

Oliver James Hall

PhD student in asteroseismology

programming

Python (advanced)
Unix, LaTeX, Git
(intermediate)
R, SQL/ADQL (basic)

skills

Stan
emcee
Bayesian statistics
Hierarchical models
Software development
& publication (Python)

languages

English, Dutch
(bilingual)

contact

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Astronomy
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research interests

With the recent succes of the *Kepler* and K2 missions, and the ongoing release of data from *Gaia* and TESS, we are in posession of a vast amount of astronomical data. I am intersted in leveraging these large data sets to make inferences of stellar physics, & analysis systematics. I do this through a Bayesian use of populations of asteroseismic data, in combination with other sources. I have used hierarchical models to study systematics and constrain the Red Clump standard candle to unprecedented precision. My current work focuses on studying the relation between mass, rotation and age of solar-like stars in *Kepler* and K2 fields.

education

- 2016 →2020 **PhD in Physics & Astronomy** University of Birmingham, UK
Supervisor: Dr. Guy R. Davies
"Asteroseismology with Kepler, K2 and TESS"
- 2012 →2016 **M.Sci. Physics & Astrophysics** University of Birmingham, UK
Disseration supervisor: Prof. William J. Chaplin
"Detecting Signatures of Stellar Activity Cycles in Solar-Type Stars Using Asteroseismic Analysis of P-Mode Amplitude Shifts"
1st Class w. Honours
- 2006 →2012 **Gymnasium** Gemeentelijk Gymnasium Hilversum, Netherlands
9/10 in Maths, Physics and Chemistry
8.5/10 average across eleven subjects

teaching and research

- 2017 →now **2nd Year Laboratory Projects Demonstrator** University of Birmingham, UK
Taught projects varying from spectroscopy to the building of a theremin. Helped students build apparatus, understand their results, and was responsible for marking their work and providing constructive feedback.
- 2016 →now **3rd Year Observatory Laboratory Supervisor** University of Birmingham, UK
Helped supervise students in their research using the University of Birmingham Observatory. Helped the students understand their results, as well as aiding them in the use of IRAF, Unix, LaTeX and Python.
- 2015 **Summer Undergraduate Reserach Experience (SURE)** University of Leicester, UK
Was selected to perform a six-week project using Python to program a Universal-Robots UR5 robotic arm system to perform careful experimantal testing on a prototype focal plane for the Cherenkov Telescope Array under Dr. Jon Lapington. Disseminated results through a report and group presentation.
- 2015 **Ogden Trust Teach Physics Intern** Bishop Challoner Catholic College, Birmingham, UK
Was selected as one of the Ogden Trust's Teach Physics interns. I helped teach pupils throughout lessons and prepared, taught a lesson & careers workshop of my own design.

grants & awards

2018	IOP Research Student Conference Fund - £300 (<i>declined</i>)	Institute of Physics, UK
2016	Royal Society Partnership Grant - £3000	The Royal Society, UK
2015	Teach Physics Outstanding Intern 2015 - shortlisted	The Ogden Trust

presentations

2018 Dec.	Birmingham-Warwick Science Meet-Up "Testing asteroseismology with Gaia DR2: Hierarchical Models & the Red Clump"	University of Warwick, UK
2018 Jul.	TASC4/KASC11 "Testing asteroseismology with Gaia DR2: Luminosity of the Red Clump"	Aarhus University, Denmark
2017 Jul.	TASC3/KASC10 (poster presentation) "Mixture Models applied to Kepler backgrounds & development for TESS"	University of Birmingham, UK
2017 Apr.	T'DA 2 "Estimating TESS backgrounds with mixture models – Update"	Aarhus University, Denmark
2016 Nov.	T'DA 1 "Estimating TESS backgrounds with mixture models"	University of Birmingham, UK

conferences & research visits

2019 Jan.	T'DA 8	Aarhus University, Denmark
2018 Oct.	T'DA 5	Ohio State University, OH, USA
2018 Oct.	3 week research visit to the KeplerGO office	NASA Ames Research Centre, CA, USA
2018 Jul.	T'DA 4	Aarhus University, Denmark
2018 Jul.	TASC4/KASC11	Aarhus University, Denmark
2018 Jan.	1 week research visit to SAC	Aarhus University, Denmark
2017 Dec.	T'DA 3	KU Leuven, Belgium
2017 Jul.	TASC3/KASC10	University of Birmingham, UK
2017 Apr.	T'DA 2	Aarhus University, Denmark
2016 Nov.	Asteroseismology of stellar activity cycles	Observatoire de la Côte d'Azur, France
2016 Nov.	T'DA 1	University of Birmingham, UK

outreach & engagement

2019 →now	Author, Astrobites Collaboration Write and edit monthly summaries of astronomy papers for an undergraduate level for the website Astrobites.	
2019 Jan.	Featured Astronomer, Astrotweeps Hosted the @astrotweeps Twitter account for a week, providing public-level explanations of asteroseismology and space-based photometry.	
2018 →2019	LOC & SOC, 9th BEAR PGR Conference Organised local annual high performance computing conference.	University of Birmingham, UK
2018 →now	Demonstrator, Applicant Visit Day Developed and taught laboratory sessions for undergraduate applicants.	University of Birmingham, UK
2016 →2017	Partnered Researcher, Royal Society Partnership Grant Developed and taught a series of lessons and lab activities engaging Year 9 pupils with exoplanet characterisation and asteroseismology.	

community services

2018 →now	Member of the lightkurve collaboration	NASA Ames Research Centre, CA, USA
2017	LOC member for TASC3/KASC11	University of Birmingham, UK
2016 →now	Member of the <i>TESS Data for Asteroseismology</i> (T'DA) collaboration	
continuous	Publish educational blogs and tutorials online	

publications

Hall, O. J., Davies, G. R., Elsworth, Y. et al.

Testing asteroseismology with Gaia DR2: Hierarchical models of the Red Clump

Submitted to MNRAS

Bugnet, L., García, R. A., Mathur, S., Davies, G. R., **Hall, O. J.**, Lund, M. N., Rendle, B. M.

FliPer_{Class}: In search of solar-like pulsators among TESS targets

arXiv e-prints, 2019

arXiv:1902.09854

Huber, D., Chaplin, W. J., Chontos, A. ... **Hall, O. J.** ... et al. [1 citation]

A Hot Saturn Orbiting An Oscillating Late Subgiant Discovered by TESS

arXiv e-prints, 2019

arXiv:1901.01643

Lightkurve Collaboration, Cardoso, J. V. d. M., Hedges, C. ... **Hall, O. J.** ... et al. [2 citations]

Lightkurve: Kepler and TESS time series analysis in Python

Astrophysics Source Code Library, 2018

ascl:1812.013

Bugnet, L., García, R. A., Davies, G. R. ... **Hall, O. J.** ... et al. [7 citations]

FliPer: A global measure of power density to estimate surface gravities of main-sequence solar-like stars and red giants

Astronomy & Astrophysics, 2018

doi:0.1051/0004-6361/201833106, **arXiv:1809.05105**

Khan, S., **Hall, O. J.**, Miglio, A. et al. [5 citations]

The Red-giant Branch Bump Revisited: Constraints on Envelope Overshooting in a Wide Range of Masses and Metallicities

The Astrophysical Journal, 2018

doi:10.3847/1538-4357/aabf90, **arXiv:1804.06669**

Davies, G. R., Lund, M. N. and Miglio, A. ... **Hall, O. J.** ... et al. [20 citations]

Using red clump stars to correct the Gaia DR1 parallaxes

Astronomy & Astrophysics, 2017

doi:10.1051/0004-6361/201630066, **arXiv:1701.02506**