Christian Kirkham _{FRAS} – Curriculum Vitae

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Education

- **Durham University, Physics with Astronomy (MPhys)** *2018 to 2022*
  Expected grade: First
  First-, Second- and Third-year averages: 78.8%, 71.3%, 72.5%

- **Ruthin School** *2012 to 2018*
  4 A-levels: Physics (A*), Chemistry (A), Mathematics (A*), Further Mathematics (A*)

Achievements

- **Durham Physics Award for Outstanding Achievement** *Jun 2019*

Technical Experience

- **LaTeX**
  Intermediate
- **Linux**
  Intermediate
- **Git**
  Intermediate

- **Python**
  Advanced, around 8 years' experience
- **HTML, CSS and JavaScript**
  Intermediate
- **SQL/ADQL**
  Beginner

Employment

- **"Developing a remote operation mode for the TARA Radio Telescopes"**
  Durham University, Sep 2021
  Created a tkinter UI to allow both Durham physics students and the general public to operate the 5m TARA Radio Telescope which has been installed at Kielder Observatory. By taking the position of the radio telescope, the program uses DSS and HI4PI survey data to provide immediate information to the user to explain at an accessible level what they should expect to see.

Projects

- **"The Gaia and HST Cepheid scales and the tension in Hubble's Constant"** *2021/22*
  Master's Project: Involves investigating the tension in Hubble's Constant by examining systematic errors in parallax measurements from Gaia EDR3. Determining the zero-point of Cepheid parallaxes will allow the tension to be constrained. This requires use of Python and ADQL to handle and analyse large datasets of over 100,000 stars.

- **"Modelling the Spectrum of Sagittarius A*"** *2020/21*
  Used Python and a variety of numerical methods, such as interpolation and numerical integration, to model the X-ray emission spectrum of a supermassive black hole's accretion disc. Fitting the model to observational data with chi-squared minimisation allowed the mass of Sgr A* to be estimated to within an order of magnitude.

- **"A Method for Using Automated Sky Surveys to Investigate the Blazhko Effect"** *2020/21*
  Observed the RR Lyrae variable stars AH Cam and FM Per to determine their Blazhko periods. Comparing this to ASAS-SN data allow me to test a method for quantifying the Blazhko effect using general time-domain all-sky surveys. This provided experience of observational astronomy and the use of Fourier methods to analyse time series data.

- **"Investigating the Cause of Betelgeuse's Unprecedented Dimming"** *Feb 2020*
  Observed the light curve of Betelgeuse in V-band and B-band during its period of unexplained dimming in early 2020 to attempt to determine a likely cause. This required knowledge of aperture photometry and provided experience of performing a research-led investigation.

Publications

- **"Why Science Reporting Needs to Change"** *Jun 2020*
  The Durham Scientist
  https://www.durhamscientist.com/post/why-science-reporting-needs-to-change

Extracurricular Activities

- **Durham University Astronomical Society**
  - *President (2021/22)*. This role involves running the society and supporting the six exec members in their roles. After COVID-19 had taken its toll on group activities, it is the president's job to revive interest in the society by organising social events, academic talks, stargazing events and day trips. Requires leadership skills and public engagement with astronomy.

  - *Astrophotography Officer (2020/21)*. This involved taking photos of astronomical objects and producing weekly stargazing guides for society members. The role required the ability to coordinate with executive committee members.

- **"Study Buddy" Scheme** *2020 to 2022*
  I am acting as a "study buddy" or tutor, providing academic advice and explaining the more difficult concepts to two second-year physics students. This requires science communication skills and a good understanding of the course material.