Simon Murphy

Postdoctoral Research Assistant

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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, postdoctal 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

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), arXiv:1404.5649
- 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. 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 (journal club).

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 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 GBP200 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 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 three 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.

Teaching

- Auxiliary supervisor for one PhD student and one third-year (semester-long) research project.
- One lab and one tutorial group for first/second-year astronomy at 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

- 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

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