Mitchell A. Taylor

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Research interests

I am a graduate student at UC Berkeley working under the supervision of Daniel Tataru. Before coming to Berkeley, I studied at the University of Alberta, in Canada. My main areas of expertise include dispersive and fluid equations, functional analysis, order structures, and phase retrieval. In PDE, I have worked on nonlinear Schrödinger equations, free boundary Euler equations, and magnetohydrodynamics. In functional analysis, I began by studying the various connections between minimal topologies, unbounded topologies, uo-convergence and universal completions. More recently, I have focused on metric properties of function spaces, e.g., free Banach lattices, positive bases, and subspace structure. Finally, I have done some work in approximation theory and signal processing; more specifically, on stable phase retrieval, frame theory, and greedy algorithms.

Education

- **University of California, Berkeley** — GPA 4.0
  PhD student under Daniel Tataru — *September 2018 - Present*

- **University of Alberta** — GPA 4.0, 9 courses taken
  Master of Science, Mathematics, under Vladimir Troitsky — *September 2016 - May 2018*

- **University of Alberta** — GPA 3.97, 46 courses taken
  Bachelor of Science (Honors), Mathematical Physics — *September 2012 - May 2016*

Experience

- **Graduate Student Instructor, UC Berkeley 2021-2022**:   Math 1B (Calculus), taught both in Spring and Fall.
- **Graduate Student Instructor, UC Berkeley, 2020-2021**:   Math 1B (Calculus)
- **Graduate Student Instructor, UC Berkeley, 2019-2020**:   Math 202A/B (Graduate Analysis)
- **Graduate Student Instructor, UC Berkeley, 2018-2019**:   Grading for Math 104, GSI for Math 53 (Calculus III)
- **Teaching Assistant, University of Alberta, Fall 2016**:   Grading for Math 314 (Analysis)
- **Graduate Student Researcher**:   Spring 2021 and Fall 2022 (Berkeley), May 2017-Sep 2018 (AB)
- **NSERC Undergraduate Student Research Award (USRA)**: Summer 2015/2016, under the supervision of Xinwei Yu
- **Referee for 15+ papers**:

Selected Awards

- Outstanding GSI Award - 2021
- Math Summer Grant Award - 2021
- James H. Simons Fellowship - 2020
- Dean's Excellence Award - 2017
- Dean's Silver Medal in Science - 2016
- Queen Elizabeth II Graduate Scholarship (Master's) - 2016
- Dr. Kenneth Newbound Memorial Scholarship in Physics - 2015
- Jason Lang Scholarship - 2015
- Louise Mckinney Post-Secondary Scholarship - 2014
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- University of Alberta Academic Excellence Award - 2012
- Faculty of Science Academic Excellence Award - 2012
- Canadian Federation of University Women Scholarship - 2012
- Alexander Rutherford Scholarship - 2012

Selected talks and research visits

I have visited various universities for research visits and conferences. This includes four visits to ICMAT (Madrid) to do research with Pedro Tradacete, to attend conferences, and to give a plenary lecture. I have visited Duke University to do research with Dan Freeman, Texas A&M to visit Thomas Schlumprecht and Bill Johnson, Murcia to visit Antonio Avilés, and Chicago to visit Timur Oikhberg. I spent a semester at MSRI for the fluid dynamics program, and attended graduate student workshops in fluid dynamics at Oberwolfach and at MSRI. I have contributed to conferences at Kent State University, the University of Pretoria, the University of Alberta, MSRI, Oaxaca, ICMAT, and others. I have also given numerous talks at research seminars.

Publications

My publication list includes [1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12].

References

[1] Michael Christ, Ben Pineau, and Mitchell A. Taylor. Examples of Hölder stable phase retrival. *arXiv preprint, arXiv:2205.00187*, 2022.

[2] Daniel Freeman, Timur Oikhberg, Ben Pineau, and Mitchell A. Taylor. Stable phase retrieval in function spaces. *arXiv preprint, arXiv:2210.05114*, 2022.

[3] Daniel Freeman, Alexander M. Powell, and Mitchell A. Taylor. A Schauder basis for L_2 consisting of non-negative functions. *Math. Ann.*, 381(1-2):181–208, 2021.

[4] Mihaela Ifrim, Ben Pineau, Daniel Tataru, and Mitchell A. Taylor. No pure capillary solitary waves exist in 2D finite depth. *SIAM J. Math. Anal.*, 54(4):4452–4464, 2022.

[5] Héctor Jardón-Sánchez, Niels Jakob Laustsen, Mitchell A. Taylor, Pedro Tradacete, and Vladimir G. Troitsky. Free Banach lattices under convexity conditions. *Rev. R. Acad. Cienc. Exactas Fís. Nat. Ser. A Mat. RACSAM*, 116(1):Paper No. 15, 25, 2022.

[6] Marko Kandić and Mitchell A. Taylor. Metrizability of minimal and unbounded topologies. *J. Math. Anal. Appl.*, 466(1):144–159, 2018.

[7] Timur Oikhberg, Mitchell A. Taylor, Pedro Tradacete, and Vladimir G. Troitsky. Free Banach lattices. *arXiv preprint, arXiv:2210.00614*, 2022.

[8] Ben Pineau and Mitchell A. Taylor. Global well-posedness for the generalized derivative nonlinear Schrödinger equation. *arXiv preprint, arXiv:2112.04648*, 2021.

[9] Mitchell A. Taylor. Completeness of unbounded convergences. *Proc. Amer. Math. Soc.*, 146(8):3413–3423, 2018.

[10] Mitchell A. Taylor. Unbounded convergences in vector lattices. *MSc. thesis, University of Alberta*, 2019.

[11] Mitchell A. Taylor. Unbounded topologies and *uo*-convergence in locally solid vector lattices. *J. Math. Anal. Appl.*, 472(1):981–1000, 2019.

[12] Mitchell A. Taylor and Vladimir G. Troitsky. Bibasic sequences in Banach lattices. *J. Funct. Anal.*, 278(10):108448, 33, 2020.