

Dr. James Wurster

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Employment

- 2023 **Lecturer**
School of Science and Engineering
University of Dundee, Dundee, Scotland
- 2019 – 2023 **Research Fellow**
School of Physics and Astronomy
University of St Andrews, St Andrews, Scotland
- 2016 – 2019 **Research Fellow**
Astrophysics Group, School of Physics and Astronomy
University of Exeter, Exeter, England
- 2013 – 2016 **Research Fellow**
Monash Centre for Astrophysics (MoCA), School of Physics and Astronomy
Monash University, Melbourne, Australia

Please note that the remainder of this CV highlights my skills and achievements during my academic career.

Education

- 2013 **Ph.D. Astronomy**
Department of Astronomy and Physics
Saint Mary's University, Halifax, Canada
Advisor: Dr. Robert J. Thacker
- 2008 **M.Sc. Astronomy**
Department of Physics, Engineering Physics and Astronomy
Queen's University, Kingston, Canada
Advisor: Dr. Kayll Lake
- 2006 **B.Sc. (Honours) Mathematics and Physics**
The University of Western Ontario, London, Canada
Honours Thesis Advisor: Dr. Shantanu Basu

Fellowships, awards, and scholarships

- 2021-2022 PI: *The scales of star formation*. Thematic project awarded on the DiRAC computing infrastructure via the 13th call
- 2015 Awarded 600,000CPU hours from the Australian National Computational Merit Allocation Scheme (NCMAS)
- 2009 – 2011 National Science and Engineering Research Council of Canada (NSERC) Canada Graduate Scholarship – Ph. D. Level

Teaching summary

Winter 2023	<i>Lecturer:</i> Space Physics and Astronomy; University of Dundee, Scotland
Autumn 2022	<i>Teaching Assistant:</i> Computational Physics; University of St Andrews, Scotland
Autumn 2021	<i>Guest-Lecturer:</i> Contemporary Astrophysics; University of St Andrews, Scotland
Winter 2021	<i>Co-Lecturer:</i> Fluids; University of St Andrews, Scotland (Taught online via MS Teams & Panopto)
Winter 2020	<i>Co-Lecturer:</i> Fluids; University of St Andrews, Scotland (Taught in-person and online via MS Teams & Panopto)
Winter 2020	<i>Teaching Assistant:</i> Computational Astrophysics; University of St Andrews, Scotland (Tutored in-person and online via MS Teams)
Autumn 2015	<i>Lecturer:</i> Stars & Galaxies (Galaxy Interactions & Galaxy Clusters module); Monash University, Australia
Spring 2013	<i>Instructor:</i> University Physics laboratory; Saint Mary's University, Canada
2012	<i>Instructor:</i> Physics for Life Science laboratory; Saint Mary's University, Canada
2008 – 2012	<i>Teaching Assistant:</i> Physics for Life Science & University Physics laboratories; Saint Mary's University, Canada

Supervision summary

2022 – 2023	Mr. Boden Simpson: MPhys student, University of St Andrews, Scotland
2022 – 2023	Mr. Thomas Rintoul*: MPhys student, University of St Andrews, Scotland
2022	Ms. Leandra Sethares: MSc student, University of St Andrews, Scotland
2021 – 2023	Ms. Katerina Klos*: PhD candidate, University of St Andrews, Scotland
2021 – 2023	Ms. Cheryl Lau*: PhD candidate, University of St Andrews, Scotland
2021 – 2022	Mr. Alexander Csukai: MPhys student, University of St Andrews, Scotland
2021 – 2022	Mr. Andrew Duncan: MPhys student, University of St Andrews, Scotland
2021 – 2022	Ms. Kana Askari: MSc student, University of St Andrews, Scotland
2020 – 2021	Mr. Brandon Myers: MSc student, University of St Andrews, Scotland
2020	Mr. Adam Mousley*: MSc student, University of St Andrews, Scotland
2019 – 2020	Mr. Connar Rowan: MPhys student, University of St Andrews, Scotland
2015 – 2016	Ms. Madeline Marshall*: Third year summer student, Monash University, Australia
2015 – 2016	Mr. Bernard Field*: First year summer student, Monash University, Australia
2015	Mr. David Liptai*: Honours student, Monash University, Australia

* indicates co-supervision

Organisation of scientific meetings

2023	Scientific Organising Committee member: 2023 Phantom Users Workshop. Hosted at Monash University, Melbourne, Australia. Approx. 50 participants.
2019	Local Organising Committee member: 14th International SPHERIC Workshop. Hosted at the University of Exeter, England. Approx. 120 participants.
2018	Scientific Organising Committee member: 1st Phantom Users Workshop. Hosted at Monash University, Melbourne, Australia. Approx. 30 participants.
2017	Local Organising Committee member: Seventh Annual Dirac Science Day. Hosted at the University of Exeter, England. Approx. 50 participants.

Membership on national/international committees

2022 – 2023	Review editor for <i>Frontiers in Astronomy and Space Sciences: Stellar and Solar Physics</i> (includes leading the assembly of a Research Topics collection)
2021 – 2023	STFC DiRAC Resource Allocation Committee: Astronomy & Cosmology Sub-Panel

Community responsibilities

- 2022 – 2023 Co-moderator of the *DiRAC User's Forum*, a community-lead *Slack* channel to provide unofficial support and guidance to the members of the DiRAC community
- 2018 – 2023 Lead developer of the *Phantom* astrophysical code, which is developed and used by dozens of scientists internationally

Institutional responsibilities

- 2022 – 2023 Equality & Diversity committee member, St Andrews University, Scotland
- 2021 – 2023 Co-coordinator: Astronomy Lunch Time talks (i.e., astronomy seminar series), St Andrews University, Scotland
- 2020 – 2023 Contract Research Staff representative for Astronomy, St Andrews University, Scotland
- 2020 – 2022 Coordinator: weekly star formation meetings (brings together students & staff from 3 research groups within the department), St Andrews University, Scotland
- 2015 – 2016 Co-coordinator: MoCA Public Talk Series, Monash University, Australia
- 2014 Coordinator: MoCA Seminar Series, Monash University, Australia

Public outreach

- Mar. 2023 Event volunteer: *St Andrews' Observatory Open Night: Ask an Astronomer*. University of St Andrews, St Andrews, Scotland
- Feb. 2023 Public Talk: "Using computer simulations to model the formation of stars and their discs". *Astronomical Society of Edinburgh*, Edinburgh, Scotland
- Sept. 2021 Magazine contribution: "Why do discs form around protostars?" *All About Space*, Issue 121.
- Dec. 2020 Audio project (unused) contribution: "Turning" *Byre Theatre*, St Andrews, Scotland.
- Oct. 2020 Public Talk: "Modelling the birth of stars." *Dundee Astronomical Society*, Dundee, Scotland
- Sept. 2017 Public Talk: "My career in astronomy: From watching sci-fi to studying the stars." *North Bay Astronomy Club*, North Bay, Canada

Conference talks: Invited

- Feb. 2023 *4th Phantom Users Workshop*, Melbourne, Australia (presented remotely)
"Magnetic fields in SPH: A star formation case study"
- Feb. 2022 *St Andrews Interdisciplinary Science Conference*, St Andrews, Scotland
"Star formation with MHD: What we learn from computer simulations"
- Feb. 2020 *3rd Phantom + MCFOST Users Workshop*, Melbourne, Australia (presented remotely)
"Magnetic fields & Star formation"
- Nov. 2019 *UK Fluids Network SPH SIG Meeting: SPH - Greatest Hits*, Durham, England
"Modelling the birth of stars: Now with more physics"
- Feb. 2018 *1st Phantom Users Workshop*, Melbourne, Australia
"Physical and Artificial Resistivity (in smoothed particle magnetohydrodynamics)"
- Dec. 2017 *Computational MHD Workshop 2017*, Leeds, England
"Smoothed Particle Magnetohydrodynamics"

Conference talks: Contributed

2022	Star Formation in Different Environments 2022
2021	Magnetic Fields & the Structure of the Filamentary ISM (pre-recorded talk), ISM 2021
2019	Great Barriers in Planet Formation, 14th International SPHERIC workshop
2018	The Wonders of Star Formation, 1st European Phantom Users Workshop, The Olympian Symposium 2018, Cosmic rays: Salt of the star formation recipe, 1st Phantom Users Workshop, Magnetic Fields or Turbulence?
2017	12th International SPHERIC workshop
2016	Sixth Annual Dirac Science Day, ANITA 2016 meeting
2015	Protoplanetary Disk Dynamics & Planet Formation, ANITA 2015 meeting

Seminars

2023	University of Dundee
2022	University of Edinburgh (Institute for Astronomy), University of St Andrews (Applied Mathematics), University of Oxford, University of Cambridge (DAMTP)
2021	University of Leicester
2020	University of St Andrews
2019	Chalmers University of Technology, University College London
2018	University of Hertfordshire, University of Cambridge (DAMTP), Cardiff University, University of Southampton, Academia Sinica Institute of Astronomy and Astrophysics
2017	University of Leicester, University of Toronto (CITA), University of Western Ontario, Monash University (MoCA)
2016	University of Exeter, Swinburne University, Monash University (MoCA)
2015	Monash University (Math), University of Exeter, University of Melbourne
2014	University of Central Lancashire, Monash University (MoCA)

Published papers in refereed journals

Total	36
First author	21
Invited review	1

Journal articles I refereed

2022	Monthly Notices of the Royal Astronomical Society (1), Frontiers in Astronomy and Space Sciences (1), New Astronomy (1), Astrophysical Journal (1)
2021	Monthly Notices of the Royal Astronomical Society (2), Open Astronomy (1)
2020	Astrophysical Journal (2), Astrophysical Journal Letters (1), Astrophysics & Space Science (1), SN Applied Sciences (1), Astronomische Nachrichten (1)
2019	Astrophysical Journal (2), Astronomy & Astrophysics (1)
2018	Monthly Notices of the Royal Astronomical Society (2), Astronomy & Astrophysics (1), Astrophysical Journal (2), Astronomy and Computing (1)
2017	Monthly Notices of the Royal Astronomical Society (1)
2016	Monthly Notices of the Royal Astronomical Society (1), Publications of the Astronomical Society of Australia (1)
2015	Publications of the Astronomical Society of Australia (1)

Proposals I refereed

2023	One grant proposal to national funding agency (agency withheld for privacy)
2022	Two grants proposal to national funding agencies (agencies withheld for privacy)
2017	DiRAC Resource Allocation Proposal

PhD theses I examined

2022	Swinburne University, Australia (1)
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Scientific research summary and primary astrophysical codes used

Programmes	Moodle, Python, Fortran, Microsoft Office including MS Teams, Panopto, Windows, MacOS, Linux
Keywords	stars: low-mass, stars: formation, stars: winds, outflows, protostellar discs: formation, turbulence, magnetic fields, magnetohydrodynamics (MHD), radiative transfer, methods: numerical
<i>Phantom</i>	Smoothed particle magnetohydrodynamics astrophysical code; public code. Roles: Lead developer (one of four); user. Reference: Price, Wurster, et al., 2018, PASA, 35:e031. Source: phantomsph.bitbucket.io
<i>sphNG</i>	Smoothed particle magnetohydrodynamics astrophysical code; public code. Roles: Main author (one of several); user.
<i>Nicil</i>	Library to calculate the non-ideal MHD coefficients; public library. Role: Sole developer and maintainer; user. References: Wurster, 2016, PASA, 33:e041; Wurster, 2021, MNRAS, 501:5873-5891 Source: bitbucket.org/jameswurster/nicil/

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