Thomas Tomlinson

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A second-year PhD student in Astronomy. My main research focus is the dynamics of stars in the Milky Way, as well as galactic archaeology. I enjoy finding creative solutions for the problems I encounter and have an excellent work ethic.

Education

Durham University: 2023-2017
PhD in Astronomy with the topic: Dynamics of spiral galaxies to constrain the nature of dark matter

Durham University: 2019-2023
Master of Physics: class of degree: 1st

Modules included particle theory, theoretical astrophysics, and cosmology. Final year project on “Digging for the relics of ancient collisions at the heart of the Milky Way” using cosmological simulations.

Pestalozzi Gymnasium, Munich: 2011-2018
Abitur (German Certificate of General Education): 1.0 (highest grade)

Research Skills

- Programming in Python, including the use of modules such as Astropy and pandas
- Report writing using Latex
- Use of programs TOPCAT and Aladin
- Following current astrophysical literature
- Interpretation and analysis of data from astronomical observations
- Working with complex astrophysical models

Research Experience

Master's project: "Digging for the relics of ancient collisions at the heart of the Milky Way"
Durham University [03/10/2022 – Current]

- Aim is to determine possible ways of detecting traces of early mergers in the Milky Way.
- This is done using Auriga simulations, which are part of the Virgo Consortium, to study the dynamics at the centre of halos similar to the Milky Way.
- By studying the dynamics at the centre in addition to the chemical composition of the stars, I am investigating if it is possible to pick up structures that were formed by early accretion events.
- Included extensive reading on galactic dynamics; had to find solutions to problems and challenges encountered in computational physics.

Summer Internship: An X-ray variability study
Max Planck Institute for Extraterrestrial Physics [11/07/2022 – 12/09/2022]

- Conducted a variability study of X-ray sources in the catalogues of the eFEDS and eRASS1 surveys of the eROSITA X-ray telescope, with the two surveys having been conducted several months apart.
- Used Python to compare the count rates of sources in both catalogues by computing their upper and lower limits.
- Resulted in a preliminary classification of sources by the likelihood of their variability, using Poisson statistics among other methods.
- Gained experience in analysing data from astronomical observations.

Computing Project on Quarkonium
Durham University [04/10/2021 – 18/03/2022]

- Studied the energy levels of quarkonium, the bound state between a quark and its anti-quark, using computational methods written in Python.
- Methodology included using a bisection method to find the energies of the wave functions describing the system; the results of my calculations were then compared to experimental results.
- Further studied how well different potentials describe the system and calculated the spin fine splitting in quarkonium.

Positions of Responsibility at Student Societies

Photography Editor
Palatinate - Durham University's Student Newspaper [12/09/2021 – Current]

- Curated a stock of images for use by the newspaper.
- Covered newsworthy events around Durham e.g., protests, strikes, art installations.
- Participated in bi-weekly editorial board meetings and aided in the distribution of the newspaper, which has a circulation of around 3000 copies every two weeks.

Secretary
Durham University Audio Drama Society [28/09/2020 – 24/06/2021]

- Managed most of the correspondence of the society.
- Co-produced 'The Three Musketeers', an audio drama with a cast of over 20 people, which ran for 20
- episodes.
- Ran several workshops for on creating audio dramas for newcomers.

Hobbies and Interests

- Have been playing the French horn for 13 years now and have been a member of several orchestras each year at university, each performing multiple concerts per year, once as soloist playing a horn concerto.
- Have taken photos for several theatre productions and at events and have a passion for landscape photography.