JOSEPH ALLCOCK

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I am a software engineer working on tools for lighting and look-development in VFX. I have a background in physics, specialising in camera imaging and spectroscopy for nuclear fusion research.

EXPERIENCE

Software engineer

Foundry

2022 – present

- Working on the lighting and look-development tool Katana, whose codebase is C++/Python.
- My team is focused on improving Katana performance.

Postdoctoral researcher

UK Atomic Energy Authority

2020 – 2022

- Responsible for multiple camera systems on MAST-U, the UK's flagship tokamak experiment.
- My role covered design, operation and data analysis for operational and scientific camera systems.
- Applied techniques from computer vision, tomography and Bayesian statistics to interpret data.
- Supervised multiple successful student research projects.
- Voluntary roles included outreach at schools, New Scientist Live and organising weekly talks.
- Fellowship was jointly funded by Princeton Plasma Physics Laboratory.

Intern

Kromek

Summer 2014

- A funded internship from the Institute of Physics.
- Development and testing of a portable neutron-gamma radiation detector.

SELECTED PUBLICATIONS

1. J. S. Allcock et al. "Wavelength calibration of birefringent interferometers for 2D measurement of plasma flow" *Optics Express* Vol. 31, Issue 2, pp. 1901-1915 (2023) **(Editor's Pick)**.
2. J. S. Allcock et al. "2D measurements of plasma electron density using coherence imaging with a pixelated phase mask." *Review of Scientific Instruments* 92.7 (2021): 073506.
3. T. Long, J. S. Allcock et al. "Doppler coherence imaging of scrape-off-layer impurity flows in the HL-2A tokamak." *Review of Scientific Instruments* 91.8 (2020): 083504.
4. T. A. Wijkamp, J. S. Allcock et al. "Characterization of 2D atomic and molecular emission processes in the MAST-U super-X divertor during detachment" (*Nuclear Fusion*, accepted).
5. X. Feng et al. "Development of an 11-channel multi wavelength imaging diagnostic for divertor plasmas in MAST Upgrade." *Review of Scientific Instruments* 92.6 (2021): 063510.

EDUCATION

PhD, Physics

Durham University

2015 – 2020

- Member of the Centre for Advanced Instrumentation (CfAI) and the Fusion Centre for Doctoral Training (Fusion CDT).
- Received the 2017 University College Travel Scholarship and spent 8 months total in Eindhoven, San Diego and Chengdu.
- Presented my work in peer-reviewed journals and at international conferences.
- My thesis further developed a spectral imaging technique as a diagnostic tool in fusion experiments.
- Result #1: improved performance by incorporating a novel sensor technology.
- Result #2: developed a new calibration method, reducing calibration hardware costs tenfold

MPhys, Physics

University of York

2011 – 2015

- Grade: first class with honours.

SKILLS

- Programming (years experience):

  Python (8) | C++ (2) | Matlab (2) | Mathematica (2) | JavaScript (<1) | Fortran (<1) | IDL (<1)

- Computing:

  Latex | Git | Linux | MacOS | Windows | Adobe | Qt | CMake

- Scientific:

  optics | statistics | computer vision | data analysis | fluids | plasma | spectroscopy | inverse problems

- General:

  agile | communication | collaboration | supervision | public speaking

- Creative:

  fine art | data visualisation