

Sanika Khadkikar

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EDUCATION

The Pennsylvania State University, State College, PA 2022

Ph.D. in Physics

Exploring the fundamental physics of neutron stars using astrophysics and gravitational waves, advisor Bangalore Sathyaprakash

Birla Institute of Science and Technology, Pilani, India 2017 - 2022

M. Sc. (Hons) in Physics

B.E. (Hons) in Mechanical Engineering

Quasi-stationary sequences of hyper-massive neutron stars with exotic equations of state, advisor Sarmistha Banik

The Pennsylvania State University, State College, PA 2021 - 2022

BITS Pilani Master's Thesis exchange program

Binary neutron star post-merger signal analysis using wavelet transforms, advisor Bangalore Sathyaprakash and Sujith R.

RESEARCH INTERESTS

Neutron stars, gravitational-wave data analysis, black holes, multimessenger astronomy, compact-object binaries, nuclear astrophysics, next-generation gravitational-wave detectors, dark matter

SELECTED FELLOWSHIPS AND HONORS

Distinguished Student Award *American Physical Society* 2025

W. Donald Miller Graduate Fellowship, *Pennsylvania State University* 2025

David C. Duncan Graduate Fellowship, *Pennsylvania State University* 2025

Division of Gravitational Physics Travel Grant, *American Physical Society* 2025

Peter Eklund Award for Scientific Communication (*Honorable mention*), *Pennsylvania State University* 2025

ACCESS Computing Grant (Co-PI), *National Science Foundation* 2024

I am STEM Award, *Pennsylvania State University* 2024

Homer F. Braddock Scholarship in Biology, Chemistry, and Physics, *Pennsylvania State University* 2022

Off-Campus International Master's Thesis Fellowship, *Birla Institute of Technology and Science* 2021

Charpak Indo-France Research Scholarship, *Government of France* 2021

LIGO Summer Undergraduate Research Fellowship (SURF), *California Institute of Technology* 2020

BITS Pilani Merit Scholarship, *Birla Institute of Technology and Science* 2018- 2021

INSPIRE Award, *Government of India* 2014

PUBLICATIONS

- Khadkikar, S., et al. (2025). Cosmic Calipers: Precise and Accurate Neutron Star Radius Measurements with Next-Generation Gravitational Wave Detectors. arXiv. <https://arxiv.org/abs/2502.03463>.
- Gupta, I., et al. (2023). Characterizing gravitational wave detector networks: From A# to Cosmic Explorer. *Class.Quant.Grav.* 41 (2024) 24, 245001. <https://doi.org/10.1088/1361-6382/ad7b99>
- Evans, M., et al. (2023). Cosmic Explorer: A submission to the NSF MPSAC ngGW Subcommittee. arXiv. <https://arxiv.org/abs/2306.13745>
- Khadkikar, S., Mangat, C. S., and Banik, S. (2022). Quasi-stationary sequences of hyper-massive neutron stars with exotic equations of state. *Journal of Astrophysics and Astronomy*, 43(2), 57. <https://doi.org/10.1007/s12036-022-09849-0>
- Khadkikar, S., Raduta, A. R., Oertel, M., and Sedrakian, A. (2021). Maximum mass of compact stars from gravitational wave events with finite-temperature equations of state. *Physical Review C*, 103(5), 055811. <https://doi.org/10.1103/PhysRevC.103.055811>

INVITED TALKS

Astronomy on Tap, <i>State College, PA</i>	2025
AstroChat Talk at University of California, Berkeley, <i>Berkeley CA</i>	2025
Department Colloquium at California State University Fullerton, <i>Fullerton CA</i>	2025
Einstein Telescope Nuclear Astrophysics Call <i>virtual</i>	2025

CONTRIBUTED TALKS

Neighborhood Workshop, <i>State College, PA</i>	2025
American Physical Society Global Summit Meeting 2025, <i>Sacramento, CA</i>	2025
American Astronomical Society 245 Meeting, <i>Oxon Hill, MD</i>	2025
LIGO -Virgo Collaboration Meeting, <i>virtual</i>	2024
American Physical Society April Meeting 2024, <i>Sacramento, CA</i>	2024
Penn State Primordial Universe and Gravity Seminar, <i>State College, PA</i>	2021, 2023, 2024
LIGO-SURF Presentation at California Institute of Technology (<i>virtual</i>)	2020
Finesse interferometric modelling workshop and Hackathon at IUCAA <i>Pune, India</i>	2020

TEACHING AND MENTORSHIP

Graduate Teaching Assistant	2022-2024
<i>Department of Physics, Pennsylvania State University</i>	
Quantum Information and Computing	
Introductory Electromagnetism	
Introductory Mechanics	
Undergraduate Teaching Assistant	2020
<i>Department of Physics, BITS Pilani</i>	
Statistical Mechanics	

SERVICE, LEADERSHIP AND OUTREACH

Graduate Student Newsletter Editorial Team 2025
Eberly College of Science Office of Communications, Pennsylvania State University

Responsible for editing and managing content, ensuring engaging and informative communication for the graduate student community.

GAPP Graduate Student Liaison 2024
Department of Physics, Pennsylvania State University

Instrumental in arranging and managing the Gravity, Astrophysics and Particle Physics (GAPP) seminars at Pennstate along with faculty

PAW Pals Volunteer 2023-2024
Physics and Astronomy for Women+, Pennsylvania State University

PAW Pals go to local elementary schools to do demonstrations and discussions to engage kids in science.

Gravi-tea Time Podcast 2024
Institute of Gravitation and the Cosmos (IGC), Pennsylvania State University

One of the creators of the podcast aimed towards bringing the latest breakthroughs in gravitational physics and astrophysics straight from the researchers, explained in a nuanced yet accessible way for advanced undergrads and grad students

Physics Journal Club 2021
BITS Hyderabad

Founder of this journal club in BITS Hyderabad which aims to foster collaborative learning and in-depth discussions on research in physics

AD ASTRA: Astronomy and Science Club 2019
BITS Hyderabad

As the secretary, I helped initiate various projects, including the horn antenna for plotting galaxy rotation curves, organized events during college fests, and coordinated astronomy and astrophysics trivia sessions.

Team Vulcan Racing 2019
BITS Hyderabad

Team Vulcan is the Off-roading Automobile team in BITS Pilani, Hyderabad Campus. The team consists of various sub departments like: Suspension, Powertrain, Design & Simulations, Braking, Management & Sponsorship etc. I was the team manager and a suspension design engineer.