

MATTHEW FROSST

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PROFESSIONAL SUMMARY

PhD candidate in computational astrophysics with deep expertise in high performance supercomputing, software development, data analysis, machine learning, and statistical modelling. Extensive experience leading national and international collaborations, and applying advanced computational techniques to extract meaningful insights from complex datasets. Transitioning to a career in industry, with a particular focus on data analytics, strategy, and risk management, and seeking to leverage advanced computational skills to efficiently drive data-driven decision-making. Proven ability to optimise computational workflows, develop innovative solutions, and translate complex data into actionable insights.

EDUCATION

PhD (Computational Astrophysics)

University of Western Australia, International Centre for Radio Astronomy Research

Perth, Australia

2022 - November, 2025

Thesis topic: *A Statistical View of Barred Galaxy Formation in Simulated Cosmological Volumes*

Led several multinational research collaborations focused on accurately executing high-resolution simulations of galaxy evolution on world-leading high performance supercomputers. Developed new methods for studying galaxy structure and evolution in massive, time-variable simulation datasets by applying statistical data analysis, computational modelling, and machine learning. Responsible for the operation and analysis of $\sim 150+$ million CPU-hours of simulation data, valued at $> \$30$ million USD.

Master's of Science (Physics, Engineering Physics and Astronomy)

Queen's University

Kingston, Canada

2019 - 2022

Thesis topic: *The Diversity of Spiral Galaxies Explained*

Bachelor of Science (Physics, Engineering Physics and Astronomy), Honours

Queen's University, Kingston

Kingston, Canada

2015 - 2019

WORK AND SELECTED LEADERSHIP EXPERIENCE

ESO Science Support Discretionary Fund Scholarship Recipient

European Southern Observatory

Munich, Germany

2025 - present

- Recipient of prestigious Science Support Discretionary Fund Scholarship to undertake research with European partners.
- Developed advanced models to compare galaxy simulations to telescope observations by applying knowledge of numerical modelling and Bayesian data analysis while accounting for real-time measurement errors.

PhD Candidate Representative

International Centre for Radio Astronomy Research, University of Western Australia

Perth, Australia

2024 - 2025

- Advocated on behalf of PhD student interests at monthly Senior Staff meetings.
- Oversaw a PhD stipend increase of \$1,200 USD, the creation of a \$45,000 USD cash pool for article publication fees for PhD students, and a reorganisation of the PhD annual milestones that promoted efficiency and high-quality research.

Computational–Theory Group Chair

International Centre for Radio Astronomy Research, University of Western Australia

Perth, Australia

2022 - 2024

- Led weekly meetings of the Computational–Theory Group, a UWA science unit focused applying state-of-the-art supercomputer simulations and sophisticated theoretical models to astrophysical problems.
- Organised conferences, speaker presentations, and community events (e.g., monthly BBQ's and an annual half-marathon charity run).

Consultant Data Scientist

Queen's University

Kingston, Canada

2017 - 2019

- Led team to provide data analysis and data visualisation support for the Queen's University Physics Department.
- Communicated key analytics to department leadership through technical reports, dashboards, and presentations, resulting in better student retention, increased student test scores, and a reduced workload for teaching assistants.

TECHNICAL STRENGTHS, ACTIVITIES, AND INTERESTS

Software Engineering

Python (numpy, pandas, scikit-learn), C++, R, Fortran-95, SQL

System Admin and Publishing

GNU/Linux, Git, Bash, Slurm, L^AT_EX

Highlighted Activities

Volunteer on Local Organising Committees (LOC) for 3 national science meetings

Interests

Ironman triathlon, chess, and Space & Science educational outreach

– References available upon request. –