CURRICULUM VITAE
A. MAKAI BAKER

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EDUCATION

University of California, Berkeley   2025 - present
Ph.D. Candidate, Physics
Chancellor's Fellow

Monash University (Australia)   2021 - 2024
BSc. Advanced Research (Honours), Physics and Pure Mathematics

AWARDS AND SCHOLARSHIPS

Chancellor's Fellowship   2025-2026
University of California, Berkeley

Centennial Fellowship (declined)   2025-2026
Princeton University

Rodney L. Turner Prize   2024
Dept. of Physics & Astronomy, Monash University

J. L. Williams Honours Scholarship   2024
Dept. of Physics & Astronomy, Monash University

William A. Rachinger Prize   2023
Dept. of Physics & Astronomy, Monash University

PUBLICATIONS

Authors listed in order of contributions.

[1] **A. M. Baker**, E. Thrane, P. Lasky, J. Golomb (Accepted to PRD)
Significant challenges for astrophysical inference with next-generation gravitational-wave observatories.
DOI: 2503.04073

[2] **A. M. Baker**, E. Thrane, P. Lasky, et al. (APJS)
GWCloud: a searchable repository for the creation and curation of gravitational-wave inference results (2023)
DOI: 10.3847/1538-4365/acc938

[3] N. Sahu et al. (including **A. M. Baker**) (APJ)
AGEL: Is the Conflict Real? Investigating Galaxy Evolution Models using Strong Lensing at $0.3 < z < 0.9$ (2024)
DOI: 10.3847/1538-4357/ad4ce3

[4] T. Barone et al. (including **A. M. Baker**) (in preparation)
The AGEL Survey Data Release 2: A Gravitational Lens Sample for Galaxy Evolution and Cosmology.

RESEARCH PROJECTS

1. **Limits to Reduced Order Modelling of Gravitational Wave Signals** 2024
   Dept. of Physics & Astronomy, Monash University
   Supervisors: Eric Thrane, Paul Lasky
   Discovered that reduced order modelling fails to approximate low-frequency gravitational wave signals. Built reduced order models that include a number of detector effects for the first time. Developed generalised reduced order modelling code and gravitational-wave specific pipeline.

2. **Analysis of Lensing Models using Machine Learning (See publication [2])** 2024
   Harvard-Smithsonian Centre for Astrophysics
   Supervisor: Kim-Vy Tran
   Applied machine learning methods to Hubble Space Telescope imaging to analyse gravitationally lensed galaxies.

3. **Localisation of Binary Neutron Star Mergers with Third Generation Gravitational Wave Detectors** 2023
   Dept. of Physics & Astronomy, Monash University
   Supervisors: Eric Thrane, Paul Lasky
   Keywords: binary neutron star mergers, sky localisation, next-generation detectors.

4. **Using an Aligned Spin Model to Investigate the Distribution of Spins in Binary Black Holes** 2022-2023
   Dept. of Physics & Astronomy, Monash University
   Supervisors: Eric Thrane, Paul Lasky
   Keywords: black hole spins, physical models, Bayesian inference.

5. **Illuminating the Dark Universe with Gravitational Lensing (See publication [2])** 2022-2023
   School of Physics, University of New South Wales
   Supervisor: Kim-Vy Tran
   Reduced images from the Hubble Space Telescope to determine galaxy scaling relationships. Used Ppxf to extract velocity dispersions and other galactic kinematics from gravitational lens deflectors.

6. **Gravitational Waves from Fundamental Symmetry Breaking** 2022-2023
   Dept. of Physics & Astronomy, Monash University
   Supervisor: Csaba Balazs
   Keywords: electroweak phase transition, first order symmetry breaking, gravitational waves.

7. **GWCloud: a Searchable Repository for the Creation and Curation of Gravitational-Wave Inference Results (See publication [1])** 2021-2022
   Dept. of Physics & Astronomy, Monash University
   Supervisors: Eric Thrane, Paul Lasky
   Aided in the development of GWCloud and utilised its API to analyse properties of binary black holes.

OUTREACH

Faculty of Science Honours Information Seminar 2024
Delivered a talk to prospective honours students in the Faculty of Science at Monash University.

SKILLS

Python, Parallel computing, High Performance Computing (HPC), LaTex.