Eric Muller

Canberra, Australia

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EDUCATION

The Australian National University   2024 – Current

PhD in Astronomy and Astrophysics

- Thesis: Machine Learning Methods for Cold HI Measurements
- Supervisors: Dr. Hiep Nguyen, Prof. Naomi McClure-Griffiths, Dr. Andrew Battisti (ICRAR/UWA), Dr. Cheng Soon Ong (Data61/CSIRO)

The Australian National University   2020 – 2023

Bachelor of Science (Advanced) (Honours)

- Honors in Astronomy and Astrophysics
- Specialisation in Advanced Physics
- Major in Astronomy and Astrophysics
- Minor in Mathematics
- Graduated with First Class Honours, GPA of 6.323/7

RESEARCH EXPERIENCE

MAGPI Research Collaboration Member   2023 – Current

- Current member of the Middle Ages Galaxy Properties with Integral field spectroscopy (MAGPI) research collaboration, with paper in preparation (2023)

Summer Research Scholar – MAVISIM   2023 – 2024

ANU RSAA / AITC / Northrop Grumman

Supervisors: Dr. Trevor Mendel, Dr. Jesse Cranney

- Project involved creating a spectrograph image simulator in Python for the MAVIS instrument. The project resulted in producing a research report and giving a colloquium presentation.

ASTRO3D Member   2023 – 2024

ARC Centre of Excellence for All Sky Astrophysics in 3 Dimensions   *Canberra, ACT*

- Current member of the ARC Centre of Excellence for All Sky Astrophysics in 3 Dimensions (ASTRO3D)

Undergraduate Student Researcher   2022

ANU RSAA   *Weston, ACT*

Supervisor: Dr. Andrew Battisti

- Thesis: Characterising the Spatial Variation of Dust Attenuation in Galaxies

Summer Research Scholar – DREAMS Telescope   2021 – 2022

ANU AITC / Northrop Grumman   *Weston, ACT*

Supervisor: Dr. Tony Travouillon

- Project involved conducting measurements in a lab environment using interferometry equipment, and producing a Python pipeline to analyse the data, to characterise optical components of a commissioned telescope. The project resulted in producing a research report and giving a colloquium presentation.

Work Experience

Academic Tutor   2024 – Current
Self Employed   *Canberra, ACT*

- Providing tutoring services, including both in-person and online session, and assignment feedback, for Primary- and Secondary-level students in the ACT. Involves a large amount of both written and oral communication with students and parents.

Academic Tutor   2022 – 2023
Futureproof Tutoring   *Canberra, ACT*

- *See above description.*

Outreach

Invited speaker   2023
ANU Astronomy Society

- Gave a colloquium on my Honours research to a mixed audience of astronomy students and general undergraduate students.

Publications

Foster, C., Donoghoe, M. W., Battisti, A., **et al.** 2025, "The MAGPI Survey: the kinematic morphology-density relation (or lack thereof) and the Hubble sequence at $z \sim 0.3$", *Publications of the Astronomical Society of Australia*, in press, arXiv:2502.16751

Mun, M., Wisnioski, E., Harborne, K. E., **et al.** 2025, "The MAGPI Survey: radial trends in star formation across different cosmological simulations in comparison with observations at $z \sim 0.3$", *Monthly Notices of the Royal Astronomical Society*, 538, 976.

Nguyen, H., Tang, H., Alger, M., **et al.** 2025, "TPCNet: representation learning for HI mapping", *Monthly Notices of the Royal Astronomical Society*, 536, 962.

Santucci, G., Lagos, C. D. P., Harborne, K. E., **et al.** 2024, "The MAGPI Survey: Orbital distributions, intrinsic shapes, and mass profiles for MAGPI-like EAGLE galaxies using Schwarzschild dynamical models", *Monthly Notices of the Royal Astronomical Society*, 534, 502.

Muller, E. G. M., Battisti, A. J., Bellstedt, S. in preparation, "Characterising the Spatial Variation of Dust Attenuation Across Cosmic Time"

Conferences, Meetings & Workshops

- 3rd Australia-ESO Meeting 2023, Canberra, ACT: Talk, poster, and LOC member
- 2023 ASTRO3D Science Meeting: Talk

Observing Experience

Anglo-Australian Telescope/Veloce: 16 nights as primary observer, including training other observers (2023 - 2025)

Successful Proposals

2025

- Lead CI of *Probabilistic Deep Learning for the Thermal Neutral Interstellar Medium Structure*, 2025, allocated 2 MSU of GPU time valued at $80,000 on the Gadi supercomputing system (National Computing Infrastructure) through the ASTAC allocation scheme.
- Researcher of *Thermal State of Neutral Atomic Medium in Galaxies: Neural Simulation-based Inference and Bayesian Deep-Learning Approaches*, 2025, allocated ~ 4 MSU of GPU time valued at $160,000 on the Gadi supercomputing system (National Computing Infrastructure) through the Flagship AI allocation scheme.

Skills

- **Programming Languages:** Python, bash/zsh, Mathematica, MatLab
- **Software:** LaTeX, terminal/remote computing, TopCat, SAO DS9, QFitsView, CARTA, version control with git, VS Code
- **Machine Learning:** pytorch, pyro
- **General:** HPC experience using the Gadi supercomputer (NCI)

Additional Information

- 2025/26 Recipient of the RSAA Supplementary Scholarship
- 2024 Recipient of the ANU Joan Duffield PhD Supplementary Scholarship
- 2023 Recipient of the Bok Honours Year in Astrophysics Scholarship
- 2023 Astronomical Computing course student representative