

Jack Halliday

Employment

- 2023–present **Postdoctoral researcher, University of Oxford**
Experimental search for Axion Like Particles (ALPS) using high powered optical lasers and X-Ray free electron lasers.
- 2020–2023 **Postdoctoral researcher, Imperial College London**
Experimental study of the interaction between prompt X-rays and solid density targets.

Education

- 2016–2020 **PhD Plasma Physics, Imperial College London**
Project: Characterisation of particle acceleration in pulsed-power driven magnetic-reconnection experiments through the use of X-Ray self-emission diagnostics. *Supervisor:* S. V. Lebedev
- 2012–2016 **MSci Physics, Imperial College London, First Class (Hons)**
Final year project: An experimental study of shock waves in magnetised plasma flows

Teaching

- 2020–2023 **Master's project supervision (Imperial College)** – Provided training in laboratory skills and support on research direction to students completing their Master's thesis projects in the MAGPIE research laboratory.
- 2020–2021 **Transmission lines lab demonstration (Imperial College)** – Supported 2nd yr undergraduates in a remote lab over COVID shutdown. Students were sent a test circuit and oscilloscope. Demonstration was performed using video conferencing. Assessed performance in lab and in written reports.
- 2018–2019 **Microprocessor course supervision (Imperial College)** – Supervised projects in which 3rd yr undergraduates interfaced a microprocessing unit with hardware to create a product prototype.
- 2016–2018 **Spectroscopy lab demonstration (Imperial College)** – Supported 2nd yr undergraduates undertaking a spectroscopy experiment. Assessed performance in lab and in written reports.

Invited Talks

- 2023 *"Laboratory astrophysics with radiatively driven plasma flows."* International Conference on Dense Z-Pinches, Ann Arbor, Michigan.
- 2022 *"Radiatively driven plasma flows in experiments on the MAGPIE pulsed-power generator."* Journal of Plasma Physics Colloquium, virtual seminar.
- 2021 *"Investigating magnetised, radiatively driven plasmas with a university scale pulsed-power generator."* APS Division of Plasma Physics Annual Meeting, Pittsburgh, Pennsylvania.

Service

- 2023–present Peer-review for Physics Review Letters
- 2022–present Peer-review for Physics of Plasmas
 - 2022–2023 Postdoctoral representative on the departmental occupational health committee
 - 2022–2023 Member of the physics department's LGBTQ+ allies network
 - 2022–2023 Organising group member for the Imperial 600 (university wide LGBTQ+ network)
 - 2021–2023 Representative for plasma physics on the departmental postdoctoral committee

Contributed Presentations

- 2023 Topics in Astroparticle and Underground Physics, Vienna, Austria (poster)
- 2023 IOP Plasma Physics Conference, Oxford, United Kingdom. (talk)
- 2022 APS Division of Plasma Physics Annual Meeting, Spokane, Washington. (talk)
- 2022 High Energy Density Laboratory Astrophysics, Lisbon, Portugal. (talk)
- 2022 IEEE International Conference on Plasma Science, Seattle, Washington. (talk)
- 2022 High Temperature Plasma Diagnostics, Rochester, New York. (poster)
- 2022 IOP Plasma Physics Conference, Liverpool, United Kingdom. (talk)
- 2020 APS Division of Plasma Physics Annual Meeting, virtual meeting. (poster)
- 2019 APS Division of Plasma Physics Annual Meeting, Fort Lauderdale, Florida. (talk)
- 2018 APS Division of Plasma Physics Annual Meeting, Portland, Oregon. (talk)
- 2018 EPS Plasma Physics Division Annual Meeting, Prague, Czechia. (poster)
- 2018 High Energy Density Laboratory Astrophysics, Kurashiki, Japan. (talk)
- 2017 APS Division of Plasma Physics Annual Meeting, Milwaukee. (talk)

Publications

- 2023 S. Merlini, J. D. Hare, G. C. Burdiak, J. W. D. Halliday, A. Ciardi, J. P. Chittenden, T. Clayson, A. J. Crilly, S. J. Eardley, K. E. Marrow, D. R. Russell, R. A. Smith, N. Stuart, L. G. Suttle, E. R. Tubman, V. Valenzuela-Villaseca, T. W. O. Varnish, and S. V. Lebedev. "Radiative cooling effects on reverse shocks formed by magnetised supersonic plasma flows" *Physics of Plasmas* 30, 092102 DOI:10.1063/5.0160809
- 2023 V. Valenzuela-Villaseca, L. G. Suttle, F. Suzuki-Vidal, J. W. D. Halliday, S. Merlini, D. R. Russell, E. R. Tubman, J. D. Hare, J. P. Chittenden, M. E. Koepke, E. G. Blackman, and S. V. Lebedev, "*Characterization of Quasi-Keplerian, Differentially Rotating, Free-Boundary Laboratory Plasmas*" *Physics Review Letters* 130, 195101 doi: 10.1103/PhysRevLett.130.195101
- 2023 J. Strucka, B. Lukic, M. Koerner, J. W. D. Halliday, Y. Yao, K. Mughal, D. Maler, S. Efimov, J. Skidmore, A. Rack, Y. Krasik, J. Chittenden, and S. N. Bland "*Synchrotron radiography of Richtmyer–Meshkov instability driven by exploding wire arrays*" *Physics of Fluids* 35, 044108 DOI:10.1063/5.0144839.
- 2022 D. R. Russell, G. C. Burdiak, J. J. Carroll-Nellenback, J. W. D. Halliday, J. D. Hare, S. Merlini, L. G. Suttle, V. Valenzuela-Villaseca, S. J. Eardley, J. A. Fullalove, G. C. Rowland, R. A. Smith, A. Frank, P. Hartigan, A. L. Velikovich, and S. V. Lebedev, "*Perpendicular subcritical shock structure in a collisional plasma experiment*" *Physics Review Letters* 129, 225001 doi: 10.1103/PhysRevLett.129.225001
- 2022 R. N. Markwick, A. Frank, J. Carroll-Nellenback, E. G. Blackman, P. M. Hartigan, S. V. Lebedev, D. R. Russell, J. W. D. Halliday, and L. G. Suttle, "*Morphology of shocked lateral outflows in colliding hydrodynamic flows*" *Physics of Plasmas* 29, 102901 doi: 10.1063/5.0095166
- 2022 J. W. D. Halliday, A. Crilly, J. Chittenden, R. C. Mancini, S. Merlini, S. Rose, D. R. Russell, L. G. Suttle, V. Valenzuela-Villaseca, S. N. Bland, and S. V. Lebedev. "*Investigating radiatively driven, magnetized plasmas with a university scale pulsed-power generator (invited)*" *Physics of Plasmas* 29, 042107 doi: 10.1063/5.0084550

- 2022 J. Strucka, J. W. D. Halliday, T. Gheorghiu, H. Horton, B. Krawczyk, P. Moloney, S. Parker, G. Rowland, N. Schwartz, S. Stanislaus, S. Theocharous, C. Wilson, Z. Zhao, T. A. Shelkovenko, S. A. Pikuz, and S. N. Bland. "A portable X-pinch design for x-ray diagnostics of warm dense matter". *Matter and Radiation at Extremes*, 7, 016901. doi: 10.1063/5.0059926
- 2021 J. W. D. Halliday, S. N. Bland, J. D. Hare, S. Parker, L. G. Suttle, D. R. Russell, and S. V. Lebedev. "A time-resolved imaging system for the diagnosis of x-ray self-emission in high energy density physics experiments" *Review of Scientific Instruments* 92, 123507 doi: 10.1063/5.0073174
- 2021 L. G. Suttle, J. D. Hare, J. W. D. Halliday, S. Merlini, D. R. Russell, E. R. Tubman, V. Valenzuela-Villaseca, W. Rozmus, C. Bruulsema, and S. V. Lebedev. "Collective optical Thomson scattering in pulsed-power driven high energy density physics experiments (invited)." *Review of Scientific Instruments* 92, 033542. doi: 10.1063/5.0041118
- 2021 J. D. Hare, G. C. Burdiak, S. Merlini, J. P. Chittenden, T. Clayson, A. J. Crilly, J. W. D. Halliday, D. R. Russell, R. A. Smith, N. Stuart, L. G. Suttle, and S. V. Lebedev. "An imaging refractometer for density fluctuation measurements in high energy density plasmas (invited)." *Review of Scientific Instruments* 92, 033521. doi: 10.1063/5.0040919
- 2021 F. Suzuki-Vidal, T. Clayson, C. Stehlé, U. Chaulagain, J. W. D. Halliday, M. Sun, L. Ren, N. Kang, H. Liu, B. Zhu, J. Zhu, C. De Almeida Rossi, T. Mihailescu, P. Velard, M. Coteló, J. M. Foster, C. N. Danson, C. Spindloe, J. P. Chittenden, and C. Kuranz "First radiative shock experiments on the SG-II laser" *High Power Laser Science and Engineering*, 9, E27. doi: 10.1017/hpl.2021.17
- 2020 L. G. Suttle, G. C. Burdiak, C. L. Cheung, T. Clayson, J. W. D. Halliday, J. D. Hare, S. Rusli, D. R. Russell, E. R. Tubman, A. Ciardi, N. F. Loureiro, J. Li, A. Frank and S. V. Lebedev. "Interactions of magnetized plasma flows in pulsed-power driven experiments." *Plasma Physics and Controlled Fusion* 62, 1. doi: 10.1088/1361-6587/ab5296
- 2019 C. A. J. Palmer, P. T. Campbell, Y. Ma, L. Antonelli, A. F. A. Bott, G. Gregori, J. W. D. Halliday, Y. Katzir, P. Kordell, K. Krushelnick, S. V. Lebedev, E. Montgomery, M. Notley, D. C. Carroll, C. P. Ridgers, A. A. Schekochihin, M. J. V. Streeter, A. G. R. Thomas, E. R. Tubman, N. Woolsey, and L. Willingale. "Field reconstruction from proton radiography of intense laser driven magnetic reconnection." *Physics of Plasmas* 26, p. 083109. doi: 10.1063/1.5092733
- 2019 J. D. Hare, J. Macdonald, S. N. Bland, J. Dranczewski, J. W. D. Halliday, S. V. Lebedev, L. G. Suttle, E. R. Tubman, and W. Rozmus. "Two-colour interferometry and Thomson scattering measurements of a plasma gun" *Plasma Physics and Controlled Fusion* 61, 8. doi: 110.1088/1361-6587/ab2571
- 2018 L. G. Suttle, J. D. Hare, S. V. Lebedev, A. Ciardi, N. F. Loureiro, G. C. Burdiak, J. P. Chittenden, T. Clayson, J. W. D. Halliday, N. Niasse, D. Russell, F. Suzuki-Vidal, E. Tubman, T. Lane, J. Ma, T. Robinson, R. A. Smith, and N. Stuart. "Ion heating and magnetic flux pile-up in a magnetic reconnection experiment with super-Alfvénic plasma inflows." *Physics of Plasmas* 25, p. 042108. doi: 10.1063/1.5023664
- 2017 J. D. Hare, L. G. Suttle, S. V. Lebedev, N. F. Loureiro, A. Ciardi, J. P. Chittenden, T. Clayson, S. J. Eardley, C. Garcia, J. W. D. Halliday, T. Robinson, R. A. Smith, N. Stuart, F. Suzuki-Vidal, and E. R. Tubman. "An experimental platform for pulsed-power driven magnetic reconnection." *Physics of Plasmas* 25, p. 055703. doi: 10.1063/1.5016280
- 2017 J. D. Hare, S. V. Lebedev, L. G. Suttle, N. F. Loureiro, A. Ciardi, G. C. Burdiak, J. P. Chittenden, T. Clayson, S. J. Eardley, C. Garcia, J. W. D. Halliday, N. Niasse, T. Robinson, R. A. Smith, N. Stuart, F. Suzuki-Vidal, G. F. Swadling, J. Ma, and, J. Wu. "Formation and Structure of a Current Sheet in Pulsed-Power Driven Magnetic Reconnection Experiments". *Physics of Plasmas* 24, p. 102703. doi: 10.1063/1.4986012