

# JACK T. DINSMORE

PhD Candidate in Physics  
Stanford University  
Stanford, CA

jtd@stanford.edu  
<https://jack-dinsmore.github.io/>  
ORCID: 0000-0002-6401-778X

## Education

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

## Awards & Honors

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|------------|--|
| 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

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

## 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. *Submitted 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) and made significant contributions to two 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.