

## Simon Murphy

Postdoctoral Research Assistant

Sydney Institute for Astronomy (SfA), University of Sydney, NSW, Australia

*email:* [murphy@physics.usyd.edu.au](mailto:murphy@physics.usyd.edu.au); *website:* [www.simonmurphy.info](http://www.simonmurphy.info)

### Education

- 2010-2013 Studied under a PhD program (award conferred 2013 Oct.), titled “Investigating the A-type stars with *Kepler* data”, with an STFC studentship. Thesis adviser: Prof. Don Kurtz. UCLan’s fastest ever Astronomy PhD via MPhil.
- 2007-2010 BSc (Hons) Physics with Astrophysics, University of Manchester, UK. Average exam grade in final year of study: 86%.

### Research Interests

I began my current, and first, postdoctoral position at USyd in 2013 Oct. Present research interests are:

- The plethora of phenomena found in A-type stars, especially chemical peculiarities and pulsation.
- Development of novel data analysis practices, such as Super-Nyquist Asteroseismology and Phase Modulation analysis (see publications).
- MK classification and characterisation of peculiar stars, particularly lambda Bootis stars.

A short (500-word) research summary is collated separately at [simonmurphy.info/research](http://simonmurphy.info/research)

### Skills and Experience

- Leading publications -- demonstrating good time- and people-management, and over-arching knowledge of disciplines in the same field.
- Expert in Fourier and time-series analysis, particularly of Kepler data.
- Competent spectral classifier, especially of B/A/F stars.
- Programmer in three main languages: Ruby, C++ and IDL.
- Actively involved in organising the Kepler Asteroseismic Science Consortium (KASC) working group on classical pulsators (formerly delta Scuti stars). Chair of the time-series analysis sub-group for classical pulsators.
- Various teaching, marking and outreach duties, including public talks and thesis examination.

### Publications and Reviewing

#### *First author, refereed publications:*

- [Finding binaries among Kepler pulsating stars from phase modulation of their pulsations:](#) Murphy et al. (2014), MNRAS, 441, 2515
- [Frequency analysis of the high-amplitude SX Phe star KIC 11754974:](#) Murphy et al. (2013b), MNRAS, 432, 2284
- [Super-Nyquist asteroseismology with the Kepler Space Telescope,](#) Murphy et al. (2013a), MNRAS, 430, 2986
- [Kepler Fourier concepts: The performance of the Kepler data pipeline,](#) Murphy (2012b), AN 333, 1057 (arXiv:1211.5141)
- [Pulsational amplitude growth of KIC 3420637 \(HD 178875\) in the context of Am and rho Puppis stars,](#) Murphy et al. (2012a), MNRAS 427, 1418
- [Characteristics of Kepler short- and long-cadence data,](#) Murphy (2012a), MNRAS 422, 665

A full list of publications, invited and contributed talks is collected separately. Publications are available for download in pdf format at [simonmurphy.info/research](http://simonmurphy.info/research)

**Reviewing:** External examiner of one thesis. Reviewer for The Astrophysical Journal (**ApJ**), Monthly Notices of the Royal Astronomical Society (**MNRAS**), Publications of the Astronomical Society of Australia (**PASA**), and the Information Bulletin of Variable Stars (**IBVS**). Former organiser of UCLan’s stellar astrophysics meetings; organiser of USyd’s Asteroseismology journal club. Co-organiser of SfA’s ‘Morning Tea’ (weekly departmental meeting).

## Fundraising and Proposals

Full or partial funding was obtained for the following meetings:

- CoRoT3-KASC7 / The Aarhus Spectroscopy Workshop (Toulouse, France, 2014 July / Aarhus, Denmark, 2014 May) externally funded for travel, subsistence and accommodation.
- KASC6 (Sydney, Australia, 2013 June) funded by RAS for GBP1250, **invited review talk**.
- Three-month research visit at University of Porto (2012 Oct-Dec) externally funded for all costs except travel.
- 10<sup>th</sup> NEON Observing School (Asiago, Italy, 2012 September) externally funded for all costs except travel.
- KASC 5 (Balaton, Hungary, 2012 June) funded for GBP200 of travel costs.
- The Modern Era of Helio- and Asteroseismology (Oberurgl, Austria, 2012 May) externally funded for all costs except travel.
- Exoplanets and their host stars (University of Oxford, 2012 March), fully funded by the STFC.
- First Kepler Science Conference (NASA Ames, California, 2011 Dec) was externally funded for USD1500.

My PhD and first post-doctoral position have predominantly used data from the Kepler Space Telescope. As such, few proposals have been required for ground-based data acquisition. I have been awarded telescope time for thirteen full nights on the ANU 2.3-m telescope at Siding Spring, fast-track time on the 2.5-m Nordic Optical Telescope, and five half-nights on the 1.5-m Loiano Telescope. I also observe regularly (up to twice weekly) on the 32-inch telescope at Dark Sky Observatory, remotely.

## Teaching

- Auxiliary supervisor for one PhD student, two third-year and two first-year (semester-long) research projects.
- One lab and one tutorial group for first/second-year astronomy at USyd (voluntary teaching).
- Demonstrated astronomy lab for first year undergraduates at UCLan's Alston observatory, 2011-2012 academic year.
- Demonstrated C++ lab for second-year undergraduates.
- Edited course notes for second-year solar system physics course.
- Marked a variety of UCLan's distance-learning undergraduate-level modules.
- During undergraduate and early post-graduate career, delivered gym instructor and personal trainer courses to groups of 6-12 adults over two weekends, constituting 14-18 hours of teaching and assessment per weekend; acted as a support tutor for up to 20 adults over 6-8 week periods.

## Outreach

- "Visiting Astronomer" for 4x 1 hr talks at Bourne Grammar School, UK, July 2014.
- Public talk "Planets and Pulsations" for the Society for Popular Astronomy, 2013 May.

Represented UCLan at:

- Astrofest, Feb 2012 (and 2013),
- Lancashire Science Festival, 2012, on behalf of the Institute of Physics
- Part of UCLan's graduate outreach programme as a STEMNET ambassador.

## Prizes and Awards

- **PhD thesis to be published by Springer in their "best of the best" theses series.**
- Runner up prize in "Experienced Presenter" category for oral presentation at UCLan's graduate research conference, 2012.
- Winner of "Best Poster" category at UCLan's graduate research conference, 2011.
- Selina Bright scholarship (best exam results), University of Manchester 2010

## Other

***Citizenship:*** British citizen

***Spoken languages:*** English mother-tongue; Advanced German

***Computer languages:*** Ruby; C/C++; IDL

***Driving:*** Full, clean UK driving licence

***Societies:*** FRAS

## References

Prof. Don Kurtz, Jeremiah Horrocks Institute, University of Central Lancashire, Preston PR1 2HE, UK. Email: kurtzdw@gmail.com

Prof. Hiromoto Shibahashi, Department of Astronomy, The University of Tokyo, Tokyo 113-0033, Japan. Email: h.shibahashi@gmail.com

Prof. Richard Gray, Department of Physics and Astronomy, Appalachian State University, Boone, NC 26808, USA. Email: grayro@appstate.edu

Prof. Timothy Bedding, Sydney Institute for Astronomy (SfA), School of Physics, University of Sydney, Australia. Email: bedding@physics.usyd.edu.au