Patrick Armstrong

omegalambda.au | patrick.armstrong@anu.edu.au | OmegaLambda1998 | 0000-0003-1997-3649

Education

Doctor of Philosophy (Astronomy & Astrophysics) — Australian National University
February 2020 – Present

Bachelor of Science (Adv.) (Hon.) — Australian National University
February 2016 – October 2019

Experience

DES Builder — Dark Energy Survey
July 2023 – Present

- Develop & maintain the Pippin pipeline
- Internal review of DES papers
- Organise & host meetings

MSATT Student Mentor — MSATT
February 2020 – Present

- Provide guidance and mentorship for highschool students completing astronomical projects

Astronomical Tutor — Australian National University
July 2019 – October 2022

- Sole tutor for *Galaxies and Cosmology (ASTR3002)*

Student Seminar Planning Committee Member — Australian National University
February 2021 – October 2022

- [2022]: Senior planning committee member
- [2021]: Planning committee member

Mt. Stromlo Outreach Officer — Australian National University
January 2018 – December 2022

- Deliver high quality outreach experience for school groups and families

Astronomical Consultant
October 2018 – December 2020

- [2020] Research for Questacon's *Australia in Space* exhibition
- [2019] Research for Penguin Random House's *Stargazer* publication
- [2018] Research and preparation for ABC's Stargazing Live 2018
- [2018] Building backend code and moderation for the Skymapper Citizen Science Project: Supernova Sighting

Questacon Staff — Questacon
January 2015 – December 2020

- [2019 – 2020] Learning Programs Presenter (APS 4)
- [2016 – 2019] Questacon Assistant (APS 2)
- [2015 – 2019] Gallery Assistant (APS 1)

Awards & Scholarships

Alex Rodgers Travelling Scholarship — ANU College of Science
2022
- Travel to DES Collaboration Meeting 2022

Commendation for Excellence in Tutoring or Demonstrating — ANU College of Science
2022
- Tutoring *Galaxies and Cosmology (ASTR3002)*

Australian Government Research Training Program — Australian National University
2020 – Present
- PhD Scholarship

RSAA Supplementary Scholarship — Australian National University
2020 – Present
- PhD Scholarship

ANU Science, Health, and Medicine Honours Scholarship — Australian National University
2019
- Honours Scholarship

ANU Summer Research Scholarship — Australian National University
2016
- Develop a TNS Bulk Report API for the SkyMapper Transient Survey

Boyapti Computer Science and Mathematics prize for first year — Australian National University
2016
- Top grades in mathematics and computing

Conference

CosmoPalooza — Invited Speaker
2023 — *DES SN 5 Year Methodology & Results*

DES Collaboration Meeting — Invited Speaker
2020, 2021, 2022, 2023 — *DES 5 year supernova analysis*

ASA Annual Science Meeting — Speaker
2020, 2021, 2022, 2023 — *DES 5 year supernova analysis*

Kepler K2 Extragalactic Data Analysis Meeting — Attendee
2018 — *Investigating transients in Kepler's K2 survey*

Communcation

SN2017jgh: a high-cadence complete shock cooling light curve of a SN IIb with the Kepler telescope
2021

Over 180 items in print, radio, and online, across Australia and internationally

- **Highlights:**
- Al Jazeera
- National Geographic Indonesia
- Radio Canada
- De Morgen
- ABC Science online
- The Guardian
- Space Australia
- Sky News Australia
- 2GB and on the AAP wires

Publications

First Author

Probing the consistency of cosmological contours for supernova cosmology
P. Armstrong, H. Qu, et. al. (2023)
Publications of the Astronomical Society of Australia
doi: 10.1017/pasa.2023.40

SN2017jgh: a high-cadence complete shock cooling light curve of a SN IIb with the Kepler telescope
P. Armstrong, B E. Tucker, et. al. (2022)
Monthly Notices of the Royal Astronomical Society
doi: 10.1093/mnras/stab2138

Co-Author

Binning is Sinning: Redemption for Hubble Diagram Using Photometrically Classified Type Ia Supernovae
R. Kessler, M. Vincenzi, ..., P. Armstrong, et. al. (2023)
The Astrophysical Journal Letters
doi: 10.3847/2041-8213/ace34d

Revealing the Progenitor of SN 2021zby through Analysis of the TESS Shock-cooling Light Curve
Q. Wang, P. Armstrong, et. al. (2023)
The Astrophysical Journal Letters
doi: 10.3847/2041-8213/acb0d0

Concerning colour: The effect of environment on type Ia supernova colour in the dark energy survey
L. Kelsey, M. Sullivan, ..., P. Armstrong, et. al. (2023)
Monthly Notices of the Royal Astronomical Society
doi: 10.1093/mnras/stac3711

The Dark Energy Survey supernova program: cosmological biases from supernova photometric classification
M. Vincenzi, M. Sullivan, ..., P. Armstrong, et. al. (2022)
Monthly Notices of the Royal Astronomical Society
doi: 10.1093/mnras/stac1404

Revealing the progenitor of SN 2021zby through analysis of the *TESS* shock-cooling light curve
Q. Wang, P. Armstrong, et. al. (2023)
arXiv e-prints
doi: 10.48550/arXiv.2211.03811

Measuring Cosmological Parameters with Type Ia Supernovae in redMaGiC Galaxies
R. Chen, D. Scolnic, ..., P. Armstrong, et. al. (2023)
The Astrophysical Journal
doi: 10.3847/1538-4357/ac8b82

The Pantheon+ Analysis: Cosmological Constraints
D. Brout, D. Scolnic, ..., P. Armstrong, et. al. (2023)
The Astrophysical Journal
doi: 10.3847/1538-4357/ac8e04

The dark energy survey 5-yr photometrically identified type Ia supernovae
A. Möller, M. Smith, ..., P. Armstrong, et. al. (2023)
Monthly Notices of the Royal Astronomical Society
doi: 10.1093/mnras/stac1691

SN 2018agk: A Prototypical Type Ia Supernova with a Smooth Power-law Rise in Kepler (K2)
Q. Wang, A. Rest, ..., P. Armstrong, et. al. (2022)

The Astrophysical Journal

doi: 10.3847/1538-4357/ac2c84

Rates and delay times of Type Ia supernovae in the Dark Energy Survey
P. Wiseman, M. Sullivan, ..., P. Armstrong, et. al. (2023)

Monthly Notices of the Royal Astronomical Society

doi: 10.1093/mnras/stab1943

First Results of the SkyMapper Transient Survey
A. Möller, B. E. Tucker, ..., P. Armstrong, et. al. (2022)

IAU Symposium

doi: 10.1017/S1743921318002077

Spectroscopic classification of SN 2018bwp as a type Ia supernova a few weeks after peak brightness
A. Lopez-Sanchez, L. Galbany, ..., P. Armstrong, et. al. (2022)

The Astronomer's Telegram

bibcode: 2018ATel11671....1L

Spectroscopic classification of SN 2018bwq as a type Ia supernova a few days before maximum light.
A. Lopez-Sanchez, L. Galbany, ..., P. Armstrong, et. al. (2022)

The Astronomer's Telegram

bibcode: 2018ATel11667....1L

First Confirmed Supernova with the SkyMapper/Zooniverse Supernova Sighting Project
B. E. Tucker, A. Moller, ..., P. Armstrong, et. al. (2022)

The Astronomer's Telegram

bibcode: 2017ATel10426....1T

WiFeS Classification of SMT17kdl/SN2017edm as a Type Ia Supernova
B. E. Tucker, A. Moller, ..., P. Armstrong, et. al. (2022)

The Astronomer's Telegram

bibcode: 2017ATel10444....1T

DEbass Transient Classification Report
C. Lidman, H. J. Abbot, ..., P. Armstrong, et. al.

Transient Name Server Classification Report

- 2023-01-07: bibcode: 2023TNSCR..33....1L
- 2022-10-11: bibcode: 2022TNSCR2955....1L
- 2022-09-13: bibcode: 2022TNSCR2645....1L
- 2022-09-14: bibcode: 2022TNSCR2650....1L
- 2022-09-20: bibcode: 2022TNSCR2715....1L
- 2022-08-19: bibcode: 2022TNSCR2381....1L
- 2022-08-21: bibcode: 2022TNSCR2406....1L
- 2022-07-09: bibcode: 2022TNSCR1932....1L
- 2022-07-16: bibcode: 2022TNSCR2000....1L
- 2022-07-20: bibcode: 2022TNSCR2041....1L
- 2022-06-18: bibcode: 2022TNSCR1694....1L
- 2021-12-21: bibcode: 2021TNSCR4188....1L

- 2021-11-16: bibcode: 2021TNSCR3934....1L
- 2021-11-18: bibcode: 2021TNSCR3951....1L
- 2021-10-26: bibcode: 2021TNSCR3650....1L
- 2021-10-27: bibcode: 2021TNSCR3660....1L

Transient Classification Report for 2021-10-12
C. Lidman, M. Dixon, ..., P. Armstrong, et. al. (2022)

Transient Name Server Classification Report
bibcode: 2017TNSTR.593....1M

Classification of 11 supernovae by DEBass
C. Lidman, S. Dhaka, ..., P. Armstrong, et. al. (2022)

The Astronomer's Telegram
bibcode: 2017TNSTR.593....1M

SkyMapper Transient Discovery Report

A. Moller, B. Tucker, ..., P. Armstrong, et. al.

Transient Name Server Discovery Report

- 2018-05-23: bibcode: 2018TNSTR.698....1M
- 2017-09-06: bibcode: 2017TNSTR.974....1M
- 2017-08-01: bibcode: 2017TNSTR.827....1M
- 2017-08-02: bibcode: 2017TNSTR.832....1M
- 2017-08-03: bibcode: 2017TNSTR.837....1M
- 2017-08-07: bibcode: 2017TNSTR.851....1M
- 2017-08-08: bibcode: 2017TNSTR.854....1M
- 2017-08-22: bibcode: 2017TNSTR.899....1M
- 2017-08-23: bibcode: 2017TNSTR.904....1M
- 2017-08-27: bibcode: 2017TNSTR.923....1M
- 2017-08-28: bibcode: 2017TNSTR.927....1M
- 2017-08-30: bibcode: 2017TNSTR.934....1M
- 2017-05-19: bibcode: 2017TNSTR.568....1M
- 2017-05-23: bibcode: 2017TNSTR.582....1M
- 2017-05-25: bibcode: 2017TNSTR.593....1M