

ROWINA NATHAN

PhD Candidate

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RESEARCH

12 Publications

2 First Author Publications

1300+ citations

h-index: 6 (95th percentile for astronomy PhD students in Australia)

Invited speaker and conference organiser at conferences across Australia and Europe

MEDIA

ABC News TV Interview

Gravitational-wave background discovery

Cosmos Magazine

Issue 102 scientist profile

Instagram and TikTok Science Communicator

3M+ views, 12K+ followers

Astrophysicist with extensive experience in data analysis, machine learning, and statistical modelling. Proven track record of contributing to large-scale, data-driven projects and collaborating across international research teams. Skilled in quantitative analysis, programming, and cross-disciplinary communication. Seeking a role in trading to apply technical expertise to solve complex industry challenges.

SKILLS

Data Analysis & Machine Learning: Bayesian inference, deep learning, data visualisation, signal processing, time-series analysis

Technical Proficiencies: Python, R, Fortran, bash scripting, high performance computing, Git, statistics, pipeline development

Collaboration & Communication: Cross-functional collaboration, science communication via social media (3M+ views), workshop facilitation, mentoring, event organisation, public speaking

EMPLOYMENT

Teaching associate | Monash University | 2022 - Present

Delivered hands-on workshops and labs for Astronomy and Physics courses at all undergraduate levels, engaging students in complex astrophysical concepts through practical applications. Managed project timelines and communicated effectively with academic teams, fostering a collaborative environment.

Social Media Coordinator | Monash Astrophysics | 2023 - Present

Responsible for running the Instagram, Facebook, Twitter, Linked-in and Bluesky accounts for Monash University Astrophysics.

Head Teacher | Code Camp | 2018 - 2022

Taught coding to children aged 6 to 13 in a classroom setting, helping them find a passion for STEM subjects from an early age.

Finance and Performance Intern | Deloitte Australia | 2019

Assisted on a project implementing Workday Financials at a tertiary institution. Gained experience in data integrity checks, reporting, and stakeholder engagement within a corporate environment. Created value adds for the client such as a self-checking financial reports and quick-view dashboards.

Short Term Staff | Kandersteg International Scout Center | 2018 - 2020

Alpine ski guiding and internal chalet operations in the remote Swiss Alps.

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OUTREACH

OzGrav Education and Public Outreach Coordinator

Monash Node, 10+ school visits and outreach events

Women and Non-binary People+ in Physics and Astronomy Committee Member and Mentor

Girls in Physics Breakfast

Vicphysics Teachers' Network, visiting physicist, 2023, 2024

AWARDS

2023 OzGrav Outreach Award Highly Commended

2023 Astronomical Society of Australia Talk Prize Honourable Mention

2021 Faculty of Science Dean's List Award

2022 Rhodes Scholarship Shortlist

2021 J.L Williams Scholarship

EDUCATION

PhD in Astrophysics | Monash University | 2022 - 2025

Profile domain timing, gravitational-wave background sky-mapping, pulsar physics

Honours in Astrophysics | Monash University | 2021

Dynamic pulse fitting, profile domain timing, pulsar glitches

Bachelor of Science | Monash University | 2017 - 2020

Majors in Astrophysics, Minor in Mathematics

Bachelor of Commerce | Monash University | 2017 - 2020

Major in Business Analytics

RESEARCH HIGHLIGHTS

The MeerKAT Pulsar Timing Array: Maps of the gravitational-wave sky with the 4.5 year data release.

- Co-led the development of data pipelines and algorithms for gravitational-wave mapping using 4.5 years of MeerKAT data.
- Utilized Python and HPC to process large datasets, achieving the most detailed gravitational-wave background skymaps to date, including a 2-sigma hotspot at 7 nHz.

Improving pulsar-timing solutions through dynamic pulse fitting.

- Developed a timing method using basis functions to enhance pulse profile accuracy in PSR J1103-5403, increasing timing precision by 78% and gravitational-wave sensitivity by 32%.
- Identified mode-changing behaviour, offering new insights into pulsar dynamics.

A Physically Motivated Neural Network for Inferring Stellar Parameters

- Designed a variational auto-encoder in TensorFlow to improve stellar parameter measurements, applying physics-informed architecture for enhanced accuracy and generalisability.

Machine Learning Model for Predicting Tennis Point Outcomes

- Developed a machine learning model in R achieving 92.86% prediction accuracy, surpassing 28 competing models in a Business Analytics group project.