Tyler Fairnington

tfairnington@uchicago.edu — (+1) (773) 406-4386

Research Interests

Exoplanets — Exoplanet Atmospheres – Population Statistics – Bayesian Methods

Education

PhD in Astronomy & Astrophysics Sep. 2025 -
University of Chicago, United States

Bachelor of Science (Honours) in Physical Sciences Jul. 2020 - Dec. 2024
University of Southern Queensland, Australia
First Class Honours & University Medal
Average unweighted GPA: 7.00/7.00

Awards and Honors

University Medal 2024
- In recognition of outstanding academic achievements, awarded the University's most prestigious academic award.

Honors Thesis: The Eccentricity Distribution of Warm Sub-Saturns in *TESS* 2024
- Supervised by Dr Chelsea Huang, Dr Jiaying Dong & Dr George Zhou

Undergraduate Degree with Distinction 2024
- Exhibiting academic excellence in an undergraduate academic program

Academic Affairs Undergraduate Research Scholarship 2022–2023
- Awarded a research scholarship to conduct research on the TOI-5126 planet candidate system, using data from the NASA *Transiting Exoplanet Survey Satellite* and ESA's *Characterising Exoplanets Satellite*

First Author Publications

- **Fairnington, T.R.** et al., "TOI-5126: a hot super-Neptune and warm Neptune pair discovered by *TESS* and *CHEOPS*." *Monthly Notices of the Royal Astronomical Society* 527.3 (2023).
- **Fairnington, T.R.** et al., "The Eccentricity Distribution of Warm Sub-Saturns in *TESS*." *Monthly Notices of the Royal Astronomical Society* 540.1 (2025).
- **Fairnington, T.R.** et al., "The Eccentricity Distribution of *TESS* Single Warm Planets." *The Astrophysical Journal* (to be submitted).

Contributed Author Publications

- Vach, S., ... **Fairnington, T.R.** et al., "A transiting multi-planet system in the 61 million year old association Theia 116." *Monthly Notices of the Royal Astronomical Society* 540.1 (2025).

- Rodriguez, R., ... **Fairnington, T.R.** et al., "Discovery and Characterization of an Eccentric, Warm Saturn Transiting the Solar Analog TOI-4994." *The Astrophysical Journal* 169.2 (2025).

- Radzom, B., ... **Fairnington, T.R.** et al., "Evidence for Primordial Alignment: Insights from Stellar Obliquity Measurements for Compact Sub-Saturn Systems." *The Astronomical Journal* 168.3 (2024).

- Burt, J., ... **Fairnington, T.R.** et al., "TOI-1685 b Is a Hot Rocky Super-Earth: Updates to the Stellar and Planet Parameters of a Popular *JWST* Cycle 2 Target." *The Astrophysical Journal Letters* 971.12 (2024).

- Bieryla, A., ... **Fairnington, T.R.** et al., "TOI-4641b: An aligned warm Jupiter orbiting a bright (V=7.5) rapidly rotating F-star." *Monthly Notices of the Royal Astronomical Society* 527.4 (2023).

- Lowson, N., ... **Fairnington, T.R.** et al., "Two mini-Neptunes Transiting the Adolescent K-star HIP 113103 Confirmed with *TESS* and *CHEOPS*." *Monthly Notices of the Royal Astronomical Society* 527.1 (2023).

- Vach, S., ... **Fairnington, T.R.** et al., "A 16 Myr super-Neptune in Upper-Centaurus Lupus and a preliminary survey of transiting planets in Sco-Cen with TESS." *Astronomical Journal* (accepted).

- Morgan, M., ... **Fairnington, T.R.** et al., "Exploring Warm Jupiter Migration Pathways With Eccentricities. I. Catalog of Uniform Keplerian Fits to Radial Velocities of 200 Warm Jupiters." *The Astrophysical Journal Supplement* (submitted).

- Wells, T., ... **Fairnington, T.R.** et al., "The Spin-Orbit Alignment of Two Short Period Eclipsing Binary Systems." *Monthly Notices of the Royal Astronomical Society* (submitted).

Talks & Posters

Plenary Talk: "A Formation Dichotomy Revealed in the Eccentricity Distribution of *TESS* Warm Sub-Saturns" Nov. 2024
Stars in Brisbane & 10th Australian Exoplanet Workshop, USQ
Plenary Talk: "A Formation Dichotomy Revealed in *TESS* Single Warm Sub-Saturns" Aug. 2024
TESS Science Conference III, MIT
Contributed Talk: "Unveiling a Rare Pair of Super-Neptunes with *TESS* and *CHEOPS*" Jul. 2023
Astronomical Society of Australia Annual Science Meeting, Macquarie University
Poster: "Unveiling a rare super-Neptune and Neptune pair with *TESS* and *CHEOPS*" Feb. 2024
Extreme Solar Systems V, Christchurch, NZ

Telescope Programs

Principal Investigator 43 Orbits (72 hours)
European Space Agency CHEOPS Space Telescope

Principal Investigator 3 nights
National Science Foundation NOIRLab WIYN/NEID (3.5m)

Principal Investigator 8.7 hours
National Science Foundation NOIRLab WIYN/NEID (3.5m)

Research Experience

***TESS* Multi-Sector Planet Candidate Search** June 2022 – November 2022
Mentor: Dr. Chelsea X. Huang — *University of Southern Queensland*

- Modified MIT Quick Look Pipeline for multi-sector search through TESS Full-Frame Images
- Discovered 50 planet candidates; two confirmed resulting in first-author and co-author publications

Injection-Recovery of Planet Candidates in *TESS* March 2022 – June 2022
Mentor: Dr. Chelsea X. Huang — *University of Southern Queensland*

- Developed Python pipeline to inject and recover synthetic planets in *TESS* light curves using Box

Least Squares algorithm across various planetary orbital periods and sizes

Employment

Minerva-Australis Assistant 2022–2025

University of Southern Queensland, Mount Kent Observatory

- Maintain automated queuing system for Minerva-Australis
- Troubleshoot components of the automation system
- Add NASA/JPL targets to observation list and monitor their observations
- Manage target distribution, prioritizing Minerva science objectives and NASA targets

Research Assistant 2022–2023

Center for Astrophysics, University of Southern Queensland

- Identified planet candidates suitable for ground-based telescope observations