

ANIRUDH (ANI) PRABHU

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ACADEMIC POSITIONS

Postdoctoral Fellow (Associate Research Scholar) *Sept. 2022–*
Princeton Center for Theoretical Science (PCTS), Princeton University

EDUCATION

Ph.D. in Physics, Stanford University *Sept. 2016– Sept. 2022*
Thesis Advisor: Savvas Dimopoulos
Thesis Title: *Astrophysical Signatures of Axion-Like Particles*

B.S. in Physics, Massachusetts Institute of Technology *Sept. 2012– June 2016*
Research Advisors: David Kaiser (Thesis Advisor) & Alan Guth
Thesis Title: *Preheating in Multifield Inflation* (Barrett Astrophysics Prize, MIT)
GPA: 5.0/5.0,

PUBLICATION LIST

1. Mariia Khelashvili, Mariangela Lisanti, **Anirudh Prabhu**, & Benjamin Safdi, *Detection of Pulsar-sourced Axion Signals with Axion Dark Matter Detection Experiments I: Low-frequency Resonant Searches*, (*in preparation*).
2. Sandip Roy, Carlos Blanco, Christopher Dessert, **Anirudh Prabhu**, & Tea Temim, *Sensitivity of JWST to eV-Scale Decaying Axion Dark Matter*, [arXiv:2311.04987](https://arxiv.org/abs/2311.04987) (2023).
3. Carlos Blanco, Ian Harris, Yonatan Kahn, & **Anirudh Prabhu**, *Constraining Dark Matter-Proton Scattering from Molecular Cloud Ionization*, [arXiv:2311.00740](https://arxiv.org/abs/2311.00740) (2023).
4. Dion Noordhuis, **Anirudh Prabhu**, Christoph Weniger, & Samuel J. Witte, *Axion Clouds around Neutron Stars*, [arXiv:2307.11811](https://arxiv.org/abs/2307.11811), *in review*, (Physical Review X) (2023).
5. Jamie A. P. Law-Smith, Georges Obied, **Anirudh Prabhu**, & Cumrun Vafa, *Astrophysical Constraints on Decaying Dark Gravitons*, [arXiv:2307.11048](https://arxiv.org/abs/2307.11048) (2023).
6. **Anirudh Prabhu**, *Axion-mediated Transport of Fast Radio Bursts Originating in Inner Magnetospheres of Magnetars*, [The Astrophysical Journal Letters](https://arxiv.org/abs/2307.11048), **946** L52 (2023).
7. **Anirudh Prabhu** and Carlos Blanco, *Constraints on Dark Matter-Electron Scattering from Molecular Cloud Ionization*, [Physical Review D](https://arxiv.org/abs/2307.11048) **108**, 035035 (2023).
8. Dion Noordhuis, **Anirudh Prabhu**, Samuel J. Witte, Alexander Y. Chen, Fábio Cruz, Christoph Weniger, *Novel Constraints on Axions Produced in Pulsar Polar Cap Cascades*, [Physical Review Letters](https://arxiv.org/abs/2307.11048) **131**, 111004 (2023).

9. Robert Lasenby and **Anirudh Prabhu**, *Dark Matter-Electron Scattering in Materials: Sum Rules and Heterostructures*, [Physical Review D](#) **105**, 095009 (2022).
10. **Anirudh Prabhu**, *Axion Production in Pulsar Magnetosphere Gaps*, [Physical Review D](#) **104**, 055038 (2021).
11. **Anirudh Prabhu**, *Optical Lensing by Axion Stars: Observational Prospects with Radio Astrometry*, [arXiv:2006.10231](#), in review (Physical Review D).
12. **Anirudh Prabhu** and Nicholas Rapidis, *Resonant Conversion of Dark Matter Oscillons in Pulsar Magnetospheres*, [Journal of Cosmology and Astroparticle Physics](#) 10(2020)054.
13. Matthew P. DeCross, David I. Kaiser, **Anirudh Prabhu**, Chanda Prescod-Weinstein and Evangelos I. Sfakianakis, *Preheating after Multifield Inflation with Nonminimal Couplings. III: Dynamical Spacetime Results*, [Physical Review D](#) **97**, 023528 (2018).
14. Matthew P. DeCross, David I. Kaiser, **Anirudh Prabhu**, Chanda Prescod-Weinstein and Evangelos I. Sfakianakis, *Preheating after Multifield Inflation with Nonminimal Couplings. II: Resonance Structure*, [Physical Review D](#) **97**, 023527 (2018).
15. Matthew P. DeCross, David I. Kaiser, **Anirudh Prabhu**, Chanda Prescod-Weinstein and Evangelos I. Sfakianakis, *Preheating after Multifield Inflation with Nonminimal Couplings I: Covariant Formalism and Attractor Behavior*, [Physical Review D](#) **97**, 023527 (2018).
16. **Anirudh Prabhu** and Hari M. Srivastava, *Some Limit Formulas for the Gamma and Psi (or Digamma) Functions at Their Singularities*, [Integral Transforms and Special Functions](#), Vol. 22, No. 8, 587-592, 2011.
17. **Anirudh Prabhu**, *Lower Bounds for Odd Perfect Numbers*, [International Journal of Contemporary Mathematics](#), Vol. 2, No. 1-2, 59-68, 2011.

MEDIA COVERAGE

1. *Could Axions Help Fast Radio Bursts Escape a Magnetar's Grasp?*, [AAS Nova](#), July 5, 2023.
2. *Pulsars may make dark matter glow*, [Phys.org](#), October 6, 2023.

SELECTED HONORS

<i>Fletcher Jones Graduate Fellowship</i> , The Fletcher Jones Foundation	2016–2021
<i>NSF Graduate Research Fellowship</i> , The National Science Foundation	2016–2021
<i>Barrett Astrophysics Prize</i> , MIT Department of Physics	2016
<i>Phi Beta Kappa Society</i> , MIT Department of Physics	2016
<i>Society of Physics Students</i> , MIT Department of Physics	2016
<i>Seventh Place</i> , Intel Science Talent Search, Society for Science and the Public	2012
<i>U.S. Navy Scholarship</i>	2012
<i>Third Place, Karl Menger Award</i> , American Mathematical Society,	2012, 2011
<i>Davidson Fellows Scholarship</i> , Davidson Institute	2011

INVITED TALKS & CONFERENCES

<i>High-energy Physics Seminar</i> , California Institute of Technology	March 4, 2024
<i>ITC Luncheon Talk</i> , Harvard-Smithsonian Center for Astrophysics	November 16, 2023
<i>High Energy Theory Seminar</i> , University of Minnesota	September 8, 2023
<i>Cosmic Physics Center (CPC) Seminar</i> , Fermilab	June 5, 2023
<i>Astrophysics Coffee Talk</i> , Institute for Advanced Study	May 26, 2023
<i>LCTP Spring Symposium</i> , University of Michigan	May 2, 2023
<i>High Energy Physics Seminar</i> , University of Toronto	April 3, 2023
<i>SITP Wine and Cheese Seminar</i> , Stanford University	February 24, 2023
<i>High Energy Physics Seminar</i> , McGill University	February 13, 2023
<i>PACMAN Seminar</i> , New York University	September 30, 2022
<i>PATRAS Workshop</i> , Johannes Gutenberg University of Mainz	August 8, 2022
<i>Joint Cosmology Seminar</i> , MIT & Tufts	February 8, 2022
<i>Astrophysics Coffee Talk</i> , Institute for Advanced Study	November 29, 2021
<i>Astroparticle Theory Seminar</i> , Max Planck Institute for Physics	November 25, 2021
<i>Bahcall Lunch Talk</i> , Princeton & Institute for Advanced Study	November 23, 2021
<i>Particle Physics Seminar</i> , Perimeter Institute	November 12, 2021
<i>Cosmic Physics Center (CPC) Seminar</i> , Fermilab	October 18, 2021
<i>Elementary Particle Theory Seminar</i> , University of Maryland	September 27, 2021
<i>Theoretical Particle Physics Seminar</i> , Johns Hopkins University	September 13, 2021
<i>PANIC 2021 Conference</i> , Parallel Talk	September 9, 2021
<i>TAUP 2021 Conference</i> , Parallel Talk	August 23, 2021
<i>Particle Theory Seminar</i> , LBNL	June 7, 2021
<i>KIPAC Tea Talk</i> , Stanford University	June 4, 2021
<i>BSM Pandemic Seminar Series</i> , Double Feature Talk	October 27, 2020
<i>SITP Wine and Cheese Seminar</i> , Stanford University	February 21, 2020
<i>SITP Wine and Cheese Seminar</i> , Stanford University	April 28, 2017
<i>Harvard-MIT SPS Research Conference</i> , Invited Talk	September 26, 2015
<i>Kenyon/Dartmouth/MIT Undergrad Cosmology Workshop</i> , MIT	August 11, 2015
<i>Density Perturbation Group Talk</i> , MIT	July 27, 2015
<i>Kenyon/Dartmouth/MIT Undergrad Cosmology Workshop</i> , MIT	August 11, 2014
<i>Density Perturbation Group Talk</i> , MIT	June 26, 2014

PROFESSIONAL ACTIVITY

Member (Affiliated Scientist)

Simons Collaboration on Extreme Electrodynamics of Compact Sources 2023–

Co-organizer/Host

Dark Cosmos Seminar Series, (Princeton University) 2023–

Astrophysics Coffee, (Princeton University) 2023–

Quantum Probes of Wave-like and Sub-GeV Dark Matter (PCTS) October, 2023

Cosmological and Astrophysical Probes of New Physics (PCTS) April, 2022

Referee: European Physical Journal C (2021–), Phys.Rev.Lett.(2023–), Phys.Rev.D (2023–)

TEACHING & MENTORING

Teaching Assistant

<i>Mechanics</i> (Stanford University)	Autumn, 2020
<i>Electricity and Magnetism</i> (Stanford University)	Spring, 2020, Winter, 2021
<i>Intermediate Electricity and Magnetism I</i> (Stanford University)	Winter, 2020
<i>Light and Heat</i> (Stanford University)	Autumn, 2019

Students Mentored/Co-mentored*

* Student stage is listed at the time collaboration began.

<i>Nicholas Rapidis</i> , 1st year PhD candidate (Stanford University)	2019–2020
<i>Dion Noordhuis</i> , 2nd year PhD candidate (University of Amsterdam)	2022–2023
<i>Sandip Roy</i> , 3rd year PhD candidate (Princeton University)	2023–
<i>Mariia Khelashvili</i> , visiting 4th year PhD student (Princeton University)	2023–
<i>Hanako Helton</i> , Junior undergraduate student (Princeton University)	2023–
<i>Dawei Dai</i> , Undergraduate exchange student (Tsinghua University)	2023–