# Patrick Armstrong

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## Education

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

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

## Academic Experience

**DES Builder** — Dark Energy Survey
*Develop & maintain the Pippin pipeline, Internal review of DES papers, Organise & host meetings.* *July 2023 – Present*

**MSATT Student Mentor** — MSATT
*Provide guidance and mentorship for highschool students completing astronomical projects.* *February 2020 – Present*

**Astronomical Tutor** — Australian National University
*Sole tutor for Galaxies and Cosmology (ASTR3002).* *July 2019 – October 2022*

## Other Experience

**Student Seminar Planning Committee Member** — Australian National University
*[2022]: Senior planning committee member, [2021]: Planning committee member* *February 2021 – October 2022*

**Mt. Stromlo Outreach Officer** — Australian National University
*Deliver high quality outreach experience for school groups and families* *January 2018 – December 2022*

**Astronomical Consultant**
*[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
*[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
*Travel to DES Collaboration Meeting 2022* *2022*

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

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

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

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

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

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

## 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

## Conference Talks

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

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

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

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

## Communcation

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

Over 180 items in print, radio, and online, across Australia and internationally
*2021*