Sean Richards

PhD Candidate · Department of Physics

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Education

The University of Auckland — *Auckland, New Zealand*

PhD (Physics) — *September 2021 - Present*

- Supervisors: Prof. Jan (JJ) Eldridge & Assoc. Prof. Nicholas Rattenbury
- Thesis: *The Next Generation: Refining the Standard Population Synthesis Model to Better Predict Stellar Population Properties*
- Expected Completion Date: **April–May 2025**

The University of Auckland — *Auckland, New Zealand*

MSc (Physics) — *March 2020 - March 2021*

- Supervisor: Prof. Jan (JJ) Eldridge
- Thesis: *The Missing Mergers: Modelling the observed binary neutron-star population and their mergers*
- Awarded with **Honours (First Class)**

The University of Auckland — *Auckland, New Zealand*

PGDipSci (Physics) — *March 2019 - February 2020*

- Supervisor: Assoc. Prof. Nicholas Rattenbury
- Dissertation: *The University of Auckland Ground Station One*
- Technical report: *The University of Auckland Ground Station One: System Overview*
- Technical report: *Ground Segment Support for APSS-I* (contains non-public information, and cannot be distributed)

The University of Auckland — *Auckland, New Zealand*

BSc — *February 2016 - November 2018*

- Majored in Physics and Computer Science

Awards, Fellowships, & Grants

2021 **University of Auckland Doctoral Scholarship**, The University of Auckland

2019 **First in Course Award (PHYSICS 746)**, The University of Auckland

Presentations

** presenting author; + mentored undergraduate*

Contributed Presentations

Richards, S*. 2022. *New constraints on the Bray conservation-of-momentum natal kick model from multiple distinct observations.* Oral presentation: Supernovae in the Gravitational Wave Detection Era, Melbourne, Victoria, Australia.

Richards, S*, Eldridge, J, Briel, M, Ghodla, S. 2024. *The variable evolution of accretor stars in binary systems due to accretion of increasingly helium-rich material.* Oral presentation: Annual Scientific Meeting of the Astronomical Society of Australia (online).

Richards, S 2024. *A fate written in stardust: Probing the interiors of interacting binary stars.* Oral presentation: The 2nd Faculty of Science Pacific Research Symposium, Auckland, New Zealand.

Teaching Experience

2023-2025	**PHYSICS 102 Tutor**, Department of Physics	*The University of Auckland*
2021-2023	**Tuākana Tutor**, Department of Physics	*The University of Auckland*
2018-	**ASTRO 100 / PHYSICS 107**, Graduate Teaching Assistant	*The University of Auckland*

Research Experience

University of Auckland - Department of Physics *Auckland, NZ*

Supervisor: Assoc. Prof. Nicholas Rattenbury *June 2023 - December 2023*

- Research Assistant: University of Auckland Ground Station One

University of Auckland - Department of Physics *Auckland, NZ*

Supervisor: Prof. Jan (JJ) Eldridge *April 2021 - September 2021*

- Research Assistant

University of Auckland - Department of Physics *Auckland, NZ*

Supervisor: Assoc. Prof. Nicholas Rattenbury *December 2019 - February 2020*

- Summer Research Scholar: "Ground Segment Support for APSS-I"
- This report is non-distributable due to a non-disclosure agreement

Outreach & Professional Development

Service and Outreach

2023-2025	**Department of Physics Equity Committee**, Member	*The University of Auckland*
2021	**Post-Graduate Students Association**, Welfare Vice President	*The University of Auckland*
2021	**Physics Association of the University of Auckland**, Vice President	*The University of Auckland*
2020	**Physics Association of the University of Auckland**, Treasurer	*The University of Auckland*
2018	**Physics Association of the University of Auckland**, Committee Member	*The University of Auckland*

Publications

Published

Richards, S., Eldridge, J., Briel, M., Stevance, H., Willcox, R. 2022. New constraints on the Bray conservation-of-momentum natal kick model from multiple distinct observations. Monthly Notices of the Royal Astronomical Society.

Stevance, H., Ghodla, S., **Richards, S.**, Eldridge, J., Briel, M., Tang, P. 2022. VFTS 243 as predicted by BPASS models. Monthly Notices of the Royal Astronomical Society.

In Review

Richards S., Eldridge J., Briel M., Ghodla S. 2024. The variable evolution of accretor stars in binary systems due to accretion of increasingly helium-rich material.

In Prep

Richards S., Eldridge J. 2024. Detailed models of overcontact binary stars.