

# Tom Mainiero

*Curriculum Vitae*

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## Education

- 2015 The University of Texas at Austin: PhD in Physics. Advisor: Andrew Neitzke  
2008 Caltech: BS in Physics

## Employment

- Fall 2021- Rutgers Department of Physics, Part-time Lecturer.  
2015-2020 Rutgers New High Energy Theory Center, Department of Physics: Postdoctoral Researcher.

## Preprints/Publications

- T. Mainiero. *Homological Tools for the Quantum Mechanic*. [arXiv:1901.02011 \[hep-th\]](https://arxiv.org/abs/1901.02011).  
T. Mainiero. *Algebraicity and Asymptotics: An explosion of BPS indices from algebraic generating series*. [arXiv:1606.02693 \[hep-th\]](https://arxiv.org/abs/1606.02693).  
D. Galakhov, P. Longhi, T. Mainiero, G.W. Moore, and A. Neitzke. *Wild Wall Crossing and BPS Giants*. JHEP 1311 (2013) p. 046. [arXiv:1305.5454 \[hep-th\]](https://arxiv.org/abs/1305.5454).  
T. Mainiero and M.A. Porter. *Quantization of a Free Particle Interacting Linearly with a Harmonic Oscillator*. Chaos 17 (2007) p. 043130. [arXiv:nlin/0702025](https://arxiv.org/abs/nlin/0702025).  
T. Mainiero and M.A. Porter. *Avoided Level Crossings in the Quantization of a Mixed Regular-Chaotic System*. Chaos 17 (2007) p. 041106.

## In Progress

- R. Geiko, T. Mainiero, and G.W. Moore. *Canonical Correspondences between Matrix Product States, Completely Positive Maps, and 2D Topological Field Theories*

## Contributed Talks

- Jul. 2020 String Math 2020. *The Secret Topological Life of Mutual Information*.  
Mar. 2019 Arizona State University Differential Geometry and Control Theory Seminar. *Bill and Ted's Entropic Adventure*.  
Dec. 2018 University of Maryland Joint RIT on Quantum Information Seminar. *Some homological tools for the quantum mechanic*.  
Jan. 2018 Arizona State University Differential Geometry and Control Theory Seminar. *A Probability Talk that Spaces Out*.  
Oct. 2016 Arizona State University Differential Geometry and Control Theory Seminar. *(Dr.) Strange Duality or: how I learned to stop dozing off and learned to love (the) Boolean algebras*.  
Nov. 2015 Arizona State University Differential Geometry and Control Theory Seminar. *Morse(t) I listen to this talk?*  
Nov. 2014 Kansas State Mathematics M-Seminar. *This one weird trick has algebraic functions generating Donaldson-Thomas invariants from home!*

Sep. 2014 Texas A&M High Energy Theory Seminar. *The Joy of Watching your BPS States Grow Up*.  
Jul. 2014 West Coast Algebraic Topology Summer School on TFTs. *Quantum Chern Simons*.  
May 2014 Emphasis Year Workshop on Rep. Theory, Integrable Systems, and Quantum Fields. *Functional Equations and DT-Invariants from Spectral Networks: Revenge of the m-herds*.

### **Teaching Experience**

Fall 21 Part-time lecturer for Ph206 (Electromagnetism/Modern Physics Lab)  
Spr. 15 TA for M427L, Advanced Calculus for Applications II (Multivariable Calculus)  
Fall 13 - Spr. 13 DRP Mentor (mentoring program for undergraduates interested in mathematics)  
Fall 13 TA for M427K, Advanced Calculus for Applications I (Differential Equations)  
Fall 12 TA for M408D, Sequences, Series, and Multivariable Calculus  
Fall 10 - Spr. 12 Instructor for PS 303, Introduction to Physical Science (Mechanics)  
Fall 08 - Sum. 10 TA for PHY 303K/L, Engineering Physics I/II (Mechanics/Electromagnetism)

### **Service**

Fall 18 - Fall 19 Co-organizer for Rutgers High Energy Theory Seminar