

Simon J. Murphy

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Current Position

2013-present Postdoctoral Researcher in Asteroseismology
Sydney Institute for Astronomy (SfA), University of Sydney, NSW 2006, Australia

Education

2010-2013 PhD “[Investigating the A-type stars with *Kepler* data](#)”, Univ. Central Lancashire, UK.
2007-2010 1st class BSc (Hons) Physics with Astrophysics, University of Manchester, UK.

Prizes and Awards

2015 JSPS Overseas Researcher Fellowship, University of Tokyo (to run Jan-Apr 2016)
2014 **PhD thesis selected by Springer for publication in their “best of the best” theses series**
2012 Prize in “Experienced Presenter” category for oral presentation at UCLan’s graduate research conference.
2011 Competitive research fellowship, Centro de Astrofísica da Universidade do Porto, University of Porto, Oct-Dec 2011
2011 Winner of “Best Poster” category at UCLan’s graduate research conference.
2010 STFC studentship for PhD, valued at GBP ~13,500 per annum.
2010 Selina Bright scholarship, University of Manchester.

First-author refereed publications

11. [An evaluation of the membership probability of 212 lambda Boo stars: I. A Catalogue](#)
S. J. Murphy, C. J. Corbally, R. O. Gray, K. P. Cheng, J. Neff, et al. (2015), PASA, 32, 36
10. [The potential for super-Nyquist asteroseismology with TESS](#)
S. J. Murphy (2015), MNRAS 453, 2569
9. [Deriving the orbital properties of pulsators in binary systems through their light arrival time delays](#)
S. J. Murphy & H. Shibahashi (2015), MNRAS, 450, 4475
8. [A search for non-pulsating, chemically normal stars in the \$\delta\$ Scuti instability strip using Kepler data](#)
S. J. Murphy, T. R. Bedding, E. Niemczura, D. W. Kurtz & B. Smalley (2015), MNRAS 447, 3948
7. [Investigating the A-type stars using Kepler data \(Book, selected by Springer for publication\)](#)
S. J. Murphy (2014), PhD, Springer, ISBN 978-3-319-09417-5
6. [Finding binaries among Kepler pulsating stars from phase modulation of their pulsations](#)
S. J. Murphy, T. R. Bedding, H. Shibahashi, D. Kurtz & H. Kjeldsen (2014), MNRAS, 441, 2515
5. [Asteroseismology of KIC11754974: a high-amplitude SX-Phe pulsators in a 343-d binary system](#)
S. J. Murphy, A. Pigulski, D. W. Kurtz, J. C. Suárez, G. Handler, et al. (2013), MNRAS, 432, 2284
4. [Super-Nyquist asteroseismology with the Kepler Space Telescope](#)
S. J. Murphy, H. Shibahashi & D. W. Kurtz (2013), MNRAS, 430, 2986
3. [Kepler Fourier concepts: The performance of the Kepler data pipeline](#)
S. J. Murphy (2012), AN 333, 1057
2. [Pulsational amplitude growth of KIC 3420637 \(HD 178875\) in the context of Am and \$\rho\$ Puppis stars](#)
S. J. Murphy, A. Grigahcène, E. Niemczura, D. W. Kurtz, et al. (2012), MNRAS 427, 1418
1. [An examination of some characteristics of Kepler short- and long-cadence data](#)
S. J. Murphy (2012), MNRAS 422, 665

Co-authored Publications

14. [Photometry of very bright stars with Kepler and K2 smear data](#)
B. J. S. Pope, T. R. White, D. Huber, **S. J. Murphy**, T. R. Bedding, D. A. Caldwell, A. Sarai, S. Aigrain, T. Barclay (2016), MNRAS Letters, 455, 36
13. [Échelle diagrams and period spacings of g modes in \$\gamma\$ Doradus stars from four years of Kepler observations](#)
T. R. Bedding, **S. J. Murphy**, I. L. Colman, D. W. Kurtz (2015), EPJWC, 101, 01005
12. [KIC10080943: A binary star with two gamma Doradus / delta Scuti hybrid pulsators. Analysis of the g modes](#)
M. A. Keen, T. R. Bedding, **S. J. Murphy***, V. S. Schmid, C. Aerts, A. Tkachenko, R.-M. Ouazzani, D.W. Kurtz (2015), MNRAS, 444, 1792
* first author was my student
11. [KIC10080943: An eccentric binary system containing two pressure and gravity mode hybrid pulsators](#)
V. S. Schmid, A. Tkachenko, C. Aerts, P. Degroote, S. Bloemen, **S. J. Murphy**, T. Van Reeth, P. I. Pápics, T. R. Bedding, M. A. Keen, A. Prša, J. Menu, J. Debosscher, M. Hrudková, K. De Smedt, R. Lombaert, and P. Németh (2015), A&A, 584, 35
10. [KIC 4768731: a bright long-period roAp star in the Kepler field](#)
B. Smalley, E. Niemczura, **S. J. Murphy**, H. Lehmann, D.W. Kurtz, D.L. Holdsworth, M.S. Cunha, L.A. Balona, M. Briquet, H. Bruntt, P. de Cat, P. Lampens, A.O. Thygesen, K. Uytterhoeven (2015), MNRAS, 452, 3334
9. [FM stars II: a Fourier view of pulsating binary stars -- determining binary orbital parameters photometrically for highly eccentric cases](#)
H. Shibahashi, D. W. Kurtz, **S. J. Murphy** (2015), MNRAS, 450, 3999
8. [A unifying explanation of complex frequency spectra of gamma Dor, SPB and Be stars: combination frequencies and highly non-sinusoidal light curves](#)
D W. Kurtz, H. Shibahashi, **S. J. Murphy**, T. R. Bedding, D. M. Bowman (2015), MNRAS, 450, 3015
7. [Spectroscopic survey of Kepler stars. I. HERMES/Mercator observations of A- and F-type stars](#),
E. Niemczura, **S. J. Murphy**, B. Smalley, K. Uytterhoeven, A. Pigulski, H. Lehmann, D. M. Bowman, G. Catanzaro, E. van Aarle, S. Bloemen, M. Briquet, P. De Cat, D. Drobek, L. Eyer, J. F. S. Gameiro, N. Gorlova, K. Kaminski, P. Lampens, P. Marcos-Arenal, P. I. Papics, B. Vandenbussche, H. Van Winckel, M. Steslicki, M. Fagas (2015), MNRAS 450, 2764
6. [Asteroseismic measurement of slow, nearly uniform surface-to-core rotation in the main-sequence F star KIC 9244992](#), H. Saio, D.W. Kurtz, M. Takata, H. Shibahashi, **S. J. Murphy**, T. Sekii, T.R. Bedding (2015), MNRAS 447, 3264
5. [Validation of the frequency modulation technique applied to the pulsating delta Scuti – gamma Doradus eclipsing binary star KIC 8569819](#), D.W. Kurtz, K.M. Hambleton, H. Shibahashi, **S. J. Murphy**, A. Prsa (2015), MNRAS 446, 1223
4. [The role of turbulent pressure as a coherent pulsational driving mechanism: the case of the delta Scuti star HD187547](#), V. Antoci, M. Cunha, G. Houdek, H. Kjeldsen, R. Trampedach, G. Handler, T. Lüftinger, T. Arentoft, **S. Murphy** (2014), ApJ 796, 118
3. [Asteroseismic measurement of surface-to-core rotation in a main sequence A star, KIC11145123](#)
D.W. Kurtz, H. Saio, M. Takata, H. Shibahashi, **S.J. Murphy**, T. Sekii (2014), MNRAS 444, 102
2. [Unusual high-frequency oscillations in the Kepler delta Scuti star KIC 4840675](#)
L. A. Balona, M. Breger, G. Catanzaro, M. S. Cunha, G. Handler, Z. Kołaczowski, D. W. Kurtz, **S. J. Murphy**, E. Niemczura, M. Paparo, B. Smalley, R. Szabo', K. Uytterhoeven, J. L. Christiansen, K. Uddin and M. C. Stumpe, (2012), MNRAS 424, 1187
1. [The Kepler characterization of the variability among A- and F-type stars. I. General overview](#)
K. Uytterhoeven, A. Moya, A. Grigahcène, J. A. Guzik, J. Gutiérrez-Soto, B. Smalley, G. Handler, L. A. Balona, E. Niemczura, L. Fox Machado, S. Benatti, E. Chapellier, A. Tkachenko, R. Szabó, J. C. Suárez, V. Ripepi, J. Pascual, P. Mathias, S. Martín-Ruiz, H. Lehmann, J. Jackiewicz, S. Hekker, M. Gruberbauer, R. A. García, X. Dumusque, D. Díaz-Fraile, P. Bradley, V. Antoci, M. Roth, B. Leroy, **S. J. Murphy**, P. De Cat, J. Cuypers, H. Kjeldsen, J. Christensen-Dalsgaard, M. Breger, A. Pigulski, L. L. Kiss, M. Still, S. E. Thompson, and J. Van Cleve (2011), A&A 534, 125

Invited talks

- 2015 **Invited review talk**, “[12 Months of Rapid Advances in our Knowledge of Main-Sequence A and F Stars](#),” KASC 8, Aarhus, Denmark. June 15th.
- 2015 Seminar, “[Finding Binaries Among Pulsating Stars](#),” University of Tokyo, Tokyo, Japan. January 20th.
- 2014 Seminar, “[Finding Binaries Among Pulsating Stars](#),” Keele University, Keele, UK. June 13th.
- 2014 Seminar, “[Finding Binaries Among Pulsating Stars](#),” University of Central Lancashire, Preston, UK. June 11th.
- 2014 Seminar, “[Finding Binaries Among Pulsating Stars](#),” Aarhus University, Aarhus, Denmark. May 14th.
- 2014 Seminar, “[Beyond Transits \(the cool stuff you can do with Kepler data\)](#),” Australia National University, Canberra, Australia. March 19th.
- 2013 **Invited review talk**, “[Main sequence A-F pulsators](#),” KASC6, Sydney, Australia. June 27th.
- 2013 Seminar, “[Investigating the Intriguing A-type stars](#),” Polish Academy of Sciences, Warsaw, Poland. April 17th.
- 2013 Seminar, “[Investigating the Intriguing A-type stars](#),” University of Wroclaw, Wroclaw, Poland. April 15th.
- 2013 Seminar, “[Investigating the Intriguing A-type stars](#),” University of Birmingham, Birmingham, UK. February 6th.
- 2012 Seminar, “[Pulsating A-type stars seen with Kepler](#),” University of Porto, Porto, Portugal.

Additional conference participation

- 2015 Poster, “[Super-Nyquist Asteroseismology with TESS](#),” K2 Science Conference, Santa Barbara, USA, 2-5 November 2015
- 2014 Conference talk, “[Finding Binaries Among Pulsating Stars](#),” CoRoT3-KASC7, Toulouse, France. 7-11 July 2014. Date of talk: July 10th.
- 2014 Aarhus Spectroscopy Workshop, Aarhus, Denmark, 19-23 May 2014.
- 2014 SkyMapper Workshop, Australia National University, Canberra, Australia, 7-9 April 2014.
- 2012 10th NEON Observing School, Asiago, Italy. 10-21 September 2012.
- 2012 Prize-winning talk, “[Highlights of research with the Kepler space telescope](#),” UCLan graduate research conference 2012, Preston, UK. 3-5 July 2015. Date of talk: July 5th.
- 2012 Conference talk, “[KIC 3429637 and the problem of pulsating Am stars](#),” KASC 5, Balaton, Hungary. 18-22 June 2012. Date of talk: June 21st.
- 2012 Conference talk, “[Kepler Fourier Concepts](#),” The Modern Era of Helio- and Asteroseismology, Obergurgl, Austria. 21-25 May 2012. Date of talk: May 24th.
- 2012 Poster, “[Are the constant stars in the delta Scuti instability strip chemically peculiar?](#),” National Astronomy Meeting, Manchester, UK. 27-30 March 2012.
- 2012 Conference talk, “[Kepler Fourier concepts](#),” Exoplanets and their host stars, Oxford, UK. 12-16 March 2012. Additional solo oral presentation of group work: “[Stellar population synthesis](#),” Date of talk: March 16th.
- 2011 Poster, “[Are the constant stars in the delta Scuti instability strip chemically peculiar?](#)” First Kepler Science Conference, NASA Ames, California, USA. 5-9 December 2011.
- 2011 Conference talk “[A highly non-linear delta Scuti star](#),” KASC 4, Boulder, Colorado, USA. 11-15 July 2015. Date of talk: July 14th.
- 2011 Prize-winning poster, “[A highly non-linear delta Scuti star](#),” UCLan graduate research conference 2011, Preston, UK. May 2011.
- 2010 XXII IAC Winter School Asteroseismology, Tenerife, Spain. 15-26 Nov 2010.

Reviewing

Invited external thesis examiner.

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 and wider responsibilities

2015-present Co-organiser and chair of SIfA's 'Morning Tea' (weekly departmental meeting).

2013-present 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.

2013 Organiser of UCLan's stellar astrophysics meetings

Fundraising and Proposals (see also conference participation)

Full or partial funding was obtained for the following meetings:

2015 KASC8, Denmark; all travel and accommodation externally funded.

2015 Pulsating stars workshop and seminar, Japan; externally funded for local costs (Yen 162,000).

2014 CoRoT3-KASC7, France, and The Aarhus Spectroscopy Workshop, Denmark; externally funded for travel, subsistence and accommodation.

2013 KASC6, Australia; awarded an RAS travel grant (GBP 1250).

2012 10th NEON Observing School, Italy; externally funded for all costs except travel.

2012 KASC 5, Hungary; funded for GBP 200 of travel costs.

2012 The Modern Era of Helio- and Asteroseismology, Austria; externally funded for all costs except travel.

2012 Exoplanets and their Host Stars, UK; fully funded by the STFC.

2011 First Kepler Science Conference, USA; externally funded for USD 1500.

Observing

I use public data from the Kepler Space Telescope. In addition, I have also been awarded

- 17 nights on the ANU 2.3-m telescope at Siding Spring;
- 4 nights on the CHARA array;
- fast-track time on the 2.5-m Nordic Optical Telescope;
- five half-nights on the 1.5-m Loiano Telescope; and
- up to twice weekly remote observing on the 32-inch telescope at Dark Sky Observatory.

Teaching

2013-present Auxiliary supervisor for one PhD student; supervisor of several undergraduate research projects.

2013-present One lab and one tutorial group for first/second-year astronomy at USyd (voluntary teaching).

2015	Guest lecturer for Senior (3 rd -yr undergraduate) Astrophysics, and for the Talented Student Programme, USyd.
2011-2012	Demonstrated astronomy lab for first year undergraduates at UCLan's Alston observatory.
2011-2012	Demonstrated C++ lab for second-year undergraduates.
2010-2012	Assessed a variety of UCLan's distance-learning undergraduate-level modules.
2010	Edited course notes for second-year solar system physics course.
2009	Three-week secondary school teaching placement, University of Manchester Student Associates Scheme.

Outreach

2015	Assisting with amateur astronomy research projects and an astronomy-related PhD art project.
2014	“Visiting Astronomer” for 4x 1 hr talks at Bourne Grammar School, UK, July 3 rd .
2013	Public talk, “ Planets and Pulsations ,” Society for Popular Astronomy, 60 th Anniversary Meeting, Preston, UK. May 11 th .
2012-3	Astrofest, London. 10-12 February 2012 and 8-10 February 2013.
2012	Lancashire Science Festival, behalf of the Institute of Physics. 30 June 2015.
2012-3	Part of UCLan’s graduate outreach programme as a STEMNET ambassador.

Particular skills and experience

- Expert in Fourier and time-series analysis, particularly of Kepler data.
- Expert spectral classifier, especially of B/A/F stars.
- Programmer in three main languages: Ruby, C++ and IDL.

Other

Citizenship: British citizen

Spoken languages: English mother-tongue; Advanced German

Societies: Fellow of the Royal Astronomical Society

References

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