# ROWINA NATHAN

PhD Candidate

rowina.nathan@gmail.com

+61 421 060 097

Melbourne, Australia

rowina-n.github.io

## COLLABORATIONS

Parkes Pulsar Timing Array

MeerKAT Pulsar Timing Array

International Pulsar Timing Array

OzGrav ARC

LIGO-Virgo-Kagra Scienfitifc Collaboration

## MEDIA

**ABC News TV Interview**
Gravitational-wave background discovery

**Cosmos Magazine**
Issue 102 scientist profile

**Instagram and TikTok Science Communicator**
3M+ views, 12K+ followers

## RESEARCH INTERESTS

Pulsar timing, gravitational-wave background, cosmic variance, bayesian inference, machine learning, pulsar glitches, physics education, data visualisation, graphic design.

## EDUCATION

**PhD in Astrophysics | Monash University | 2022 - 2025**
Thesis due August 2025
Supervised by Paul Lasky, Eric Thrane and Greg Ashton
Dynamic pulse fitting, cosmic variance, gravitational-wave background sky-mapping

**Honours in Astrophysics | Monash University | 2021**
Supervised by Paul Lasky and Greg Ashton
Dynamic pulse fitting, profile domain timing, pulsar glitches
2021 Faculty of Science Dean's List Award

**Bachelor of Science | Monash University | 2017 - 2020**
Majors in Astrophysics, Minor in Mathematics

**Bachelor of Commerce | Monash University | 2017 - 2020**
Major in Business Analytics

## PUBLICATIONS

### FIRST-AUTHOR

Grunthal, K. & **Nathan, R. S.**, et al. (2024). The MeerKAT Pulsar Timing Array: Maps of the gravitational-wave sky with the 4.5 year data release. Monthly Notices of the Royal Astronomical Society *(submitted)*

**Nathan, R. S.,** et al. (2023). Improving pulsar-timing solutions through dynamic pulse fitting. Monthly Notices of the Royal Astronomical Society, 523(3), 4405-4412.

### CO-AUTHOR

Miles, M. T., et al., (2024). The MeerKAT Pulsar Timing Array: The first search for gravitational waves with the MeerKAT radio telescope. Monthly Notices of the Royal Astronomical Society *(submitted)*

Miles, M. T., et al., (2024). The MeerKAT Pulsar Timing Array: The 4.5-year data release and the noise and stochastic signals of the millisecond pulsar population. Monthly Notices of the Royal Astronomical Society *(submitted)*

Tong, H., Guttman, N., Clarke, T. A., Lasky, P. D., Thrane, E., Payne, E., ... & Di Marco, V. (2024). Transdimensional inference for gravitational-wave astronomy with Bilby. arXiv preprint arXiv:2404.04460.

Zic, A., Reardon, D. J., Kapur, A., Hobbs, G., Mandow, R., Curyło, M., ... & Zhu, X. J. (2023). The Parkes Pulsar Timing Array Third Data Release. Publications of the Astronomical Society of Australia, 40, e049.

Reardon, D. J., Zic, A., Shannon, R. M., Di Marco, V., Hobbs, G. B., Kapur, A., ... & Zhu, X. J. (2023). The gravitational-wave background null hypothesis: Characterizing noise in millisecond pulsar arrival times with the Parkes Pulsar Timing Array. The Astrophysical Journal Letters, 951(1), L7.

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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

## SUPERVISION

**Modelling Glitch Rises in Pulsars**
Jennifer Quinlan
Honours and Undergraduate project

**Dynamic Precision Pulsar Timing using Trans-dimensional Bayesian Inference**
Ella Garth
Undergraduate project

## PUBLICATIONS

Reardon, D. J., Zic, A., Shannon, R. M., Hobbs, G. B., Bailes, M., Di Marco, V., ... & Zhu, X. J. (2023). Search for an isotropic gravitational-wave background with the Parkes Pulsar Timing Array. The Astrophysical Journal Letters, 951(1), L6.

Sarin, N., Lasky, P. D., & **Nathan, R. S.** (2023). Missed opportunities: GRB 211211A and the case for continual gravitational-wave coverage with a single observatory. Monthly Notices of the Royal Astronomical Society, 518(4), 5483-5489.

Ashton, G., Lasky, P. D., **Nathan, R.,** & Palfreyman, J. (2020). Flickering of the Vela pulsar during its 2016 glitch. arXiv preprint arXiv:2011.07927.

## WORKSHOPS AND CONFERENCES

International Pulsar Timing Array Science Meeting | 2024
Contributed talk

International Pulsar Timing Array Student Week | 2024
Invited Talk

European Pulsar Timing Array Science Meeting | 2024
Invited Talk

International Pulsar Timing Array Science Meeting | 2023
Contributed talk and Local organising committee

International Pulsar Timing Array Student Week | 2023
Organising committee

Gravitational Wave Physics and Astronomy Workshop | 2022
Poster

Astronomical Society of Australia Scientific Meeting | 2022, 2023
Contributed talk and Talk prize honourable mention (2023)

Australian National Institute of Theoretical Astrophysics Meeting | 2022, 2023
Contributed Talk and Summer School Session Assistant (2023)

OzGrav retreat | 2021 - 2023
Contributed Talk and Outreach Award Highly Commended (2023)

## EMPLOYMENT

**Teaching associate | Monash University | 2022 - Present**
Experience delivering workshops and labs for Introductory Astronomy (ASP1010), Astrobiology (ASP1022), Introduction to Astrophysics (APS2062), Observational Astronomy (ASP3231) and Relativity and Cosmology (ASP3051).

**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.

**Short Term Staff | Kandersteg International Scout Center | 2018 - 2020**
Alpine ski guiding and internal chalet operations in the remote Swiss Alps.