

# Richard Thomas (Hughes) Derryberry

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*Current as of February 3, 2022*

**RESEARCH INTERESTS** Algebraically integrable systems, geometric representation theory, moduli spaces, quantum field theory, string theory.

**EDUCATION** Ph.D., Mathematics  
University of Texas at Austin, May 2018  
*Thesis:* Towards a Self-dual Geometric Langlands Program  
*Advisors:* David Ben-Zvi and Andrew Neitzke

B.Sc., Pure Mathematics and Mathematical Physics  
University of Melbourne, 2011

**EMPLOYMENT** Sep 2021–present  
**Perimeter Institute**, Postdoctoral Researcher  
Sep 2018–Sep 2021  
**Perimeter Institute and University of Toronto**, Coxeter Postdoctoral Fellow  
Jan 2011–Jun 2012  
**University of Melbourne**, Research Assistant

**PUBLICATIONS & PREPRINTS**

1. Lax formulation for harmonic maps to a moduli of bundles. arXiv:2106.09781
2. Stacky dualities for the moduli of Higgs bundles. *Adv. Math.*, 368 (2020)
3. Introduction to Mirror Symmetry, in Superschool on Derived Categories and D-branes. Edited by M. Ballard, C. Doran, D. Favero and E. Sharpe. *Springer Proceedings in Mathematics & Statistics*, 240 (2018)

**SELECTED TALKS**

- **Algebraic Geometry Seminar (Cornell)**, May 2021.  
*Zero-curvature formulation for novel two-dimensional field theories.*
- **Geometry, Topology and Dynamics Seminar (UIC)**, February 2020.  
*Fourier Transforms and Physical Dualities.*
- **Park City Mathematics Institute (PCMI)**, July 2019.  
*Learning seminar on “The Self Duality Equations on a Riemann Surface”.*
- **Geometry and Physics of Gauge Theories at Infinity (Saskatchewan, Canada)**, August 2018.  
*Self-dual versions of the moduli of Higgs bundles.*
- **QMAP Seminar (UC Davis)**, Fall 2017.  
*Self-dual Hitchin Systems from Theories of Class S.*
- **Superschool on derived categories and D-branes (University of Alberta)**, Summer 2016.  
*Introduction to mirror symmetry.*
- **QGM PhD Retreat (Aarhus University)**, Summer 2014.  
*Chern-Simons Theory with Finite Gauge Groups.*

## AWARDS & GRANTS

- GEAR Graduate Internship, August 2016
- GEAR Graduate Internship, July-August 2014
- AMSI Vacation Research Scholarship, 2010/2011

## TEACHING

### *Course Instructor*

Mathematics Department, University of Toronto

- MAT244 Introduction to Ordinary Differential Equations, Fall Semester 2019
- APM346 Partial Differential Equations, Winter Semester 2019 (coordinator)

### *Teaching Assistant*

Mathematics Department, University of Texas at Austin

- M382D Differential Topology (Graduate Course), Spring 2015 & 2018
- M373L Algebraic Structures II, Spring 2017
- M427J Differential Equations with Linear Algebra, Fall 2015
- M362K Probability (Flipped Classroom), Summer 2014
- M373K Algebraic Structures I, Spring 2014
- M367K Topology (Inquiry Based Learning), Spring 2014
- M408D Sequences, Series and Multivariable Calculus, Spring 2013
- M408K Differential Calculus, Fall 2012

Park City Mathematics Institute

- Advanced Topics in Mathematics and Physics of Higgs Bundles (course by Laura Schaposnik), Summer 2019

### *Preparation of lecture materials*

Mathematics Department, University of Melbourne

- MAST30029 Partial Differential Equations, Semester 2 2011

### *Mentoring (UT Austin Directed Reading Program)*

Graduate mentor for the following undergraduate students:

- Wyatt Reeves, *Commutative Algebra*, Spring 2018
- Carl Marth and Wyatt Reeves, *Index of Dirac Operators*, Fall 2017
- Wyatt Reeves, *Mathematics of Quantum Mechanics*, Spring 2017
- Sarafina Nance, *Frobenius Integrability Theorem*, Spring 2014
- Dean Menezes, *Primes in Arithmetic Progressions*, Fall 2013
- Dean Menezes, *Chebyshev's Inequalities for  $\pi(x)$* , Spring 2013

## SERVICE

- Reviewer for *Mathematical Reviews* and *zbMATH*
- Referee for *JHEP* and *SIGMA*
- Perimeter Institute Parental Leave Working Group, 2019-present
- Postdoctoral Representative at Perimeter Institute, 2018-2020
- Panelist for PCMI Careers Panel, 2019
- Learning seminars at UT Austin and University of Melbourne, Organiser/Co-organiser, 2011-2017
- UT Austin Directed Reading Program, Co-organiser, 2013-2014
- Graduate Student Geometry and Topology Conference, Co-organiser, 2014
- Sophex Seminar, Co-organiser, Spring 2013
- Melbourne University Mathematics & Statistics Society, Ed. Officer, 2010-2011