Jack T. Dinsmore

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Education

Sept 2022 – present	**Stanford University** PhD in Physics (estimated completion 2027) GPA: 4.0/4.0
Sept 2018 – May 2022	**Massachusetts Institute of Technology** BS in Physics; Minors in Astronomy and Mathematics; Concentration in Music GPA: 5.0/5.0

Awards & Honors

April 2024	• Received the NSF Graduate Research Fellowship Program Honorable Mention.
May 2022	• Received Barrett Prize for excellence in astrophysics research on recommendation from Prof. Tracy Slatyer.
May 2022	• Inducted into Phi Beta Kappa and Sigma Pi Sigma honors societies for excellence in academics with a humanities element (Phi Beta Kappa) and in physics (Sigma Pi Sigma).
May 2020	• Accepted at competitive REU program at Lehigh University.

Presentations & Press

September 2024	• Presentation to the International X-ray Polarimetry Symposium (IXPO) showing large improvements to data quality using new techniques $\sim$ *50 in attendance*
May 2024	• Presentation to the Stanford workshop Fields, Flows, and Filaments in the Magnetic ISM regarding pulsar X-ray filaments. $\sim$ *40 in attendance*
June 2023	• Presentation to Asteroids, Comets, and Meteorites conference on extracting asteroid densities from tidal torque. $\sim$ *200 in attendance*
October 2022	• Press release on extracting asteroid densities from tidal torque. *MIT News*. Featured in an *Astrobites* post.
April 2022	• Presentation to Apophis T$-$7 Years on how to map Apophis's internal structure with Earth's gravity. $\sim$ *200 in attendance*
Aug 2021	• Concluding research presentation to PRISM, an MIT undergraduate research conference, for my research on the Galactic Center Excess. $\sim$ *30 in attendance*
Aug 2020	• Research presentation to conclude my REU at Lehigh University to REU faculty, students, and members of the public. $\sim$ *25 in attendance*

Research Expertise

- **Astrophysics**: Pulsars [3,5,7,8,9], polarization [5,7,9], the interstellar medium [8,9], time-domain astrophysics [6].
- **Physics**: Statistics [3,5,9], general relativity [1], particle physics [2], electromagnetism
- **Data Science**: Designing new statistical methods [4,7,8,9], analysis of data [3,5,6,7,8,9], machine learning [2,7].
- **Planetary Science**: Asteroids [4], planetary rings, tidal interactions.
- **Computer Science**: Performance computing [2,3,4,8], machine learning [2,7].

Peer Reviewed Publications

Cited in ∼100 academic works. *h*-index of 4.

[9] **Jack T. Dinsmore** and Roger W. Romani. The Guitar Filament's Magnetic Field Revealed by Starlight Polarization . *Submmitted to the Astrophysical Journal Letters*, November 2024

[8] **Jack T. Dinsmore** and Roger W. Romani. A Catalog of Pulsar X-Ray Filaments. *The Astrophysical Journal*, 976(1):4, November 2024

[7] **Jack T. Dinsmore** and Roger W. Romani. Polarization Leakage and the IXPE Point-spread Function. *The Astrophysical Journal*, 962(2):183, February 2024

[6] Tobin M. Wainer, Gail Zasowski, Joshua Pepper, Tom Wagg, Christina L. Hedges, Vijith Jacob Poovelil, Tara Fetherolf, James R. A. Davenport, P. Marios Christodoulou, **Jack T. Dinsmore**, Avi Patel, Kameron Goold, and Benjamin J. Gibson. Catalog of Integrated-light Star Cluster Light Curves in TESS. *The Astronomical Journal*, 166(3):106, August 2023

[5] Josephine Wong, Roger W. Romani, and **Jack T. Dinsmore**. Improved Measurements of the IXPE Crab Polarization. *The Astrophysical Journal*, 953(1):28, July 2023

[4] **Jack T Dinsmore** and Julien de Wit. Constraining the Interiors of Asteroids Through Close Encounters. *Monthly Notices of the Royal Astronomical Society*, 520(3):3459–3475, 10 2022

[3] **Jack T. Dinsmore** and Tracy R. Slatyer. Luminosity Functions Consistent with a Pulsar-Dominated Galactic Center Excess. *JCAP*, 06(06):025, 2022

[2] Jeffrey Krupa, Kelvin Lin, Maria Acosta Flechas, **Jack Dinsmore**, Javier Duarte, Philip Harris, Scott Hauck, Burt Holzman, Shih-Chieh Hsu, Thomas Klijnsma, Mia Liu, Kevin Pedro, Dylan Rankin, Natchanon Suaysom, Matt Trahms, and Nhan Tran. GPU Coprocessors as a Service for Deep Learning Inference in High Energy Physics. *Machine Learning: Science and Technology*, 2(3):035005, April 2021

[1] **Jack Dinsmore**, Patrick Draper, David Kastor, Yue Qiu, and Jennie Traschen. Schottky Anomaly of deSitter Black Holes. *Class. Quant. Grav.*, 37(5):054001, 2020

In addition to these, I have submitted three scientific grant applications as the principal investigator (PI) (two successful), and made significant contributions to three others as a co-investigator.

Teaching Experience & Outreach

Fall 2024	• TA for PHYSICS 110: Advanced Mechanics
Spring 2024	• Mentor for undergraduate student research project at Stanford
Winter 2024	• TA for PHYSICS 120: Intermediate Electromagnetism at Stanford (average rating of 4.7/5 in effectiveness from student feedback)
2023–present	• Editor for the KIPAC Research Highlights program
2023–2024	• Mentor for the Stanford Future Advancers of Science and Technology (FAST) program
Spring 2023	• Lab TA for PHYSICS 43: Electromagnetism at Stanford (average rating of 4.7/5 in effectiveness from student feedback)
Winter 2022	• TA and course material designer for new MIT physics class 8.S50 on statistics
2022–present	• Volunteer for KIPAC outreach programs
Spring 2019	• Problem set grader for Physics I (8.012) under Prof. Phil Harris.
Fall 2018	• SAT Math section teacher for MIT Academic Teaching Initiative.

Additional Open Source Work

I make most of my research code publicly available online on my professional GitHub. I have also built many non-research open-source projects on my personal GitHub, including a command-line website building tool, video games, Rust "crates" (code packages), notes on quantum field theory, and a statistics blog.

References are available upon request. Updated January 31, 2025