

# CURRICULUM VITAE

A. MAKAI BAKER

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## EDUCATION

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<b>University of California, Berkeley</b> Ph.D. Candidate, Physics Chancellor's Fellow	2025 - present
<b>Monash University (Australia)</b> BSc. Advanced Research (Honours), Physics and Pure Mathematics	2021 - 2024

## AWARDS AND SCHOLARSHIPS

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<b>Chancellor's Fellowship</b> <i>University of California, Berkeley</i>	2025-2026
<b>Centennial Fellowship (declined)</b> <i>Princeton University</i>	2025-2026
<b>Rodney L. Turner Prize</b> <i>Dept. of Physics &amp; Astronomy, Monash University</i>	2024
<b>J. L. Williams Honours Scholarship</b> <i>Dept. of Physics &amp; Astronomy, Monash University</i>	2024
<b>William A. Rachinger Prize</b> <i>Dept. of Physics &amp; Astronomy, Monash University</i>	2023

## PUBLICATIONS

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Authors listed in order of contributions.

- [1] **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](https://doi.org/10.3847/1538-4365/acc938)
- [2] 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](https://doi.org/10.3847/1538-4357/ad4ce3)
- [3] **A. M. Baker**, E. Thrane, P. Lasky, J. Golomb (in preparation)  
*Can we do accurate astrophysical inference with next-generation gravitational-wave observatories?*
- [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

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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

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

## SKILLS

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