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, accepted).
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 spectral imaging interferometry as a diagnostic tool in fusion experiments.
- My work improved performance by incorporating a novel sensor technology and reduced calibration hardware costs tenfold.

MPhys, Physics (1st class)

University of York

2011 – 2015

SKILLS

- Programming (years experience):

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

- Computing:

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

- Scientific:

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

- General:

agile | communication | collaboration | supervision | public speaking

- Creative:

fine art | data visualisation