

# Curriculum Vitae

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## Academic Qualifications and History:

### **2022 - Present | *Bachelor of Science* | The Australian National University**

Major in Astronomy and Astrophysics, Specialise in Advanced Physics, Minor in Mathematics

### **2022– 2022 | *Bachelor of Science* | The University of Sydney**

(Transferred to The Australian National University)

### **2022 – 2022 | *Bachelor of Science* | The University of New South Wales**

(Transferred to The University of Sydney)

### **2021 – 2022 | *Bachelor of Science (Space Science and Astrophysics)* | The University of Adelaide**

(Transferred to The University of New South Wales) Major in Space Science & Astrophysics, Minor in Mathematics

Grade Point Average (GPA): 5.667

### **2020 – 2021 | *Diploma of Engineering* | Macquarie University, Sydney NSW**

Major in Applies Physics, Minor in Mathematics

Australian Qualifications Framework (AQF): Level 5, Grade Point Average (GPA): 5.0

### **2017 – 2019 | *Higher School Certificate* | NSW Education Standards Authority**

Coursework: Physics, Chemistry, Mathematics (Adv.), English (Adv.), Software Design and Development

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## **Research Interest:      **Observational Cosmology, Multi-messenger Astronomy, & Precision Measurement****

**Astrophysics** – Supernovae, Active Galactic Nucleus, Black Hole, Dark Energy, Galaxy Formation and Evolution, Cosmology and Gravitational Wave Astronomy

**Engineering / Experimental Physics** – Space-Based Instrumentation, and Precision Measurement and Sensing

**Theoretical Physics** – Particle and Field Theory – Supersymmetry, and Standard Model and Beyond

**Mechanical Engineering** – Dynamics, and Kinematics

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## **Skills:**

**Astronomy & Astrophysics:** Python (Astropy), R, IDL, Linux System, Telescope Operations, & Science Data Reductions

**Experimental Physics & Engineering:** MATLAB, COMSOL Multiphysics, Free-Space and In Fibre Laser Optical Systems, Cryogenics Systems, Microwave Cavity, BAW Crystal, & Feedback Control Loop Systems

**Others:** Science Communications, Class 4 Laser Safety Certificate, Chemical and Radiative Substance Handling, First Aids, Clean Lab Operations, & Data Science

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## **Scholarships & Grants:**

**2023 – 2024** | The Australian Research Council Centre of Excellence for Engineered Quantum Systems (EQUS) Summer Research Scholarship – \$ 10,500.00 AUD

**2023** | The ANU Centre for Gravitational Astrophysics Winter Research Scholarship – \$ 3,000.00 AUD

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## Research Projects & Experiences:

**July 2023 – Present**

**Active Galactic Nucleus as a New Standard Candle for Cosmological Distance Measurement**

*ANU Research School of Astronomy and Astrophysics (RSAA), The Australian National University (ANU)*

Supervisor: **Dr Brad Tucker**

**June 2024 – Present**

**Selection Functions in Cosmological Surveys: Insights from 5 Years of OzDES Follow-Up Strategies for Future Surveys**

*ANU Research School of Astronomy and Astrophysics (RSAA), The Australian National University (ANU)*

Supervisor: **Prof. Christopher Lidman**

**January 2024 – Present**

**Measuring and Constraining the Finesse of an Optical Cavity**

*The ANU Centre for Gravitational Astrophysics (CGA), Research School of Astronomy and Astrophysics & Research School of Physics (RSAA & RSPHys), The Australian National University (ANU)*

Supervisors: Callum S. Sambridge, Prof. Kirk McKenzie, and **Dr Andrew Wade**

**January – February 2024**

**Modelling Acoustic Resonators to test Quantum Gravity, Dark Matter and High Frequency Gravitational Waves**

*The Australian Research Council Centre of Excellence for Engineered Quantum Systems (EQUS) & The Australian Research Council Centre of Excellence for Dark Matter Particle Physics, Quantum Technologies and Dark Matter Research Lab (QDM), School of Physics, The University of Western Australia (UWA)*

Supervisors: **Dr William Campbell**, Dr Maxim Goryachev and Prof. Michael Tobar

**July 2023 – January 2024**

**Laser Intensity Feedback Control for Improved Laser Frequency Stabilisation**

*The ANU Centre for Gravitational Astrophysics (CGA), Research School of Astronomy and Astrophysics & Research School of Physics (RSAA & RSPHys), The Australian National University (ANU)*

Supervisors: Callum S. Sambridge, Prof. Kirk McKenzie, and **Dr Andrew Wade**

**June – July 2023**

**Phase Tracking Satellites with Rapid Trajectories**

*The ANU Centre for Gravitational Astrophysics (CGA), Research School of Astronomy and Astrophysics & Research School of Physics (RSAA & RSPHys), The Australian National University (ANU)*

Supervisors: Prof. Kirk McKenzie and **Dr Andrew Wade**

**July – November 2022**

**ANU 2.3m Advanced Technology Telescope WiFeS Data Reduction**

*Honours Pathways Option for ASTR2013, Research School of Astronomy and Astrophysics (RSAA), Australian National University (ANU)*

Supervisors: **Prof. Michael Ireland** and Dr Trevor Mendel

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## Observation Experiences:

**January 2024 – Present** | *Anglo-Australian Telescope* | Observer | **Australian Astronomical Observatory, Siding Spring Observatory**

**September - November 2022** | *ANU 2.3m Telescope* | Observer | **Siding Spring Observatory**

## Observation Proposal:

**Semester 2025A** | *R/2025A/04* | Resolving the chemical fingerprints of Milky Way mergers | *Anglo-Australian Telescope* | Investigator / Observer | **Australian Astronomical Observatory, Siding Spring Observatory**

**Semester 2024B** | *A/2024B/12* | Veloce Luminosa: A homogenous analysis of Gaia benchmark stars | *Anglo-Australian Telescope* | Investigator / Observer | **Australian Astronomical Observatory, Siding Spring Observatory**

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## Scientific & Teaching Experiences:

**July 2024 – Present** | *Mentor and Supervisor* | **ACT Education Science Mentor Program**

**June 2024 – Present** | *President & Chief Astronomer* | **ANU Astronomy Society**

**March 2022 – Present** | *Astronomer & Outreach Assistant* | **Mount Stromlo Observatory, Research School of Astronomy and Astrophysics, The Australian National University**

**February – June 2024** | *Course Representative* | **ASTR3013 Astrophysical Processes** | **ANU**

**June 2022 – June 2024** | *Student Mentor for Set4ANU* | **The Australian National University**

**February – June 2023** | *Course Representative* | **PHYS2020 Thermal and Statistical Physics** | **ANU**

**Students Supervised:**

**July – December 2024** | Stanley Notari | Investigating the Hubble Tension: A Comprehensive Analysis of Early and Late Universe Measurements of the Hubble Constant

**December 2023** | Hunter | Year 10 Work Experiences Student – NSW Education | **Mount Stromlo Observatory**

**December 2023** | Blake | Year 10 Work Experiences Student – NSW Education | **Mount Stromlo Observatory**

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**Conferences, Seminars, and Summits**

**2022 – Present** | *Mount Stromlo Observatory Public Night* | **Presenter**

- The Universe and Us
- The Dark Side of Our Universe: How Does It Affect Our Understanding of the Cosmos?
- From Big Bang to Today: The Role of Gravitational Waves in Cosmic Evolution
- Unveiling the Mysteries of the Expanding Universe: From Dark Energy to Gravitational Waves

**December 2024** | *Royal Astronomical Society of Canada, Kingston, Ontario, Canada* | **Invited Guest Speaker**

- The Dark Side of the Universe: Unveiling Cosmic Mysteries with AGNs and Gravitational Waves

**December 2024** | *Royal Astronomical Society of Canada, Vancouver, British Columbia, Canada* | **Invited Guest Speaker**

- The Dark Side of the Universe: Unveiling Cosmic Mysteries with AGNs and Gravitational Waves

**October 2024** | *StarFest 2024, Siding Spring Observatory* | **Presenter & Guest Speaker**

- The Expanding Universe: Unveiling the Mysteries of Dark Matter and Dark Energy

**September 2024** | *Allan I. Carswell Astronomical Observatory, York University, Canada* | **Invited Guest Speaker**

- The Dark Side of the Universe: Unveiling Cosmic Mysteries with AGNs and Gravitational Waves

**September 2024** | *ANU Astronomy Society: 2024 Astrophysics Symposium* | **Invited Guest Speaker**

- The Dark Side of the Universe: Unveiling Cosmic Mysteries with AGNs and Gravitational Waves

**September 2024** | *Astronomical Society of New South Wales* | **Invited Guest Speaker**

- Can Active Galactic Nuclei Be Used as Standard Candles to Measure Cosmology?

**August 2024** | *Three Minute Thesis (ANU)* | **Presenter**

- Beyond the Light: Unveiling the Cosmos through Multi-messenger Astronomy

**March 2024** | *ANU Physics Society & ANU Astronomy Society* | ANU | **Presenter**

- The Cosmic Tangle: From Active Galactic Nuclei to Gravitational Waves

**March 2024** | *Perth Observatory* | **Invited Guest Speaker**

- Unlocking Universe's Secrets: From Active Galactic Nuclei to Gravitational Waves

**February 2024** | *QDM Lab – ARC COE EQUUS Summer Research Scholarship* | UWA | **Presenter**

- Modelling Acoustic Resonators to test Quantum Gravity, Dark Matter and High Frequency Gravitational Waves

**December 2023** | *2023 AIP – ANZCOP Summer Meeting* / Australian Institute of Physics | **Participant**

**December 2023** | *WST Science and Technical Meeting* / Macquarie University & ANU | **Participant**

**November 2023** | *2023 Mount Stromlo Student Seminars* | ANU | **Presenter**

- Universe's Tape Measure: From Galactic Glowsticks to Wobbly Laser Light Shows

**September 2023** | *2023 Australian Crisis Simulation Summit* | **Presenter & Invited Guest Speaker**

- The Cosmic Laboratory: Unravelling Mysteries of the Universe & Their Earthly Implications
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## **Professional Affiliations & Membership**

**2023 – Member** – Cosmology Science Team, Wide-Field Spectroscopic Telescope (WST)

**2023 – Summer Student** – The Australian Research Council Centre of Excellence for Engineered Quantum Systems (EQUS)

**2023 – Student** – Quantum Technologies and Dark Matter Research Lab (QDM), The University of Western Australia (UWA)

**2022 – Student** – Space Technology Group, ANU Centre for Gravitational Astrophysics (CGA), The Australian National University (ANU)

**2022 – Student** – Mount Stromlo Observatory, Research School of Astronomy & Astrophysics, The Australian National University (ANU)

**2021 – Student Associate** – Australian Institute of Physics (AIP)

**2020 – Student Member (StudIEAust)** – Engineers Australia (IEAust)

**2018 – Undergraduate Student Affiliate** – Canadian Association of Physicists (CAP)

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## **Publications:**

*Chan, A. (ANU), Tucker, B. (ANU), in preparation, Active Galactic Nucleus as a New Standard Candle for Cosmological Distance Measurement*

*Chan, A. (ANU), Campbell, W. (UWA), Tobar, M. (UWA), in preparation, Modelling Acoustic Resonators to test Quantum Gravity, Dark Matter and High Frequency Gravitational Waves with TeO2 BAW Crystal*

*Notari, S. , Chan, A.(ANU), in preparation, Investigating the Hubble Tension: A Comprehensive Analysis of Early and Late Universe Measurements of the Hubble Constant*

*Lidman, C. (ANU), Ross, J. (ANU), Savill-Brown, I. (ANU), Grant, A. (ANU), Chan, A. (ANU), Abbot, H. (ANU), Armstrong, P. (ANU), Brout, D. (U Penn), Taylor, G. (ANU) and Tucker, B. (ANU), 2022. **DEbass Transient Classification Report for 2022-09-13.** NASA/ADS.*

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