

Dr. A. Fraser Gillan

Curriculum Vitae

Observational astronomy, wide-field surveys, cometary activity, photometry

✉ agillan05@qub.ac.uk
ORCID: [0000-0003-4094-9408](https://orcid.org/0000-0003-4094-9408)

Education & academic experience

Oct 2021– **PhD in Astrophysics**, Queen's University Belfast.

Dec 2024 PhD thesis: *Activity in Jupiter-family Comets and Asteroids: Photometric Analysis of Survey and Deep Imaging*
Supervisors: Prof. Alan Fitzsimmons & Dr. Megan Schwamb

Oct 2019– **MSc by Research in Astrophysics**, University of Central Lancashire.

Sept 2020 MSc thesis: *Automatic detection of solar system objects in NASA's STEREO data*
Supervisors: Dr. Daniel Brown & Dr Mark Norris

Sept 2015– **BSc in Astrophysics**, University of Central Lancashire.

May 2019 BSc thesis: *Calculating the orbits and properties of near-Earth asteroids using MHT data*
Supervisors: Dr. Jason Kirk & Dr Mark Norris

Publications

First Author:

- *Dust production rates in Jupiter-family Comets: A two-year study with ATLAS photometry*
A. Fraser Gillan, A. Fitzsimmons, L. Denneau, R. J. Siverd, K. W. Smith, J. L. Tonry, D. R. Young
(A. Fraser Gillan et al 2024 Planet. Sci. J. 5 25)
- *Dust production rates in Jupiter-family Comets II: Trends and population insights from ATLAS photometry of 116 JFCs*
A. Fraser Gillan, A. Fitzsimmons, L. Denneau, R. J. Siverd, K. W. Smith, J. L. Tonry,
in review
- *On the border: Searching for cometary activity near the Centaur-JFC transition line*
A. Fraser Gillan, A. Fitzsimmons, C. Chandler, C. Snodgrass
in preparation

Co-author:

- *Quasi-periodic X-ray eruptions years after a nearby tidal disruption event*
M. Nicholl, D. R. Pasham, A. Mummery, M. Guolo, ... **A. F. Gillan**
Contribution - I analysed the Hubble Space Telescope PSF.
Nature 634, 804–808 (2024)

Conferences, seminars and talks

- March 2025 **Co-authored talk**, “Photometric monitoring of 29P/Schwassmann-Wachmann 1 outbursts in December 2024” Lunar and Planetary Science Conference, The Woodlands, TX/Virtual.
J.M. Trigo-Rodríguez, Enrique Herrero and **A. Fraser Gillan**
- Nov 2024 **Contributed talk**, “Dust production rates in Jupiter-family comets: Trends and population insights from ATLAS photometry of 116 JFCs” Astro/Space Seminar Series, The University of Kansas, Virtual, KS, USA.
- Dec 2023 **Contributed talk**, “Dust production rates in Jupiter-family comets: A two year study with ATLAS photometry”, Halfway for Halley: Current and future horizons in cometary science, The Royal Astronomical Society, London, U.K.
- Dec 2023 **Contributed talk**, “Dust production rates in Jupiter-family comets: A two year study with ATLAS photometry”, QUB Seminar Series, Queen's University Belfast, U.K.
- June 2023 **Contributed talk**, *Dust production rates in Jupiter-family comets: A two-year study with ATLAS Photometry*, Asteroids, Comets, Meteors, Northern Arizona University, Flagstaff, AZ, USA.
- Feb 2023 **Contributed talk**, “Dust production rates in Jupiter-family comets: A two year study with ATLAS photometry”, QUB Seminar Series, Queen's University Belfast, U.K.
- July 2022 **Contributed poster**, “Photometry of active Jupiter-family comets with ATLAS”, National Astronomy Meeting 2022, University of Warwick, U.K.

- May 2022 **Contributed talk**, “*Photometry of active Jupiter-family comets with ATLAS*”, ATLAS Science Team Meeting, Queen’s University Belfast, U.K.
- Aug 2021 **STFC Summer School**, *E. A. Milne Centre for Astrophysics, University of Hull, U.K.*

Observing

- Nov 2022 **Isaac Newton Telescope**, *Roque de los Muchachos Observatory, La Palma, Spain*.
Conducted observations for three nights on the 2.5m Telescope in La Palma.
- 2017 – **Moses Holden Telescope**, *Alston Observatory, Longridge, Preston, U.K.*
- 2019 Regular use of the 0.7m MHT telescope over several years, developing a substantial and in-depth familiarity with its instrumentation and observational capabilities.

Teaching & demonstrating

- 2021 – **Observing demonstrating**, *Queen’s University Belfast, Belfast, U.K.*
- 2024 Assisting undergraduate students using smaller telescopes with their first observing experiences. I provided hands-on assistance, guidance, and support to ensure a positive and educational introduction to observational astronomy for the students.
- 2023 **Solar observation demonstrating**, *Queen’s University Belfast, Belfast, U.K.*
Assisted undergraduate students working on Solar physics projects. I provided guidance on the use of CCDs, instructed students in utilising various image analysis software, and supported them in the analysis of solar data.
- 2023 **Mathematics for Scientists and Engineers**, *Queen’s University Belfast, Belfast, U.K.*
Responsibilities included assessing weekly assignments, offering constructive feedback on various mathematical concepts, and leading tutorial groups. I conducted weekly tutorial sessions focused on reviewing the solutions, teaching the mathematical concepts, and preparing the students for their upcoming exams.
- 2022 – **Computational Methods demonstrating**, *Queen’s University Belfast, Belfast, U.K.*
- 2023 I helped teach first-year undergraduate students, many of whom had no prior coding experience, in the fundamentals of Python programming. This instructional role encompassed teaching coding skills, effective script layout, code optimisation techniques, and troubleshooting strategies to develop their proficiency with Python.
- 2018 **Observing demonstrating**, *Alston Observatory, Longridge, Preston, U.K.*
Hands-on observing demonstrations for undergraduate students. I guided students through the process of analysing telescope data, conducting photometry, and facilitated discussions to enhance their understanding and interpretation of results.

Outreach & science communication

- April 2023 **Outreach talk**, “*Comets: Icy Messengers from the Edge of the solar system*”, Irish Astronomical Association meeting, Queen’s University Belfast, Belfast, U.K.
- Feb 2023 **Outreach talk: “Comets: Icy Messengers from the Edge of the solar system”**, *Northern Ireland Science Festival Astronomy Day, Queen’s University Belfast, Belfast, U.K.*
- 2019 – **Various lectures and telescope tours**, *Alston Observatory, Longridge, Preston, U.K.*
- 2020
- Oct 2019 **Public communication**, *Lightpool Festival SUN exhibit, Blackpool, U.K.*
- June 2019 **Public observing days/nights**, *University of Central Lancashire, Cyprus campus, Cyprus.*

Scholarships and awards

- May 2023 **Emily Sarah Montgomery Travel Scholarship**, *Queen’s University Belfast*.
£400 for travel to present our work at Asteroids, Comets, Meteors (ACM) 2023 in Flagstaff, AZ, USA
- May 2023 **Royal Astronomical Society conference travel grant**, *Royal Astronomical Society*.
£764 for travel to present our work at Asteroids, Comets, Meteors (ACM) 2023 in Flagstaff, AZ, USA

Training and Workshops

- Sept 2024 **LSST Solar System Readiness Sprint**, *University of Oxford, U.K.*
- Feb 2024 **Rubin Science Platform Workshop**, *Queen’s University Belfast, U.K.*

Affiliations

Member of the Institute of Physics (**IOP**); Fellow of the Royal Astronomical Society (**RAS**); Member of the LSST Solar System Science Collaboration (LSST SSSC); LSST:UK Junior Associate w/LSST data rights (**LSST UK JA**)