Simon J. Murphy

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Education

2010-2013 PhD "Investigating the A-type stars with *Kepler* data", with an STFC studentship. University of Central Lancashire (UCLan) 2013. 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%.

Current Position

2013-present Postdoctoral Researcher
Sydney Institute for Astronomy (SIfA), University of Sydney, NSW, Australia

H-index (end-Apr 2015): 7 **For first-author publications**: 5 **Per year since first publication**: 1.75

Research Interests

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

- A-type stars, especially chemical peculiarities and pulsation.
- Developing 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

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, supervision and outreach duties, including public talks and thesis examination.

Publications and Reviewing

First author, refereed publications:

- An evaluation of the membership probability of 212 lambda Boo stars: I. A Catalogue: Murphy et al. (2015b), MNRAS (accepted), arxiv:1508.03633
- The potential for super-Nyquist asteroseismology with TESS: Murphy (2015), MNRAS (accepted), arxiv:1508.02717
- Deriving the orbital properties of pulsators in binary systems through their light arrival time delays: Murphy & Shibahashi (2015), MNRAS, 450, 4475
- A search for non-pulsating, chemically normal stars in the delta Scuti instability strip using Kepler data: Murphy et al. (2015a), MNRAS 447, 3948
- Investigating the A-type stars using Kepler data: Murphy (2014), PhDT, Springer, ISBN 978-3-319-09417-5
- 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

Reviewing:
External examiner of one thesis.
The Astrophysical Journal (**ApJ**)
Monthly Notices of the Royal Astronomical Society (**MNRAS**)
Publications of the Astronomical Society of Australia (**PASA**)
Information Bulletin of Variable Stars (**IBVS**)

Departmental responsibilities:
Co-organiser of SIfA's 'Morning Tea' (weekly departmental meeting).
Organiser of USyd's Asteroseismology journal club.
Former organiser of UCLan's stellar astrophysics meetings

Fundraising and Proposals
Full or partial funding was obtained for the following meetings:
- KASC 8 (Aarhus, Denmark, 2015 June). I**nvited review talk**. All travel, accommodation and subsistence externally funded.
- Pulsating stars workshop and seminar (University of Tokyo, Tokyo, Japan, 2015 Jan). Externally funded for local costs (162,000 Yen).
- 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.
- 10th NEON Observing School (Asiago, Italy, 2012 September) externally funded for all costs except travel.
- KASC 5 (Balaton, Hungary, 2012 June) funded for GBP 200 of travel costs.
- The Modern Era of Helio- and Asteroseismology (Obergurgl, 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 USD 1500.

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. Nonetheless, I have been awarded telescope time for 17 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 up to twice weekly on the 32-inch telescope at Dark Sky Observatory, remotely.

Teaching
- Auxiliary supervisor for one PhD student; supervisor of several undergraduate research projects.
- One lab and one tutorial group for first/second-year astronomy at USyd (voluntary teaching).

- Guest lecturer for Senior (3rd-yr undergraduate) Astrophysics, USyd.
- Talented Student Programme Showcase lecturer, USyd.
- 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

- Assisting with amateur astronomy research projects, and an astronomy-related art project.
- "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 selected by Springer for publication in their "best of the best" theses series** (ISBN 978-3-319-09417-5)
- 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

Name	Address	Email
Prof. Timothy Bedding	Sydney Institute for Astronomy (SIfA), School of Physics, University of Sydney, Australia.	bedding@physics.usyd.edu.au
Prof. Don Kurtz	Jeremiah Horrocks Institute, University of Central Lancashire, Preston PR1 2HE, UK.	kurtzdw@gmail.com
Prof. Hiromoto Shibahashi	Department of Astronomy, The University of Tokyo, Tokyo 113-0033, Japan.	h.shibahashi@gmail.com
Prof. Richard Gray	Department of Physics and Astronomy, Appalachian State University, Boone, NC 26808, USA.	grayro@appstate.edu