James S. **Kuszlewicz**

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Positions

SAGE, Max-Planck Institute for Solar System Research — *Göttingen, Germany*

Postdoctoral Researcher — *2017 - Present*

My research focusses on classifying the evolutionary state of red giant stars observed with *Kepler* using both probabilistic methods and machine learning approaches. The aim is to generalise this approach to red giants observed with K2, CoRoT and, in the future, TESS.

Education

HiROS, School of Physics and Astronomy, University of Birmingham — *Birmingham, United Kingdom*

PhD in Astrophysics — *2013 - 2017*

"Buoyancy-driven Oscillations in Helio- and Asteroseismology". My main area of research lay in the analysis of both solar data and *Kepler* red giant stars through the use of probabilistic methods. In addition I also looked at applying supervised machine learning techniques to data on large numbers of stars to help investigate properties of stellar populations.

Physics Department, University of Warwick — *Coventry, United Kingdom*

MPhys in Physics (First Class Honours) — *2009 - 2013*

Modules studied included: Quantum Physics of Atoms, Plasma Electrodynamics, Nuclear and Particle Physics, Astrophysics, Scattering and Spectroscopy.

Skills

Programming Python (daily driver), IDL, LaTeX, R (basic), C/C++ (basic)

Languages English (mother tongue), German (basic)

Experience

University of Birmingham — *Birmingham, United Kingdom*

Undergraduate 1st Year Laboratory Demonstrator — *2013 -2017*

Worked as a demonstrator in Year 1 Physics laboratory and Year 1 Astrophysics laboratory. This consisted of looking after a group of 6-10 students each week and ensuring they understood and could perform the experiment, as well as marking their laboratory reports and projects.

University of Warwick — *Coventry, United Kingdom*

Summer Student — *Jul. 2012 - Sept. 2012*

URSS project scheme. Worked under the supervision of Dr Michal Kreps using data from the LHCb experiment at CERN to search for rare particle decays.

CGG Veritas — *Crawley, United Kingdom*

Summer Intern — *Jan. 2013 - Feb. 2013*

Worked as part of a team given the task of processing seismic data, as well as given the opportunity to use initiative in order to solve any problems that arose in the data. The processing required knowledge of UNIX and UNIX-based programs in order to create and run modules needed to perform the necessary tasks. The processing phase involved using many different methods of noise removal in order to clean up the original data.

Talks

Royal Astronomical Society National Astronomy Meeting — *Llandudno, United Kingdom*

"Using BiSON to detect solar internal g-modes" — *Jul. 2015*

SpaceInn Global Helioseismology Team Meeting — *Freiburg, Germany*

"New approaches to low-frequency BiSON analysis and tests on extracting solar-cycle variability" — *Mar. 2015*

IMPACT

University of Warwick, United Kingdom

"Spin-Orbit Misalignment in *Kepler* Red Giants"

2014

Royal Astronomical Society National Astronomy Meeting

Portsmouth, United Kingdom

"Using BiSON to detect solar internal g-modes"

Jun. 2014

Conference Posters

TASC3/KASC10 Conference

University of Birmingham, United Kingdom

"Are stellar inclination angles distributed randomly?"

Jul. 2017

Joint TASC2 & KASC9 - SPACEINN & HELAS8 Conference

Angra do Heroismo, Terceira-Azores, Portugal

"Using Kepler data and machine learning to help improve constraints on global parameters of red giants observed with K2 and TESS"

Jul. 2016

PERCAT LES & EPS Research conference

University of Birmingham, United Kingdom

"Sounding Stars: Asteroseismology"

2016

Joint TASC1 & KASC8 Conference

University of Birmingham, United Kingdom

"Using machine learning to simplify red giant peak-bagging"

2016

IMPACT

University of Warwick, United Kingdom

"Using BiSON to detect solar internal g-modes"

2014

Joint CoRoT3 & KASC7 conference

Toulouse, France

"Using BiSON to detect solar internal g-modes"

2014

Publications

First-Author

Kuszlewicz, J. S., North, T. S. H., Chaplin, W. J., Bieryla, A. *et al.*, 2016, Asteroseismic Determination of the obliquity of the red-giant eclipsing binary KOI-3890, *in prep.*

North, Thomas S. H., Campante, Tiago L., Miglio, Andrea, Davies, Guy R., *et al.* (incl. **JSK**), 2017, *The masses of retired A stars with asteroseismology: Kepler and K2 observations of exoplanet hosts*, MNRAS, **472**, 1866 (arXiv:1708.00716)
Colman, Isabel L., Huber, Daniel, Bedding, Timothy R., **Kuszlewicz, J. S.**, *et al.*, 2017, *Evidence for compact binary systems around Kepler red giants*, MNRAS, **469**, 3802 (arXiv:1705.00621)
Campante, Tiago L., Veras, Dimitri, North, Thomas S. H., Miglio, Andrea, *et al.* (incl. **JSK**), 2017, *Weighing in on the masses of retired A stars with asteroseismology: K2 observations of the exoplanet-host star HD 212771*, MNRAS, **469**, 1360 (arXiv:1704.01794)
North, Thomas S. H., Chaplin, William J., Gilliland, Ronald L., Huber, Daniel, *et al.* (incl. **JSK**), 2017, *A simple model to describe intrinsic stellar noise for exoplanet detection around red giants*, MNRAS, **465**, 1308 (arXiv:1610.08688)
Davies, Guy R., Lund, Mikkel N., Miglio, Andrea, Elsworth, Yvonne, *et al.* (incl. **JSK**), 2017, *Using red clump stars to correct the Gaia DR1 parallaxes*, Astronomy and Astrophysics, **598** (arXiv:1701.02506)
Campante, T. L., Schofield, M., **Kuszlewicz, J. S.**, Bouma, L., *et al.*, 2016, *The Asteroseismic Potential of TESS: Exoplanet-host Stars*, ApJ, **830**, 138 (arXiv:1608.01138)
Miglio, A., Chaplin, W. J., Brogaard, K., Lund, M. N., *et al.* (incl. **JSK**), 2016, *Detection of solar-like oscillations in relics of the Milky Way: asteroseismology of K giants in M4 using data from the NASA K2 mission*, MNRAS, **461**, 760 (arXiv:1606.02115)
Campante, T. L., Lund, M. N., **Kuszlewicz, J. S.**, Davies, G. R., *et al.*, 2016, *Spin-Orbit Alignment of Exoplanet Systems: Ensemble Analysis Using Asteroseismology*, ApJ, **819**, 85 (arXiv:1601.06052)
Quinn, Samuel N., White, Timothy. R., Latham, David W., Chaplin, William J., *et al.* (incl. **JSK**), 2015, *Kepler-432: A Red Giant Interacting with One of its Two Long-period Giant Planets*, ApJ, **803**, 49 (arXiv:1411.4666)