

ROWINA NATHAN

ASPIRING TEACHING ASSISTANT

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DETAILS

0421060097
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Australian Citizen

LINKS

[Linked-In](#)

SKILLS

Machine Learning

Data Visualisation

R

Python

Fortran

Git

HPC

Deep Learning

Data Analysis

Workday Financials



PROFILE

Aspiring PhD candidate, current honours student. Experience educating children of all backgrounds and ages 6 - 18. Enjoys inspiring and helping young people into a career in STEM. Passionate about education, coding, technology and machine learning, with a particular interest in data visualisation and story telling.



EDUCATION

Honours in Astrophysics, Monash University

2021 — 2021

Recipient of the J.L Williams Scholarship

2021 Faculty of Science Dean's List Award

2022 Rhodes Scholarship Shortlist

The honours degree consists of two components, course work and a research project. For my coursework I have undertaken units in computational astrophysics, stellar astrophysics, advanced observational astronomy, general relativity, advanced data analysis and machine learning. I achieved an average mark of 85% in the coursework component. I am currently undertaking the research component, my project is outlined below.

Bachelor of Science and Bachelor of Commerce, Monash University

2017 — 2020

Majors: Astrophysics and Business Analytics, Minor: Mathematics

Weighted Average Mark: High Distinction

As part of my degree, I worked on cutting-edge research projects with professional astrophysicists, analysing telescope data with innovative techniques including neural networks, and other machine learning techniques. My research is outlined in more detail below.

During my studies I also completed courses in machine learning, time series analysis, forecasting, Bayesian statistics, data visualisation, databases and computing. As part of a group project for Business Analytics my group created a machine learning model that was the best at predicting the outcome of a point in tennis. Our model correctly predicted 92.86% of point outcomes, which was higher than the other 28 models submitted.

Year 12 Graduate, Shelford Girls' Grammar

2016

ATAR: 96.65



EMPLOYMENT HISTORY

Head Teacher at Code Camp

December 2017 — Present

I teach coding to children aged 6 to 13 in a classroom setting, managing conflict, breaking down difficult concepts and helping them find a passion for STEM subjects from an early age.

Private Tutor

January 2017 — Present

I help students from years 6 to 12 to keep up in the classroom at school by explaining mathematics to them in a fun and engaging way.

Finance and Performance Intern at Deloitte Australia

May 2021 — May 2021

I assisted on a project implementing Workday Financials at RMIT. I was able to understand the needs of the client, adapt to new software quickly and create value adds for the client such as a self-checking financial reports and quick-view dashboards.

Guest Services at Kandersteg International Scout Center, Switzerland

2018 — 2020

I worked with 35 people from over 20 different nationalities. Living in the remote Swiss Alps I had manage guest needs in an environment with limited resources.

<https://www.kisc.ch/news/power-positivity-kisc>

Tutor at Kids Like Us

January 2017 — July 2017

I worked with children with a range of learning difficulties to help them to implement their ideas for games a program in Scratch.

★ RESEARCH

The influence of neutron star pulse profile evolution on pulsar timing

March 2021 — November 2021

Neutron stars pulsate so regularly that some are more accurate than atomic clocks. For this reason, they can be used to measure small perturbations in space-time and therefore gravitational waves. For my honours project I am aiming to quantify the effect of pulse profile evolution on neutron star timing to see if timing measurements can be improved. To do this I am fitting shapelet models to individual pulses to see if the pulse time of arrival is different compared to traditional methods and to say if the uncertainties are different. This project is particularly interesting as small changes in pulsar timing can be used to measure very low frequency gravitational waves including primordial gravitational waves that were generated just after The Big Bang.

A Physically Motivated Neural Network for Inferring Stellar Parameters

July 2020 — November 2020

My second research project was aiming to improve the quality, accuracy and speed of stellar parameter measurements from stellar spectra. As part of my project I:

- Created two neural networks in Tensorflow to predict stellar spectra and stellar parameters.
- I applied physical laws to constrain the neural network, previous neural networks were not constrained, gave results that misleading and were not able to be applied to new data sets. The results of my approach were consistent with existing astronomical measurement data.

The Changing Shape of Neutron Star Pulses

March 2020 — June 2021

My first research project was aiming to characterise the shape of individual neutron star pulses to better understand neutron star physics. The tasks I undertook were:

- Explored a variety of statistical methods for pulse shape analysis.
- Found that maximum likelihood estimation is much faster and more rigorous to fit pulse shapes than traditional methods.
- Co-authored two journal papers: *Flickering of the Vela pulsar during its 2016 glitch* (<https://arxiv.org/abs/2011.07927>) and *Neutron Star Extreme Matter Observatory: A kilohertz-band gravitational-wave detector in the global network* (<https://arxiv.org/abs/2007.03128>).

✿ VOLUNTEER WORK

Mentor at Women in Astrophysics Mentoring Program, Monash University

2019 — Present

Daytrips Coordinator at Monash University Snowsports Club

2021

Secretary at Everest Le Page Rover Crew, Beaumaris

2021

Chairperson at Everest Le Page Rover Crew, Beaumaris

2020