

Iraj Vaezzadeh

Curriculum Vitae

E.A. Milne Centre For Astrophysics
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Experience

Physics/Education related

- Sep 2023 - **Post-doctoral Research Assistant**, *Universität zu Köln*, Cologne, Germany.
Dec 2025
- Apr 2022 - **Part-time Physics Dept. Business Engagement Officer**, *University of Hull*, Hull, UK.
Dec 2022 This role was part of the White Rose Industrial Physics Academy (WRIPA) initiative aimed at increasing the number of physics graduates in the Yorkshire and East Midlands taking up technical employment within the region. During this role I was involved in arranging summer internships, and a data science summer school, for physics undergraduates in Hull as well as forging and strengthening the links between the physics department in Hull and local businesses.
- Jan 2022 - **Lecturer in Physics**, *University of Hull*, Hull, UK.
July 2022 Responsible for the teaching and assessment for second semester Foundation Year Physics module. This included writing and marking the main exam and resit exams for the module. The module covered topics ranging from classical physics through to modern physics including the wave theory of light, the Bohr atomic model and nuclear physics.
- 2018–2022 **Postgraduate Teaching Assistant**, *University of Hull*, Hull, UK.
Assisted in various tutorials/labs, often independently, including 1st and 2nd Year Maths, 3rd Year Python and lecturing/demonstrating at an international Astronomy/Python School. I also provided cover for lectures on electromagnetism (2nd Year) and Foundation Year Physics.
- 2016–2018 **Private Science Tutor**, West Yorkshire, UK.
Tutored GCSE students in Physics, Maths and Chemistry using bespoke progression plans tailored to pupils' goals and identified strengths/weaknesses. The role supplemented my previous teaching experience and ability to relate concepts in intelligible ways.
- 2015–2016 **School Centred Initial Teacher Training & Post Graduate Certificate in Education**, *Educate Teacher Training & Leeds Beckett University*, Caistor/Leeds, UK.
School-centred Initial Teacher Training involved working full-time in comprehensive secondary schools, whilst completing a PGCE in parallel. Working full-time whilst completing the PGCE element taught me invaluable time-management skills and how to prioritise to great effect. Working in different schools gave me great experience in quickly settling into groups of colleagues and contributing effectively to the team. Planning and delivering lessons on a daily basis also greatly improved my confidence in public speaking and staying calm under pressure.
- 2014–2015 **Volunteer Part-time A-level Physics Tutor**, *St. Mary's Sixth Form College*, Hull, UK.
Miscellaneous
- 2016–2021 **Part-time Technical Support/Procurement**, *MV Osteopathy*, Brighouse, UK.
2017 **Labourer**, *Hietalas Handelsträdgård (commercial greenhouse)*, Korva, Sweden.
- 2013–2017 **Part-time Bartender**, *Capri Wine Bar and Restaurant*, Horbury, UK.
- 2010–2011 **Volunteer Part-time Shop Assistant**, *British Heart Foundation*, Brighouse, UK.

Computer skills

PYTHON, MacOS, Windows, L^AT_EX, Linux, Office, FORTRAN, MATLAB, BASH

Education

- 2018-2023 **PhD Computational Astrophysics**, *University of Hull*, Hull.
During my PhD I worked on the effects of mergers of galaxy clusters. I used the hydrodynamic+N-body code, FLASH, to perform simulations of triple mergers to investigate the effects these mergers had on gas sloshing in the Intracluster Medium. I also completed a Postgraduate Training Scheme which included 3 Level 7 Modules entitled 'Topics in Data Science', 'Capstone: Research Topics in Astronomy', and 'The Modern Researcher'.
Supervisors Elke Rödiger & Brad Gibson
- 2015–2016 **PGCE Secondary Science Education & QTS**, *Leeds Beckett University*, Leeds.
Supervisor Roger Greenfield
- 2011–2015 **MPhys Physics with Astrophysics**, *University of Hull*, Hull.
Masters' thesis titled 'Investigating Massive Galaxy Clusters using Different Halo Mass Functions'.
Supervisors Howard Snelling & Sirichai Chongchitnan
- Miscellaneous
- 2017 **Mathematical Methods For Physics**, *Linnaeus University*, Växjö, Sweden (Remote).
Level 7 module (20 credits) on topics such as complex analysis.
- 2017 **Statistical Signal Processing**, *University of Gävle*, Gävle, Sweden (Remote).
Level 7 module (20 credits) on methods for statistical signal processing using MATLAB.

Contributions to supervision of student projects

Over the course of my PhD I aided in the supervision of several students at both undergraduate and postgraduate level, attending weekly meetings with students and assisting them with the technical aspects of their projects. As part of this role I introduced students to working with AMR simulation data and python analysis of this data. I also ran dedicated simulations of binary cluster mergers to investigate bow shocks, and shear flows to investigate Kelvin-Helmholtz instabilities. I taught several students how to compile and run the FLASH code on our local supercomputer, and how to make edits to the code. Below is a list of the project titles that I assisted in the supervision of.

- 2022- 'Effective transport of laser ablation byproducts', *PhD Project*, Jonathan Proctor.
- 2022- 'Mixing of fluids via shear flows and Kelvin-Helmholtz instabilities', *MPhys Project*, Tyler Mulligan.
- 2021 'A toy model for gas stripping from disk galaxies', *MPhys Project*, Dominic Ktori.
- 2021 'Cloud disruption by a turbulent flow', *MPhys Project*, Katie Hoan.
- 2021 'Mixing of fluids via shear flows and Kelvin-Helmholtz instabilities', *BSc Project*, Liam Somma.
- 2020 'Bow shocks in galaxy clusters', *BSc Project*, Gregory Mansfield and Jack Tinegate.
- 2020 'Observable signatures of cluster mergers', *MPhys Project*, Connor Harcourt and Peter Flexen.
- 2020- 'The limitations of Rankine-Hugoniot jump conditions for estimating infall velocity during a minor galaxy cluster merger', *MSc Project*, Tilly Huntley.
- 2019 'How to make elliptical clusters', *BSc Project*, Ben Garcia-Jones.
- 2019 'Combined gas sloshing and AGN activity in galaxy clusters', *MPhys Project*, Callum Goodship.
- 2019 'Bow shocks in galaxy clusters', *BSc Project*, Tilly Huntley.

Talks, Colloquia and Posters

- 2022 Talk: 'The Resilience of Cold Fronts to Triple Mergers' - 6th ICM Theory and Computation Workshop, Copenhagen, Denmark
- 2022 Talk: 'Galaxy Cluster Mergers' - Guest Lecture in MPhys Module 'Capstone: Research Topics in Astronomy', Hull, U.K
- 2021 Talk: 'Galaxy Cluster Gas Sloshing' - Valparaíso Jellyfishers group, Valparaíso, Chile (Remote)
- 2020 Poster: 'How does a second minor merger affect the sloshing cold fronts in a galaxy cluster?' - Royal Astronomical Society's Early Career Poster Exhibition, U.K. (Remote)
- 2019 Talk: 'Hydrodynamical Simulations in Astrophysics - A brief walkthrough' - E.A. Milne Centre Group Meeting, Hull, U.K.
- 2019 Talk: 'Introduction to Dark Matter', THAIpass 2019, Chiang Mai, Thailand

- 2019 Poster: 'The connection between triaxiality and cluster merging history' - Tracing Cosmic Evolution with Clusters of Galaxies, Sesto, Italy
- 2019 Poster: 'The connection between triaxiality and cluster merging history' - Astrophysics of Hot Plasma in Extended X-ray Sources Conference, Madrid, Spain
- 2018 Talk: 'Galaxy Cluster Mergers' - E.A. Milne Centre Group Meeting, Hull, U.K.

■ Publications

Preprint URLs available at <https://orcid.org/0000-0002-0887-1236>

1. **Iraj Vaezzadeh**, Elke Roediger, Claire Cashmore, Matthew Hunt, John ZuHone, William Forman, Christine Jones, Ralph Kraft, Paul Nulsen, Yuanyuan Su, Eugene Churazov (2022). Resilience of sloshing cold fronts against subsequent minor mergers. Monthly Notices of the Royal Astronomical Society, Volume 514, Issue 1, July 2022, Pages 518–534. DOI: [10.1093/mnras/stac784](https://doi.org/10.1093/mnras/stac784)
2. James D. Keegans, Richard J. Stancliffe, Lawrence E. Bilton, Claire R. Cashmore, Brad K. Gibson, Mikkel T. Kristensen, Thomas V. Lawson, Marco Pignatari, **Iraj Vaezzadeh**, Benoit Côté, Siri Chongchitnan (2021). Project ThaiPASS: international outreach blending astronomy and Python. Phys. Educ. 56 035001. DOI: [10.1088/1361-6552/abdae7](https://doi.org/10.1088/1361-6552/abdae7)

■ Other

- 2021- American Astronomical Society Astrophysical Journal Reviewer

■ Languages

English	Mother tongue	<i>Oral</i> ●●●●● <i>Written</i> ●●●●●
Swedish	Proficient	<i>Oral</i> ●●●○○ <i>Written</i> ●●●○○
Farsi	Basic	<i>Oral</i> ●○○○○ <i>Written</i> ●○○○○
German	Basic	<i>Oral</i> ●○○○○ <i>Written</i> ●○○○○

■ Interests

- Travel
- Quizzing
- Weight Training
- History
- Guitar
- Reading

■ References

Elke Rödiger
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Brad Gibson
Professor of Physics
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