

# Patrick Armstrong

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## EDUCATION

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### Doctor of Philosophy (Astronomy & Astrophysics)

*February 2020 – Present*

Australian National University

### Bachelor of Science (Adv.) (Hon.)

*February 2016 – October 2019*

Australian National University

## EXPERIENCE

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### DES Builder

*July 2023 – Present*

Dark Energy Survey

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

### MSATT Student Mentor

*February 2020 – Present*

MSATT

- Provide guidance and mentorship for highschool students completing astronomical projects

### Astronomical Tutor

*July 2019 – October 2022*

Australian National University

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

### Student Seminar Planning Committee Member

*February 2021 – October 2022*

Australian National University

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

### Mt. Stromlo Outreach Officer

*January 2018 – December 2022*

Australian National University

- 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

*January 2015 – December 2020*

Questacon

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

## AWARDS & SCHOLARSHIPS

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### 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

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### 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*

## COMMUNICATION

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

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

2021

- **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](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://ui.adsabs.org/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](https://ui.adsabs.org/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](https://ui.adsabs.org/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](https://ui.adsabs.org/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](https://ui.adsabs.org/2023TNSCR...33....1L)
- 2022-10-11: bibcode: [2022TNSCR2955....1L](https://ui.adsabs.org/2022TNSCR2955....1L)
- 2022-09-13: bibcode: [2022TNSCR2645....1L](https://ui.adsabs.org/2022TNSCR2645....1L)
- 2022-09-14: bibcode: [2022TNSCR2650....1L](https://ui.adsabs.org/2022TNSCR2650....1L)
- 2022-09-20: bibcode: [2022TNSCR2715....1L](https://ui.adsabs.org/2022TNSCR2715....1L)
- 2022-08-19: bibcode: [2022TNSCR2381....1L](https://ui.adsabs.org/2022TNSCR2381....1L)
- 2022-08-21: bibcode: [2022TNSCR2406....1L](https://ui.adsabs.org/2022TNSCR2406....1L)
- 2022-07-09: bibcode: [2022TNSCR1932....1L](https://ui.adsabs.org/2022TNSCR1932....1L)
- 2022-07-16: bibcode: [2022TNSCR2000....1L](https://ui.adsabs.org/2022TNSCR2000....1L)
- 2022-07-20: bibcode: [2022TNSCR2041....1L](https://ui.adsabs.org/2022TNSCR2041....1L)
- 2022-06-18: bibcode: [2022TNSCR1694....1L](https://ui.adsabs.org/2022TNSCR1694....1L)
- 2021-12-21: bibcode: [2021TNSCR4188....1L](https://ui.adsabs.org/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)*

## Classification of 11 supernovae by DEBass

*C. Lidman, S. Dhaka, ..., P. Armstrong,  
et. al. (2022)*

## SkyMapper Transient Discovery Report

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

- 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](#)

## Transient Name Server Classification Report

*bibcode: [2017TNSTR.593....1M](#)*

## The Astronomer's Telegram

*bibcode: [2017TNSTR.593....1M](#)*

## Transient Name Server Discovery Report