Mitchell Curran

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Education

University of Sydney   10/2018–present
PhD (Mathematics)

- Supervised by A/Prof Robert Marangell, Co-supervised by Prof Yuri Latushkin
- Title of thesis: *Hamiltonian spectral theory and the Maslov index*

University of Sydney   3/2013–11/2017
BSc (Advanced Mathematics)(Honours)

- Honours Class I and the University Medal
- Honours project: *Spectral theory for the nonlinear Schrödinger equation on quantum graphs*, supervised by A/Prof Robert Marangell
- Honours courses in Asymptotic Methods and Perturbation Theory, Computational Projects in Applied Mathematics, Advanced Options Pricing, Introduction to Optimal Control, Integrable Systems, PDE's in Mathematical Biology
- Majors: Mathematics, Financial Mathematics and Statistics

Employment

University of Sydney – *Tutor*   02/2017–present
Classes taught and responsibilities involved listed below

University of Sydney – *Summer Research Intern*   12/2015–02/2016
Worked with the Bioinformatics and Applied Statistics group

Teaching

Tutoring history:

- MATH1014 Introduction to Linear Algebra   *2017*
- MATH1011 Applications of Calculus   *2017, 2022*
- MATH1013 Mathematical Modelling   *2022*
- MATH1002 Linear Algebra   *2019–2023*
- MATH1902 Linear Algebra (Advanced)   *2022*
- MATH1021 Calculus of One Variable   *2020, 2021*
- MATH1921 Calculus of One Variable (Advanced)   *2019, 2020, 2022*
- MATH1023 Multivariable Calculus and Modelling   *2019*
- MATH1923 Multivariable Calculus and Modelling (Advanced)   *2019–2022*
- MATH2921 Vector Calculus and Differential Equations (Advanced)   *2020*
- MATH3063 Nonlinear Ordinary Differential Equations with Applications   *2023*
- MATH3078 Partial Differential Equations and Waves   *2023*

Responsibilities: delivering whiteboard and online tutorials; marking quizzes, assignments and exams; responding to students' questions on online Ed forums

Selected Awards, Prizes and Grants

B.H. Neumann Prize   2022
For the best student talk at the Annual AustMS meeting

Centre for Complex Systems student travel grant   2019

For attendance at the Sydney Dynamics Group workshop 2019

- **RTP Stipend** *2018–2022*
  Funding for PhD candidature
- **Academic Merit prize** *2013–2017*
  For high performance in undergraduate courses
- **Barker prize** *2017*
  For proficiency in the Honours examinations
- **K.E. Bullen scholarship no. II in Applied Mathematics** *2017*
  For proficiency in senior mathematics and statistics courses
- **Dean's List of Excellence** *2015*
  For proficiency in senior science courses

Publications

- *Hamiltonian spectral flows, the Maslov index, and the stability of standing waves in the nonlinear Schrödinger equation*. SIAM Journal on Mathematical Analysis (SIMA). 55 (5) pp. 4998-5050. DOI: 10.1137/22M1533797. With Graham Cox, Robert Marangell and Yuri Latushkin (2023).

Presentations

Invited talks

- *Hamiltonian spectral flows, the Maslov index, and the stability of NLS standing waves* **AIMS** 2023
  Special session: Geometric methods in spectral theory of traveling waves and patterns
- *Counting eigenvalues in Hamiltonian systems via the Maslov index* **AustMS** 2022
  Special session: Dynamical systems and ergodic tsheory

Contributed talks

- *What's in the box* **ANZIAM** 2022
- *The Maslov index and the spectral stability problem for standing waves of the nonlinear Schrödinger equation* **AustMS** 2021
- *Eigenvalues for the NLS equation on a compact interval* **ANZIAM** 2020

Informal talks

- *Introduction to the Maslov index* **MaPS seminar** 2021
- Poster presentations **SDG** 2019, 2020, 2022

Workshops and conferences attended

- 13th AIMS (American Institute of Mathematical Sciences) biennial conference on Dynamical Systems, Differential Equations and Applications (**Wilmington, NC** 06/2023)

- AustMS (Australian Mathematical Society) annual meeting (virtually in **Newcastle** 12/2021, **Sydney** 12/2022)

- ANZIAM (Australia and New Zealand Industrial and Applied Mathematics) annual meeting (**Hunter Valley** 01/2020, virtually in **Perth** 02/2022)

- Sydney Dynamics Group workshop (**Jervis Bay** 11/2020, **Auckland** 11/2023)

- Lie Symmetry Techniques for Partial Differential Equations workshop (**Newcastle**, 05/2019)