Patrick Armstrong

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Education

Australian National University — Canberra, Australia
PhD. in Astronomy & Astrophysics, Advisor: Christopher Lidman — 2020–Current

Australian National University — Canberra, Australia
BS. Adv. Hon. in Physics with Astrophysics Specialisation, GPA: 6.906/7 — 2016–2019
- Thesis: "Biases within photometrically classified supernova samples"

Experience

Questacon — Canberra, Australia
Astronomical Consultant (APS 4) — 2020

Penguin Random House — Australia
Astronomical Consoluting for *Stargazer* — 2019

Questacon — Canberra, Australia
Learning Programs Officer (APS 4) — 2019–Present

Australian National Univeristy — Canberra, Australia
Mt. Stromlo Outreach Officer — 2018–Present

Questacon — Canberra, Australia
Questacon Assistant (APS 2) — 2016–2019

Questacon — Canberra, Australia
Gallery Assistant (APS 1) — 2015–2016

Skills

- **Scientific Computing** Familiarity with many languages including Python 2 & 3 and Julia. Experience with physical modelling, data processing, statistical inference, and software development.
- **Website Design** Proficiency with HTML & CSS as well as static website implementations such as Jekyll.
- **Scientific Outreach** Years of experience communicating scientific phenomena to the general public. This includes both face to face demonstration and development of outreach programs.
- **Bayesian Inference** Lot's of experience with Bayesian Inference techniques (MCMC, ABC, etc...) gained through a number of astronomical projects.

Languages

- **Python 2 & 3:** Advanced – have worked on multiple large-scale projects.
- **Julia:** Intermediate – have worked on many solo projects.
- **HTML & CSS:** Proficient – have worked on a number of websites.

Teaching

- **Tutor** at Australian National University 2019–Present
  Galaxies and Cosmology (ASTR3002)
- **Student Mentor** with MSATT 2020–Present

Scholarships and Awards

- ANU Science, Health, and Medicine Honours Scholarship 2019
- ANU Summer Research Scholarship 2016
  - Creating a TNS Bulk Report API for the SkyMapper Transient Survey
- Boyapati Computer Science and Mathematics prize for first year 2016

Extracurricular Activities

- St. John Ambulance Australia 2014–2019
  Volunteered as a first aider both as a cadet and an adult member. Performed first aid at many local and regional events around Canberra and Queanbeyan.
- Questacon Volunteer 2014–2015
  Described scientific phenomena to the general public
- ABC/BBC Stargazing Live Citizen Science Project 2017
  Created an API for both the "Planet 9" and "Supernova Sighting" citizen science projects.
- SkyMapper Transient Survey 2016
  Revamped the Skymapper Transient Survey website.

Conferences

Attended

- Harley Wood School of Astronomy 2020
- ADACS astro-comp hack week 2020
- ANITA summer school program - "Cosmic Explosions" 2020
- K2 Extragalactic Data Analysis Meeting 2018 2018

Research

See full list of projects on omegalambda.com.au/projects

- SN2017jgh - A high-cadence complete shock cooling curve of a SN IIb with the *Kepler* telescope (2019)
- Using forward modelling to evaluate the accuracy of current systematic methods in the Dark Energy Survey
- Creating an implementation of Approximate Bayesian Computation (ABC) for supernova cosmology

Infrastructure / Data Contributions

[1] A. Möller, B. E. Tucker, **P. Armstrong**, S. .-.-W. Chang, N. Lowson, C. A. Onken, F. Panther, R. Ridden-Harper, A. J. Ruiter, R. Scalzo, B. P. Schmidt, I. R. Seitenzahl, N. E. Sommer, C. Wolf, F. Yuan, and B. Zhang, "First Results of the SkyMapper Transient Survey", in *Southern Horizons in Time-Domain Astronomy*, R. E. Griffin, Ed., ser. IAU Symposium, vol. 339, Aug. 2019, pp. 3–6.

[2] A. R. Lopez-Sanchez, L. Galbany, Y. Ascasibar, K. Fiegert, T. Barnes, C. Cunningham, T. Cristiano, S. Dean, R. Edwards, N. East, K. Franks, J. Hams, R. I. Higgins, J. Hogan, R. Last, M. Longmuir, A. McRae, N. McElhinney, R. Miller, C. Murphy, C. D. A. Quarrell, G. O'Donnell, M. Rochler, H. Roberts, L. Robinson, S. Soule, N. J. Spillman, P. Shelmerdine, R. Vassie, M. Vickers, J. A. Westwood, R. J. Smethurst, C. Lintott, A. Moller, B. Tucker, **P. Armstrong**, C. Bray, S.-W. Chang, C. Onken, R. Ridden-Harper, G. Taylor, A. Ruiter, B. Cox, and J. Zemiro, "Spectroscopic classification of SN 2018bwp as a type Ia supernova a few weeks after peak brightness", *The Astronomer's Telegram*, vol. 11671, p. 1, May 2018.

[3] A. R. Lopez-Sanchez, L. Galbany, Y. Ascasibar, K. Fiegert, L. Burchat, B. Long, H. Roberts, P. Newling, R. J. Smethurst, C. Lintott, A. Moller, B. Tucker, **P. Armstrong**, C. Bray, S.-W. Chang, C. Onken, R. Ridden-Harper, G. Taylor, A. Ruiter, B. Cox, and J. Zemiro, "Spectroscopic classification of SN 2018bwq as a type Ia supernova a few days before maximum light.", *The Astronomer's Telegram*, vol. 11667, p. 1, May 2018.

[4] A. Moller, B. Tucker, **P. Armstrong**, C. Bray, S. Chang, C. Onken, R. Ridden-harper, A. Ruiter, and G. Taylor, "SkyMapper Transient Discovery Report for 2018-05-23", *Transient Name Server Discovery Report*, vol. 2018-698, p. 1, May 2018.

[5] A. Moller, B. Tucker, B. Zhang, F. Panther, N. E. Sommers, R. Ridden-harper, and **P. Armstrong**, "SkyMapper Transient Discovery Report for 2017-05-19", *Transient Name Server Discovery Report*, vol. 2017-568, p. 1, May 2017.

[6] A. Moller, B. Tucker, B. Zhang, F. Panther, N. E. Sommers, R. Ridden-harper, and **P. Armstrong**, "SkyMapper Transient Discovery Report for 2017-05-23", *Transient Name Server Discovery Report*, vol. 2017-582, p. 1, May 2017.

[7] A. Moller, B. Tucker, B. Zhang, F. Panther, N. E. Sommers, R. Ridden-harper, and **P. Armstrong**, "SkyMapper Transient Discovery Report for 2017-05-25", *Transient Name Server Discovery Report*, vol. 2017-593, p. 1, May 2017.

[8] A. Moller, B. Tucker, B. Zhang, F. Panther, N. E. Sommers, R. Ridden-harper, and **P. Armstrong**, "SkyMapper Transient Discovery Report for 2017-08-01", *Transient Name Server Discovery Report*, vol. 2017-827, p. 1, Aug. 2017.

[9] A. Moller, B. Tucker, B. Zhang, F. Panther, N. E. Sommers, R. Ridden-harper, and **P. Armstrong**, "SkyMapper Transient Discovery Report for 2017-08-02", *Transient Name Server Discovery Report*, vol. 2017-832, p. 1, Aug. 2017.

[10] A. Moller, B. Tucker, B. Zhang, F. Panther, N. E. Sommers, R. Ridden-harper, and **P. Armstrong**, "SkyMapper Transient Discovery Report for 2017-08-03", *Transient Name Server Discovery Report*, vol. 2017-837, p. 1, Aug. 2017.

[11] A. Moller, B. Tucker, B. Zhang, F. Panther, N. E. Sommers, R. Ridden-harper, and **P. Armstrong**, "SkyMapper Transient Discovery Report for 2017-08-07", *Transient Name Server Discovery Report*, vol. 2017-851, p. 1, Aug. 2017.

[12] A. Moller, B. Tucker, B. Zhang, F. Panther, N. E. Sommers, R. Ridden-harper, and **P. Armstrong**, "SkyMapper Transient Discovery Report for 2017-08-08", *Transient Name Server Discovery Report*, vol. 2017-854, p. 1, Aug. 2017.

[13] A. Moller, B. Tucker, B. Zhang, F. Panther, N. E. Sommers, R. Ridden-harper, and **P. Armstrong**, "SkyMapper Transient Discovery Report for 2017-08-22", *Transient Name Server Discovery Report*, vol. 2017-899, p. 1, Aug. 2017.

[14] A. Moller, B. Tucker, B. Zhang, F. Panther, N. E. Sommers, R. Ridden-harper, and **P. Armstrong**, "SkyMapper Transient Discovery Report for 2017-08-23", *Transient Name Server Discovery Report*, vol. 2017-904, p. 1, Aug. 2017.

[15] A. Moller, B. Tucker, B. Zhang, F. Panther, N. E. Sommers, R. Ridden-harper, and **P. Armstrong**, "SkyMapper Transient Discovery Report for 2017-08-27", *Transient Name Server Discovery Report*, vol. 2017-923, p. 1, Aug. 2017.

[16] A. Moller, B. Tucker, B. Zhang, F. Panther, N. E. Sommers, R. Ridden-harper, and **P. Armstrong**, "SkyMapper Transient Discovery Report for 2017-08-28", *Transient Name Server Discovery Report*, vol. 2017-927, p. 1, Aug. 2017.

[17] A. Moller, B. Tucker, B. Zhang, F. Panther, N. E. Sommers, R. Ridden-harper, and **P. Armstrong**, "SkyMapper Transient Discovery Report for 2017-08-30", *Transient Name Server Discovery Report*, vol. 2017-934, p. 1, Aug. 2017.

[18] A. Moller, B. Tucker, B. Zhang, F. Panther, N. E. Sommers, R. Ridden-harper, and **P. Armstrong**, "SkyMapper Transient Discovery Report for 2017-09-06", *Transient Name Server Discovery Report*, vol. 2017-974, p. 1, Sep. 2017.

[19] B. E. Tucker, A. Moller, **P. Armstrong**, J. Mould, S. Uddin, D. Muthukrishna, F. H. Panther, A. Ruiter, R. Ridden-Harper, B. P. Schmidt, N. E. Sommer, B. Zhang, and I. Seitenzahl, "WiFeS Classification of SMT17kdl/SN2017edm as a Type Ia Supernova", *The Astronomer's Telegram*, vol. 10444, p. 1, May 2017.

[20] B. E. Tucker, A. Moller, **P. Armstrong**, J. Mould, S. Uddin, D. Muthukrishna, F. H. Panther, A. Ruiter, R. Ridden-Harper, B. P. Schmidt, N. E. Sommer, B. Zhang, I. Seitenzahl, E. Baeten, and A. Craggs, "First Confirmed Supernova with the SkyMapper/Zooniverse Supernova Sighting Project", *The Astronomer's Telegram*, vol. 10426, p. 1, May 2017.