

# Leah Albrow

☎ +1 (617) 359-8267 | ✉ lalbrow@mit.edu | 🌐 lalbrow | 🆔 0009-0003-4251-2821

## Education

### Massachusetts Institute of Technology

Planetary Science PhD

Cambridge, Massachusetts

September 2024-Current

- First year project: continuum absorption in PDS70.
- Second year project: fluid dynamics on a lava world.

### University of Canterbury

Bachelor of Science (Honours) in Astronomy

Christchurch, New Zealand

July 2023-June 2024

- Graduated with first class honours
- Thesis: The velocity distributions of interstellar objects ejected in planetesimal scattering and dynamical instabilities

### University of Canterbury

Bachelor of Science

Christchurch, New Zealand

2020-2023

- Major subjects: physics, mathematics
- Minor subject: computer science

## Research Experience

### Calibration of the ALICE inner tracking system

CERN — Supervisors: Andrea Triolo, Dr Ivan Ravasenga

Geneva, Switzerland

Jul 2024 - Sep 2024

- CERN non-member state summer student.
- Attended lectures on a diverse range of topics relevant to high energy physics.
- Trained a neural network to improve the calibration of detectors for ALICE, a major experiment on the Large Hadron Collider, improving the particle identification capabilities for the ALPIDE chips.

### Velocity distributions of interstellar objects ejected through dynamical instabilities

University of Canterbury — Supervisor: Dr Michele Bannister

Christchurch, New Zealand

Jul 2023 - Jun 2024

- Studied various ejection mechanisms of interstellar objects (ISOs), focusing on dynamical instabilities causing significant ISO ejection.
- Used REBOUND to run 2500 n-body simulations of dynamical instabilities, across a parameter space of different mass budgets and multiplicities, receiving an A+ grade for the project.

### Separation of fusion-fission and quasi-fission using angular correlation

Australian National University — Supervisor: Dr Kaitlin Cook

Canberra, Australia

Nov 2023 - Jan 2024

- Processed data from the Heavy Ion Accelerator Facility for projectiles similar to  $^{48}\text{Ca}$ .
- Used 3D fitting methods to determine the prevalence of fusion-fission and quasi-fission reaction pathways.

### Exoplanet Watch and Eyes on Exoplanets

Jet Propulsion Laboratory — Supervisors: Dr Anjali Tripathi, Dr Rob Zelman

Pasadena, California

Apr 2023-Jul 2023

- Conducted a literature review for the stars on the Habitable Worlds Observatory preliminary target list, and synthesised this information for use in NASA's *Eyes on Exoplanets*, a publicly available tool for outreach and education.
- Enhanced the functionality and user-friendliness of EXOTIC, the transit light-curve processing software developed for the citizen science project *Exoplanet Watch*.
- Used Monte-Carlo simulations to calculate eclipse timings and uncertainties for the entire catalogue of transiting exoplanets, quantifying the ease of observation using a figure of merit.

### Mass Modelling of a Newly Discovered Galaxy Group

International Centre for Radio Astronomy Research — Supervisor: Dr Marcin Glowacki

Perth, Australia

Nov 2022-Feb 2023

- Investigated the properties of a group of 49 galaxies using radio data and multiwavelength all-sky survey observations, performing aperture photometry for all discovered galaxies.
- Generated rotation curves for the most well-resolved galaxies, and tested different dark matter distribution models.

### Hyperfine Measurements of $\text{CaF}_2$ $\text{Ho}^{3+}$ Bulk Crystals

University of Canterbury — Supervisor: Dr Mike Reid

Christchurch, New Zealand

Aug 2022-Oct 2022

- Grew  $\text{CaF}_2$   $\text{Ho}^{3+}$  crystals in the laboratory and performed infrared absorption measurements.
- Analysed the resulting spectrum, identifying hyperfine transitions from multiple symmetry centres.
- Calculated expected energy levels of hyperfine structures and compared the experimental spectrum to theory.

## Skills

<b>Programming</b>	Skilled with Python (Pandas, NumPy, scipy, scikit-learn, astropy), experience with C, ROOT, Mathematica, and R. Have experience with neural networks, clustering, and computer vision.
<b>Astronomy</b>	Used CARTA, SAOImageDS9, CASA, and Topcat. Experience with data from multiple space telescopes, and interferometric data reduction.
<b>Miscellaneous</b>	Linux, Shell (Bash), $\text{\LaTeX}$ (Overleaf/R Markdown), Git. Strong written communication and public speaking ability.

## Achievements

2024	<b>Praecis Presidential Fellowship</b> , full tuition and stipend for MIT PhD programme.	USA
2023	<b>Fulbright Science and Innovation Graduate Award (declined for visa restrictions)</b> , \$50, 000 valuation.	New Zealand
2023	<b>New Zealand Space Scholarship</b> , award facilitating internship at Jet Propulsion Laboratory.	New Zealand

## Publications

### JOURNAL ARTICLES

He Awa Whiria: The Tidal Streams of Interstellar Objects	John C. Forbes, Michele T. Bannister, Chris Lintott, Angus Forrest, Simon Portegies Zwart, Rosemary C. Dorsey, Leah Albrow, Matthew J. Hopkins
Preprint (doi: 10.48550/arXiv.2411.14577), submitted to AAS Journals. 2024	
A Serendipitous Discovery of HI-rich Galaxy Groups with MeerKAT	M. Glowacki, L. Albrow, T. Reynolds, E. Elson, E. K. Mahony, J. R. Allison
Monthly Notices of the Royal Astronomical Society. 2024	

### CONFERENCE POSTERS

Exploring the velocity distribution of interstellar objects across planetary architectures	Leah Albrow, Michele Bannister, John Forbes
AAS/Division for Extreme Solar Systems Abstracts, 2024	

## Relevant Employment

<b>University of Canterbury</b>	Christchurch, New Zealand
Teece-Townsend Telescope Operator	July 2023 - June 2024
<ul style="list-style-type: none"> <li>Operated a historic telescope for public viewing nights.</li> </ul>	
<b>University of Canterbury</b>	Christchurch, New Zealand
Astronomy Tutor and Physics Lab Demonstrator	February 2022 - June 2024
<ul style="list-style-type: none"> <li>Tutored introductory astronomy, covering basics of stellar, planetary, and galactic astronomy to first year students.</li> <li>Ran laboratory work for two introductory physics courses.</li> <li>Marked homework, lab reports, and ran drop-in help sessions when required.</li> </ul>	

## Conferences and Schools

2025	<b>Machine Learning in Planetary Dynamics Workshop</b> , hosted by the Flatiron CCA, participant.	New York, NY
2025	<b>Submillimeter Array Winter School</b> , wrote observing proposal, scheduled telescope observation, and was trained in interferometric data reduction.	Hilo, HI
2024	<b>Extreme Solar Systems V</b> , presented a poster on my progress on my honours project.	Christchurch, NZ
2023	<b>ANZCOP-AIP Summer Meeting</b> , recieved student award to attend.	Canberra, AU
2023	<b>Summer AAS Meeting</b> , assisted at the NASA exoplanet exploration booth.	Albuquerque, NM
2023	<b>RASNZ Annual Conference</b> , conference speaker	Nelson, NZ
2023	<b>New Zealand Summer School for Gravitational Waves</b> , received funding grant to attend	Auckland, NZ
2022	<b>RASNZ Annual Conference</b> , received funding grant to attend	Auckland, NZ

## Community Involvement

2024	<b>Invited talk</b> , Canterbury Astronomical Society	NZ
2023	<b>Invited talk</b> , Hamilton Astronomical Society	NZ
2023	<b>General executive</b> , UC physics society	NZ
2023	<b>Student advisory executive</b> , UC student accessibility services	NZ