

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

- 2022 Fall - Present [St. Joseph's University, NY, Long Island](#): Dept. of Math and Computer Science: Assistant Professor
2021 Fall 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 Mechanics*. [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

- 2023 Nov Caltech; Information, Geometry, and Physics Seminar. *Higher Information: The untold topological secrets of information*.
2022 May CUNY; Symposium on the Categorical Semantics of Entropy. [Higher Entropy \(recorded\)](#).
2020 Jul String Math 2020. [The Secret Topological Life of Mutual Information \(recorded\)](#) .
2019 Mar Arizona State University, Differential Geometry and Control Theory Seminar. *Bill and Ted's Entropic Adventure*.
2018 Dec University of Maryland, Joint RIT on Quantum Information Seminar. *Some homological tools for the quantum mechanics*.
2018 Jan Arizona State University; Differential Geometry and Control Theory Seminar. *A Probability Talk that Spaces Out*.

2016 Oct	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>
2015 Nov	Arizona State University; Differential Geometry and Control Theory Seminar. <i>Morse(t) I listen to this talk?</i>
2014 Nov	Kansas State; Mathematics M-Seminar. <i>This one weird trick has algebraic functions generating Donaldson-Thomas invariants from home!</i>
2014 Sep	Texas A&M, High Energy Theory Seminar. The Joy of Watching your BPS States Grow Up (recorded) .
2014 Jul	West Coast Algebraic Topology Summer School on TFTs. <i>Quantum Chern Simons.</i>
2014 May	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

24 Spr	Real Analysis (MA307, St. Joseph's)—taught inquiry based style
24 Spr	Calculus I (MA205, St. Joseph's)
24 Spr	Multivariable Calculus (MA207, St. Joseph's)
23 Fall	Multivariable Calculus (MA207, St. Joseph's)
22 Fall–24 Spr	Linear Algebra (MA356, St. Joseph's)
22 Fall–23 Spr	Calculus I (MA205, St. Joseph's)
21 Fall	Electromagnetism/Modern Physics Lab, Part-time lecturer (Ph206, Rutgers)
15 Spr	TA: Multivariable Calculus (M427L, UT Austin)
13 Fall–13 Spr	Directed Reading Program Mentor (mentoring program for undergraduates interested in mathematics, UT Austin)
13 Fall	TA: Differential Equations (M427K, UT Austin)
12 Fall	TA: M408D, Sequences, Series, and Multivariable Calculus (M408D, UT Austin)
10 Fall–12 Spr	Mechanics Introductory Lab, Instructor (PS303, UT Austin)
08 Fall–10 Sum	TA: Mechanics/Electromagnetism for Engineers (PHY 303K/L, UT Austin)

Other Teaching

22, 23, 24 Sum	Instructor for numerous topics courses (e.g. Dynamical Systems, Number Theory, Knot Theory) during the “Week of Chaos” at Mathily-Er (an inquiry based summer program for high school students).
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Service

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