Oliver Edtmair

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Research Interests

Symplectic geometry, Dynamics

Employment

ETH Zurich

- Junior Fellow at the Institute for Theoretical Studies (2024 -)

Education

University of California, Berkeley

- PhD, Mathematics, (2024). Advisor: Michael Hutchings

ETH Zurich

- MSc, Mathematics, (2019). Advisor: Will Merry
- BSc, Mathematics, (2018). Advisor: Dietmar Salamon

Publications and Preprints

11. Smooth perfectness of Hamiltonian diffeomorphism groups. (arXiv).
10. Packing stability and the subleading asymptotics of symplectic Weyl laws. (arXiv).
9. A universal extension of helicity to topological flows. (joint with S. Seyfaddini). (arXiv).
8. On closed characteristics of minimal action on a convex three-sphere. (joint with A. Abbondandolo, J. Kang). Submitted. (arXiv)
7. Symplectic capacities of domains close to the ball and Banach-Mazur geodesics in the space of contact forms. (joint with A. Abbondandolo, G. Benedetti). *Duke Mathematical Journal* **174**, 1567-1646 (2025). (journal, arXiv)
6. Legendrian embedded contact homology. (joint with J. Chaidez, L. Wang, Y. Yao, Z. Zhao). Submitted. (arXiv)
5. An elementary alternative to PFH spectral invariants. *Journal of Symplectic Geometry* **23**, 511-574 (2025). (journal, arXiv)
4. Disk-like surfaces of section and symplectic capacities. *Geometric and Functional Analysis* **34**, 1399-1459 (2024). (journal, arXiv)
3. The Ruelle invariant and convexity in higher dimensions. (joint with J. Chaidez). *Journal of the European Mathematical Society* (2025), published online first. (journal, arXiv)

2. PFH spectral invariants and C^∞ closing lemmas. (joint with M. Hutchings). Submitted. (arXiv)

1. 3D convex contact forms and the Ruelle invariant. (joint with J. Chaidez). *Inventiones mathematicae* **229**, 243-301 (2022). (journal, arXiv)

Invited Talks

38. August 2025, International Conference on Symplectic Dynamics, Shenzhen International Center for Mathematics (China)
On the topological invariance of helicity.

37. July 2025, Workshop "Billiards and quantitative symplectic geometry", Heidelberg (Germany)
On the topological invariance of helicity.

36. July 2025, Oberwolfach Workshop "Dynamische Systeme", Oberwolfach (Germany)
On the topological invariance of helicity.

35. May 2025, Georgia International Topology Conference, University of Georgia, Athens (United States)
On the topological invariance of helicity.

34. May 2025, Conference "Weyl laws across mathematics", University of Maryland, College Park (United States)
The subleading asymptotics of symplectic Weyl laws.

33. April 2025, Geometry & Dynamics seminar, Tel Aviv University (Israel)
Volume filling ellipsoids.

32. March 2025, ANR COSY rencontre, Institute Fourier, Grenoble (France)
Volume filling ellipsoids.

31. December 2024, AIMS conference, NYU Abu Dhabi (United Arab Emirates)
Symplectic Packing stability.

30. October 2024, ITS Fellows' Seminar, ETH Zurich (Switzerland)
Weyl laws in symplectic geometry.

29. September 2024, Symplectic Geometry seminar, ETH Zurich (Switzerland)
Systoles of convex energy hypersurfaces.

28. September 2024, Conference "Symplectic dynamics in Aachen", RWTH Aachen (Germany)
Systoles of convex energy hypersurfaces.

27. May 2024, MCM Symplectic Geometry Seminar, Beijing (China)
Systoles of convex energy hypersurfaces.

26. May 2024, Symplectic geometry seminar, USTC Hefei (China)
Systoles of convex energy hypersurfaces.

25. May 2024, Topology seminar, UCLA (United States)
Systoles of convex energy hypersurfaces.

24. March 2024, Symplectic geometry seminar, Columbia University (United States)
Systoles of convex energy hypersurfaces.

23. March 2024, Geometric analysis seminar, University of Maryland (United States)
Symplectic capacities of convex domains.

22. March 2024, Dynamics seminar, University of Maryland (United States)
Subleading asymptotics of symplectic Weyl laws.

21. January 2024, 3rd Global Youth Forum, IGP-USTC (China)
Clarke duality, pseudoholomorphic planes and symplectic capacities.

20. December 2023, Symplectic geometry seminar, IAS (United States)
Clarke duality and pseudoholomorphic planes.

19. December 2023, Geometry and Topology seminar, USC (United States)
Clarke duality and pseudoholomorphic planes.

18. November 2023, Symplectic Zoominar, virtual
Subleading asymptotics of symplectic Weyl laws.

17. October 2023, Geometry and Topology seminar, MIT (United States)
Subleading asymptotics of symplectic Weyl laws.

16. August 2023, Conference "Conservative dynamics and symplectic geometry", IMPA, Rio de Janeiro (Brazil)
The local strong Viterbo conjecture.

15. July 2023, Conference "From smooth to C^0 symplectic geometry", Luminy (France)
Subleading asymptotics of symplectic Weyl laws.

14. June 2023, Conference "Persistence Homology in Symplectic and Contact Topology", Albi (France)
The local strong Viterbo conjecture.

13. May 2023, Conference "Symplectic Dynamics - INdAM meeting", Rome (Italy)
Subleading asymptotics of symplectic Weyl laws.

12. April 2023, Conference "Interactions between Symplectic and Holomorphic Convexity in 4 Dimensions", Banff (Canada)
Convexity, Hamiltonian dynamics and symplectic embeddings.

11. March 2023, Northern California Symplectic Geometry Seminar, Stanford (United States)
An elementary alternative to PFH spectral invariants.

10. January 2023, Wild Dynamics seminar, Paris (France)
Quantitative C^∞ closing lemmas.

9. January 2023, Symplectix seminar, Paris (France)
Disk-like surfaces of section and symplectic embeddings.

8. December 2022, BACH seminar, Bochum (Germany)
Disk-like surfaces of section and symplectic embeddings.

7. December 2022, Symplectic geometry seminar, ETH Zurich (Switzerland)
An elementary alternative to PFH spectral invariants.

6. November 2022, Geometry and topology seminar, Caltech, Pasadena (United States)
Disk-like surfaces of section and symplectic embeddings.

5. September 2022, Conference "Low-Dimensional Topology and Homeomorphism Groups", University of Maryland, College Park (United States)
Disk-like surfaces of section and symplectic embeddings.

4. March 2022, Geometry and topology seminar, Washington University in St. Louis (United States)
Disk-like surfaces of section and symplectic embeddings.

3. November 2021, Western Hemisphere Virtual Symplectic Seminar, virtual
PFH spectral gaps and C^∞ closing lemmas.

2. July 2021, Oberseminar LMU Munich (Germany)
   Reeb dynamics on convex energy hypersurfaces.

1. January 2021, Symplectic Zoominar, virtual
   3D convex contact forms and the Ruelle invariant.

Awards

- Herb Alexander Prize for outstanding doctoral dissertation (2024)
- UC Berkeley Hallam spring fellowship (2023)
- UC Berkeley Simons spring fellowship (2022)
- Willi Studer Prize (2020). Awarded to the best student in each MSc degree programme at ETH.
- Pólya Prize (2018). Awarded to the best student in the Mathematics BSc degree programme at ETH.
- Gold medal at International Physics Olympiad (2014)

Teaching Experience

ETH Zurich

- Introduction to Morse theory, instructor, Fall 2025
- Analysis I, teaching assistant, Fall 2017
- Student supervision: Daniel Baumann (BSc thesis, ongoing)

University of California, Berkeley

- Math 110 Linear Algebra, graduate student instructor, Spring 2024
- Math 128A Numerical Analysis, graduate student instructor, Fall 2023
- Math 16A Analytic Geometry and Calculus, graduate student instructor, Fall 2022
- Math 128A Numerical Analysis, graduate student instructor, Fall 2021
- Math 128B Numerical Analysis, graduate student instructor, Spring 2021
- Math 128A Numerical Analysis, graduate student instructor, Fall 2020
- Math 128A Numerical Analysis, graduate student instructor, Spring 2020
- Math 54 Linear Algebra and Differential Equations, graduate student instructor, Fall 2019

References

- Michael Hutchings
  `hutching@math.berkeley.edu`
- Helmut Hofer
  `hofer@ias.edu`
- Claude Viterbo
  `claude.viterbo@universite-paris-saclay.fr`
- Per-Olof Persson (Teaching)
  `persson@berkeley.edu`