Paul James Wright

CONTACT INFORMATION

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Publication List: SAO/NASA ADS

RESEARCH INTERESTS

My interests range from stellar to solar physics; my main interests lie in the heating of the solar atmosphere, including active regions and loops. I have expertise in the analysis of spectroscopic and narrowband Extreme Ultra-Violet (EUV) and X-ray data from the *Solar Dynamics Observatory* and *Hinode*, in addition to the hard X-ray (HXR) observations from *NuSTAR*'s heliophysics campaign. I am currently investigating the modelling of coronal loop light-curves using the `EBTEL` (Enthalpy-Based Thermal Evolution of Loops) hydrodynamics code with particular interest in the weak bremmstrahlung components, and the relevance for future soft to hard X-ray instruments and missions.

EDUCATION

University of Glasgow, Glasgow, UK — 2014 – April 2018
Ph.D. Solar Physics
Thesis Topic: *The Energetics of Small Flares and Brightenings*
Advisers: Dr Iain G. Hannah, Dr Alexander MacKinnon

University of Southampton, Southampton, UK — 2010 – 2014
MPhys Astrophysics with a year abroad
First-class honours (1:1)
Adviser: Professor Malcolm Coe

Harvard University/Harvard-Smithsonian CfA, Cambridge, MA, USA — 2013 – 2014
MPhys Astrophysics with a year abroad
Thesis Topic: *Superflare Rates of Solar-Like Stars*
Advisers: Dr Steven H. Saar, Dr Jeremy J. Drake

CURRENT ACADEMIC APPOINTMENT

Affiliate Staff Member, University of Glasgow — 2017 – present
SUPA School of Physics and Astronomy

PREVIOUS ACADEMIC APPOINTMENTS

Post-Graduate Research Assistant, University of Glasgow — 2014 – 2017
SUPA School of Physics and Astronomy
Project: *The Energetics of Small Flares and Brightenings*

- Analysed observations of the Sun with *NuSTAR*, a telescope not designed for heliophysics. These observations are the most sensitive of their kind and have resulted in numerous, wide-ranging, highly-collaborative peer-reviewed publications.
- Analysed non-flaring coronal time-series in pursuit of signatures of the coronal heating mechanism. Techniques included time-lag analysis (cross-correlation), Fourier analysis, wavelet analysis, and local intermittency measure (LIM).
- Studied the temperature distribution of the solar atmosphere through the recovery of an ill-posed inverse problem (the differential emission measure, DEM) using techniques such as Tikhonov regularisation, Markov-chain Monte Carlo, and sparsity.
- The press-release image produced from the *NuSTAR* observations obtained for Wright *et al.* 2017 was published by numerous news outlets, and is one of the five iconic images from *NuSTAR*'s first five years in space.

Collaborators: *Dr Iain Hannah, Dr Alexander MacKinnon*

Visiting Researcher, NASA Goddard Space Flight Center (GSFC) — 2016
Heliophysics Science Division

- Explored the possibility of implementing DEM maps in the Helioviewer project, and their usefulness as an input for various established analysis techniques.

Collaborators: *Dr Nicholeen Viall, Dr Jack Ireland*

Previous Academic Appointments (cont.)

Research Scholar, Harvard-Smithsonian Center for Astrophysics (CfA) 2013 – 2014
Solar and Stellar X-Ray Group

- Designed and implemented a sophisticated stellar flare detection routine for long-cadence (30 mins) *Kepler* data obtained from a proprietary set of spectroscopically verified solar-type stars in three open clusters.
- A preliminary version of this work had coverage by Science, and The Smithsonian Magazine.

Collaborators: *Dr Steven Saar, Dr Søren Meibom, Dr Jeremy Drake, Dr Vinay Kashyap*

Summer Research Intern, University of Southampton 2013
Astronomy Group

- Investigated the presence of double blue straggler sequences in globular clusters using Hubble Space Telescope (ACS, WFPC2) data.

Collaborators: *Dr Andrea Dieball*

Refereed Journal Publications

[1] Marsh, A. J., Smith, D. M., Glesener, L. *et al* 2017. *First NuSTAR Limits on Quiet Sun Hard X-Ray Transient Events*, ApJ, 849, 131

[2] Wang, J., Simões, P. J. A., Jeffrey, N. L. S. *et al* 2017. *Observations of Reconnection Flows in a Flare on The Solar Disk*, ApJL, 847, L1

[3] **Wright, P. J.**, Hannah, I. G., Grefenstette, B. W., *et al* 2017. *Microflare Heating of a Solar Active Region Observed with NuSTAR, Hinode/XRT, and SDO/AIA*, ApJ, 844, 132

[4] Kuhar, M., Krucker, S., Hannah, I. G., *et al* 2017. *Evidence of Significant Energy Input in the Late Phase of a Solar Flare from NuSTAR X-ray Observations*, ApJ, 835, 6

First Author Publications in Preperation

[5] **Wright, P. J.**, Hannah, I. G., Viall, N. M., *et al*

[6] **Wright, P. J.**, Saar, S. H., Meibom, S., *et al*

Conferences, Workshops, & Schools

Invited Oral Presentations

ISSI Team Meeting: Coronal Nanoflares, Bern, CH 2016
Harvard-Smithsonian Center for Astrophysics, Cambridge, MA, USA 2014

Oral/ePoster Presentations

Solar Physics Division Meeting (SPD/AAS), Portland, OR, USA 2017
Coronal Loops Workshop VIII, Palermo, Sicily, IT 2017
Living with a Star (SDO/LWS) Workshop, Burlington, VT, USA 2016
Hinode 10, Nagoya, JP 2016
National Astronomy Meeting 2016, Nottingham, UK 2016
Hinode 9, Belfast, UK 2015
Glasgow-Cambridge Flare Workshop, Glasgow, UK 2015

Poster Presentations

European Solar Physics Meeting (ESPM), Budapest, HU 2017
Solar Physics Division Meeting (SPD/AAS), Portland, OR, USA 2017
Living with a Star (SDO/LWS) Workshop, Burlington, VT, USA 2016
Coronal Loops Workshop VII, Cambridge, UK 2015
National Astronomy Meeting (NAM) 2015, Llandudno, UK 2015
223rd AAS Meeting, National Harbor, MD, USA 2014

Schools Attended

CESRA Radio Summer School 2015, Glasgow, UK 2015
STFC Advanced Summer School in Solar Physics, Dundee, UK 2014

CONFERENCES, WORKSHOPS, & SCHOOLS (CONT.)

Conferences/Workshops Attended

NuSTAR Heliophysics Workshop (remote participation), Berkeley, CA, USA	2017
SUPA Cormack Astronomy Meeting, Edinburgh, UK	2015
Royal Astronomical Society Discussion Meeting: Results from IRIS, London, UK	2015
SUPA Cormack Astronomy Meeting, Edinburgh, UK	2014
1st Space Glasgow Research Conference, Glasgow, UK	2014

AWARDS AND GRANTS TOTAL: £7000

University of Glasgow

Solar Physics Division Meeting (SPD/AAS) Student Poster Award	2017
Solar Physics Division Meeting (SPD/AAS) Studentship Award	2017
Coronal Loops Workshop VIII Travel Award	2017
National Astronomical Observatory of Japan Travel Award	2016
Hinode 9 Travel Award	2015
European Space Agency/Cambridge Philosophical Society Travel Award	2015

University of Southampton

Research Scholarship	2013
Summer Studentship Grant	2013

TEACHING

Coursera Inc.

"Data Scientists Toolbox" Community Mentor 2017 – present

An invited mentor of a course in the Data Science specialization offered by Johns Hopkins University.

University of Glasgow

Astronomy 1 Tutorial Demonstrator 2016 - 2017

Supervised students, and marked first-year astronomy problem sets.

Astronomy 3/4 (Honours) Laboratory Demonstrator 2015 - 2016

Demonstrated, supervised, and marked a number of final-year research projects covering topics such as asteroid light curves, and solar limb darkening.

Physics Pre-University Summer School 2015

Taught at a pre-university school for students entering first year.

MEMBERSHIPS

***NuSTAR* Heliophysics Working Group**, Member 2015 – present

International Space Science Institute (ISSI), Young Scientist Member 2015 – present

Member of Paola Testa's ISSI Team: *New Diagnostics of Particle Acceleration in Solar Coronal Nanoflares from Chromospheric Observations and Modeling*

Royal Astronomical Society, RAS Fellow 2014 – present

COMMUNITY INVOLVEMENT

Nature Communications, Reviewer 2017 – present

Glasgow Astronomy & Astrophysics Group Meeting, Organiser 2017

CESRA Radio Summer School, Volunteer Organiser 2015

SCIENTIFIC OUTREACH

Glasgow Science Centre, Demonstrator	2016
British Science Week, Demonstrator	2016
Institute of Physics: *Women and Girls in Science*, Demonstrator	2016
Scottish Television (STV), Guest Presenter	2015
World Wide Telescope, Ambassador	2013 – 2014
BBC Stargazing Live, Demonstrator	2013
So'ton Astrodome, Demonstrator	2012
BBC Bang Goes The Theory Roadshow, Demonstrator	2012

SCIENTIFIC OUTREACH (CONT.)

UK Solar Physics (UKSP) Nuggets, concise, easy-to-read science articles

84. The first *NuSTAR* microflare 2017

Hinode/XRT Picture of the Week (XPOW)

The First Microflare Observations with *Hinode*/XRT & *NuSTAR* 2017

PERSONAL PROJECTS

ColourBlind, A repository for colour-blind-friendly colour tables.

PROFESSIONAL DEVELOPMENT

Coursera, Inc. (MOOC Platform)

Using Coursera.org, a massive open online course (MOOC) platform, to take specializations (a series of related courses and a final capstone project) offered by accredited universities to further develop skills and understanding in a wide range of computer science topics.

Data Science, Johns Hopkins University 2017 – present
Nine-course (plus capstone) introduction to data science.

Mastering Software Development in R, Johns Hopkins University 2017 – present
Four-course (plus capstone) specialization providing riguourous training in R.

Statistics with R, Duke University 2017 – present
Four-course (plus capstone) specialization providing further training in R, with emphasis on statistics.

TECHNICAL SKILLS:

Computing: Python, R, IDL, LaTeX, IRAF, git, GitHub, Linux/Unix, Mac OSX, Microsoft Windows, Bash, Microsoft Office, Adobe Creative Cloud

General: Data Analysis, Data Visualization, Interdisciplinary Collaboration, Public Speaking, Statistics, Teaching, Writing (Technical & Lay)