Josh Borrow

Computational Astrophysicist and Data Engineer

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Education

Durham University: PhD (Computational Astrophysics): 2017-2021

Studying under the supervision of Prof. Richard Bower in the astrophysics of galaxy formation. Core member of the Virgo Consortium, EAGLE, and SWIFT teams and **led the development of a new cosmological simulation analysis pipeline** and **novel smoothed particle hydrodynamics scheme**, as well as leading papers on other topics with international collaborators.

Awarded over 100 million CPU hours in computing time (as a Co-I), £10'000 in Research Software Engineer effort (PI), £15'000 in outreach funding, and approximately £20'000 in travel funding and grants including being a participant in the highly competitive Kavli Summer Program in Astrophysics. This has led to **four first author publications, with two more to be submitted, and a seventh in preparation**, as well as over **30 talks at international venues**.

Durham University: 1st Class (Hons) MPhys: 2013-2017

Studied for an integrated masters degree. Attained grade averages of 75, 82, 73, 79 in the four years respectively. Attained an award for best level 3 poster for best (aesthetically and research quality) poster in the 'Computing Project' out of 150 students. Achieved the 'Outstanding Achievement in Physics' award twice for attaining exceptional grades in Physics modules.

Skills

Programming

Experience in using many programming languages, including **seven years python** (including full data science stack with numpy, matplotlib, pandas, scipy, etc.) experience and **three years C and MPI** experience. **Seven years git** (and GitHub) experience, with nine years LaTeX experience and **seven years experience using Tier-1 HPC facilities**.

Core developer and maintainer of several open-source libraries used for **big data analysis**, including swiftsimio and velociraptor-python. Core developer on the SWIFT cosmological simulation code.

Technical Communication

Five first author peer-reviewed publications in the scientific press, with several more soon to be submitted, have led to the development of **expert level technical writing skills**. I am also well regarded for the quality of my **conference presentations** and **scientific visualisation**, having won awards for both.

Being the core developer of a large open-source library has given me strong experience in **code documentation** writing. This also has given me experience in writing computing time proposals.

Selected Prizes, Computing Awards, and Grants

Prizes

3rd Place Libersky prize at the SPHERIC international conference (£400)

Winner, CIUK student poster competition

Computing Awards

Over 100 M Cpu/h as Co-I for various projects.

3 months dedicated RSE allocation through DiRAC for swiftsimio

Grants

£15000 STFC Spark grant for public engagement as one of two Co-Is

HPC-Europa, NORDITA, CASPEN, and KSPA travel grants

Outreach

Heavily involved in general outreach over the past seven years; developed icc.dur.ac.uk/Eagle and galaxymakers.org; presented at multiple science festivals; led school visits to the physics department; lead developer and designer on a Royal Society Summer Science Festival exhibition.