

# Tom Mainiero

*Curriculum Vitae*

November 2023

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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 2022 - Present [St. Joseph's University, NY, Long Island](#): Dept. of Math and Computer Science: Assistant Professor  
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. *Higher Information from Families of Measures*. GSI 2023. Lecture Notes in Computer Science, vol 14071. Springer, Cham.  
T. Mainiero. *Homological Tools for the Quantum Mechanic*. [arXiv:1901.02011 \[hep-th\]](#).  
T. Mainiero. *Algebraicity and Asymptotics: An explosion of BPS indices from algebraic generating series*. [arXiv:1606.02693 \[hep-th\]](#).  
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 \[hep-th\]](#).  
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](#).  
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. *A Categorical Triality: Matrix Product Factors, Positive Maps, and von Neumann Bimodules*. **Draft Available Upon Request.**

## Contributed Talks

- Nov 2023 Caltech; Information, Geometry, and Physics Seminar. *Higher Information: The untold topological secrets of information*.  
May 2022 CUNY; Symposium on the Categorical Semantics of Entropy. [Higher Entropy \(recorded\)](#).  
Jul 2020 String Math 2020. [The Secret Topological Life of Mutual Information \(recorded\)](#) .  
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*.

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| Oct 2016  | Arizona State University; Differential Geometry and Control Theory Seminar. <i>(Dr.) Strange Duality or: how I learned to stop dozing off and learned to love (the) Boolean algebras.</i> |
| Nov. 2015 | Arizona State University; Differential Geometry and Control Theory Seminar. <i>Morse(t) I listen to this talk?</i>  |
| Nov. 2014 | Kansas State; Mathematics M-Seminar. <i>This one weird trick has algebraic functions generating Donaldson-Thomas invariants from home!</i>  |
| Sep. 2014 | Texas A&M, High Energy Theory Seminar. <a href="#">The Joy of Watching your BPS States Grow Up (recorded)</a> .   |
| Jul. 2014 | West Coast Algebraic Topology Summer School on TFTs. <i>Quantum Chern Simons.</i>   |
| May 2014  | Emphasis Year Workshop on Rep. Theory, Integrable Systems, and Quantum Fields. <i>Functional Equations and DT-Invariants from Spectral Networks: Revenge of the m-herds.</i>              |

## Teaching Experience

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|-------------------|---|
| Fall 23           | Multivariable Calculus (MA207, St. Joseph's)  |
| Fall 22 - Spr. 23 | Linear Algebra (MA356, St. Joseph's)  |
| Fall 22 - Spr. 23 | Calculus I (MA205, St. Joseph's)  |
| Fall 21           | Electromagnetism/Modern Physics Lab, Part-time lecturer (Ph206, Rutgers)                                    |
| Spr. 15           | TA: Multivariable Calculus (M427L, UT Austin)   |
| Fall 13 - Spr. 13 | Directed Reading Program Mentor (mentoring program for undergraduates interested in mathematics, UT Austin) |
| Fall 13           | TA: Differential Equations (M427K, UT Austin)   |
| Fall 12           | TA: M408D, Sequences, Series, and Multivariable Calculus (M408D, UT Austin)                                 |
| Fall 10 - Spr. 12 | Mechanics Introductory Lab, Instructor (PS303, UT Austin)   |
| Fall 08 - Sum. 10 | TA: Mechanics/Electromagnetism for Engineers (PHY 303K/L, UT Austin)  |

## Service

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