the Fibonacci Numbers Hiding in Strange Spaces." *Quanta*, October 17, 2022. `https://www.quantamagazine.org/mathematicians-surprised-by-hidden-fibonacci-numbers-20221017/`.

Invited Conference Talks

1. *May 3-5, 2024* Cornell Topology Festival, Ithaca, NY.

2. *January 5, 2024* AMS-AWM Special Session for Women and Gender Minorities in Symplectic and Contact Geometry and Topology, Joint Mathematics Meetings, San Francisco, CA.

3. *April 15-16, 2023* Special Session on Quantitative Aspects of Symplectic Topology, 2023 AMS Spring Central Sectional, Cincinnati, OH. "Computing ECH capacities and Infinite Staircases of Symplectic Embeddings."

4. *April 10-14, 2023* Interactions between Symplectic and Holomorphic Convexity in 4 Dimensions, BIRS, Banff, Alberta. "ECH spectral invariants for toric contact forms."

5. *September 26-30, 2022* Perspectives in equivariant topology, Cologne, Germany. "ECH cobordism maps and 4D toric symplectic embeddings."

6. *July 4-July 8, 2022* Convexity in contact and symplectic topology, conference in honor of Emmanuel Giroux, Paris, France. "ECH capacities and fractals of infinite staircases of 4D symplectic embeddings."

7. *April 25-29, 2022* Braids in Low-Dimensional Topology, ICERM, Providence, RI. "Computations of ECH capacities and infinite staircases of 4D symplectic embeddings."

8. *April 8-9, 2022* AMS-AWM Special Session: Women and Gender Minorities in Symplectic and Contact Geometry III, Joint Mathematics Meetings, virtual. "Fractals, ECH capacities, and symplectic embeddings of four-dimensional ellipsoids into Hirzebruch surfaces."

9. *November 20-21, 2021* Special Session on Low Dimensional Symplectic and Contact Topology, Their Invariants and Interactions, Fall Southeastern Sectional Meeting of the AMS, virtual. "Fractals, ECH capacities, and symplectic embeddings of four-dimensional ellipsoids into Hirzebruch surfaces."

10. ~~*June 22-26, 2020* Holomorphic curves and low-dimensional topology, Dubrovnik, Croatia.~~ *(cancelled due to COVID-19)*

11. ~~*April 6-9, 2020* Workshop on Classical and Quantum Aspects of Symplectic Geometry, Nantes, France.~~ *(cancelled due to COVID-19)*

12. *January 15, 2020* AMS-AWM Special Session on Women in Topology, Joint Mathematics Meetings, Denver, CO. "The embedded contact homology of Seifert fiber spaces."

13. *January 12, 2018* AMS-AWM Special Session: Women in Symplectic and Contact Geometry and Topology, Joint Mathematics Meetings, San Diego, CA. "Mean action of periodic orbits of area-preserving annulus symplectomorphisms."

Invited Seminar Talks

1. *April 24, 2024* Louisiana State University Geometry and Topology Seminar.

2. *April 12, 2024* University of Rochester Geometry Seminar.

3. *October 16, 2023* Georgia Tech and University of Georgia Joint Topology Seminar.

4. *February 3, 2023* University at Buffalo Geometry and Topology Seminar.

5. *November 5, 2022* GATSBY Seminar at Brown.

6. *October 27, 2022* MIT Symplectic Seminar.

7. *October 12, 2022* Edinburgh Algebraic and Symplectic Geometry Seminar.

8. *March 28, 2022* University of Maryland, College Park Geometry-Topology Seminar.

9. *October 20, 2021* Australian Geometric Topology Webinar, Zoom.

10. *October 5, 2021* Cornell University Topology and Geometric Group Theory seminar.

11. *July 13, 2021* Institut Henri Poincaré Symplectic trimester seminar, Zoom.

12. *April 26, 2021* University of Oklahoma Analysis seminar, Zoom.

13. *November 17, 2020* Cornell Topology and Geometric Group Theory seminar, Zoom.

14. *September 21, 2020* Georgia Tech Geometry Topology seminar, Zoom.

15. *June 5, 2020* Symplectic Zoominar (CRM-Montreal, Princeton/IAS, Tel Aviv, and Paris), Zoom.

16. *May 1, 2020* Western Hemisphere Virtual Symplectic seminar, Zoom, with Jo Nelson.

17. *April 27, 2020* Joint Los Angeles topology seminar, Zoom.

18. *March 9, 2020* Rice Topology Seminar.

19. *November 7, 2019* Stony Brook University Symplectic Geometry Seminar.

20. *October 18, 2019* Rio de Janiero Symplectic Seminar.

21. *April 17, 2019* UC Berkeley Topology Seminar.

22. *April 15, 2019* Stanford University Symplectic Geometry Seminar.

23. *February 5, 2019* UC Davis Geometry/Topology Seminar.

24. *December 3, 2018* Princeton University/Institute for Advanced Study Symplectic Geometry Seminar.

25. *October 25, 2018* University of California, Santa Cruz Geometry & Analysis Seminar.

26. *September 10, 2018* Rice Topology Seminar.

Other Research Talks

1. *October 26, 2020* Rice Undergraduate Mathematics Colloquium and Topology Seminar, report on products of the Summer 2020 SIREN

2. *November 7 and 14, 2018* UC Berkeley Contact Geometry Seminar

3. *January and July 2013* REU research talks at the Joint Mathematics Meetings and Permutation Patterns 2013

Service and Outreach

Refereed five papers since graduation.

Reviewer for the Mathematical Reviews Database of the AMS (MathSciNet).

Served on diversity, Math Club, and K-12 outreach committees.

Mentoring:

- *Summer 2022* Lead organizer for Cornell University's SPUR (Summer Program for Undergraduate Research) program on symplectic embeddings of toric domains and their embedding capacity functions. `https://math.cornell.edu/undergraduate-research`

- *June 2022* Mentor for Kylerec "Quantitative Symplectic Geometry" graduate student workshop. `https://kylerec.wordpress.com/`

- *Summer 2020* Mentor for Rice University Professor Jo Nelson's remote Summer Integrated Research Experience Network (SIREN) on symplectic embeddings of polydisks, resulting in the paper by Digiosia et. al.

Outreach:

- *Fall 2021-current* Postdoc co-organizer, Cornell Math Explorer's Club. `https://math.cornell.edu/mec`

- *Spring 2023 and 2024* Volunteer, Expanding Your Horizons `https://www.eyh.cornell.edu/`

- *March 26, 2024* Cornell AWM Intro to Research Seminar.

- *February 10, 2021* Lanier Middle School Math Club, Zoom. "Continued Fractions and Square Packings."

- *YouTube channel* `https://www.youtube.com/channel/UCblEQOgDtE7JPS2fNxJlnkA`

Organizing:

- *May 2023 and 2024* Co-organizer, Cornell Topology Festival. `https://e.math.cornell.edu/sites/topology/2023/index_2023.php`
- *Spring and Fall 2023* Co-organizer, Cornell Topology Seminar.
- *Fall 2020-Spring 2021* Faculty co-organizer, AWM mentorship program for freshmen, Rice University.
- *Fall 2019-Spring 2020* Faculty organizer, Horizons Colloquium Series at Rice University. `https://sites.google.com/view/anmiller/horizons`
- *January 2020* Co-organizer, special session "AMS-AWM Special Session on Women in Symplectic and Contact Geometry," Joint Mathematics Meetings, Denver, CO.
- *April 2019* Co-organizer, special session "New Advances in Symplectic and Contact Topology," AWM Research Symposium, Rice University, Houston TX.
- *January 2016* Co-organizer, Kylerec graduate student workshop in symplectic geometry, New Orleans, LA. `http://math.mit.edu/~kyler/workshop/schedule.html`

Teaching

Individual Advising:

At Cornell University

Spring 2024	Felix Roz, undergraduate reading course on Khovanov homology

Classes:

At Cornell University

Spring 2024	Math 6630, Symplectic Geometry (graduate)
Fall 2023	Math 2220, Multivariable Calculus
Fall 2023	Math 7510, Berstein Graduate Seminar in Topology: 4-manifolds, co-lead
Spring 2022	Math 4540, Differential Geometry (advanced undergraduate)
Fall 2021	Math 1110, Calculus I

At Rice University

Spring 2021	Math 238, Rice Connect (elective)
Spring 2021	Math 212, Multivariable Calculus
Fall 2020	Math 370, Calculus on Manifolds (advanced undergraduate)
Spring 2020	Math 501, Topics in Differential Geometry (graduate Riemannian geometry)
Fall 2019	Math 102, Calculus II

At UC Berkeley

Spring 2018	Math 191, experimental courses in mathematics, "Introduction to mathematical research via knot theory" (elective)
Fall 2015-Spring 2016	Graduate student mentor for Berkeley Connect

As a graduate student instructor (teaching assistant) at UC Berkeley

Spring 2019	Math 110, Linear Algebra
Spring 2017	Math 55, Discrete Mathematics
Summer 2016	Math W53, Multivariable Calculus (online)
Spring 2015	Math 54, Linear Algebra and Differential Equations
Fall 2014	Math 53, Multivariable Calculus
Spring 2014	Math 53, Multivariable Calculus
Fall 2013	Math 16A, Analytic Geometry and Calculus