STORM COLLOMS

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EDUCATION

University of Glasgow, PhD Student **Oct 2022-Current**

- Understanding the Populations of Compact Objects with Gravitational Wave Detections and Machine Learning
- Supervisors: Christopher Berry and John Veitch
- Funded by the University of Glasgow (STFC scholarship)

University of Edinburgh, MPhys in Astrophysics (first class) **Sept 2017-May 2022**

- Master's Thesis: Modelling Quasar Variability with Shot Noise
- Key modules: General Relativity, Stellar Evolution, Astrophysics, Radiation Processes in Astrophysics, multiple courses using Python.
- Completed a year abroad at Waseda University 2019-2020 (Tokyo, Japan).

Hyndland Secondary School **Aug 2011-June 2017**

- 3 Advanced Highers at grade A, 6 Highers at grade A

RESEARCH EXPERIENCE

LIGO SURF 2021: Searching for Sub-threshold Lensed Gravitational Waves **June-Aug 2021**
California University of Technology
Supervisors: Prof Alan Weinstein and Alvin Li

- Refined the GstLAL search pipeline for sub-threshold lensed gravitational waves, introducing a modification to target the search according to the sky location of a super-threshold target event.
- Results need tested against simulated lensed events to ensure the modification effectively boosts the ranking of lensed images.
- Delivered regular presentations and wrote interim and final reports, while learning about other areas of gravitational wave physics and astrophysics in weekly talks and through my fellow interns' projects.

MPhys Project: The Statistical Nature of Quasar Variability **Sept 2021-April 2022**
Supervisor: Prof Andy Lawrence

- Simulated statistical models of optical quasar variability using shot noise to compare with UV/optical data and constrain the statistical parameters of the noise.
- Demonstrated a strong case for multiple timescales present in the data, constraining physical explanations for the variability.

Senior Honours Project: Searching for a Planetary Mass Object Companion Jan-Apr 2021
Supervisor: Prof Beth Biller

- Photometrically analysed HST and Keck telescope data to determine if a candidate planetary-mass object was a true companion to a known brown dwarf.
- Supplemented photometric analysis with astrometry across the two epochs, as well as a discussion of the spectral fit of the data.

- Found that the candidate companion was not likely to be a true brown dwarf companion, due to its bluer colour despite being comparatively dimmer than the primary brown dwarf, as well as unaligned proper motion.

Group Project: Determining the Properties of a Transiting Exoplanet Sept 2020-Feb 2021
Supervisors: Prof Philip Best and Dr Colin Snodgrass

- Observed the planetary transit of HAT-P 32b using the PIRATE robotic telescope in order to to fit a light curve with MCMC methods and perform spectral analysis to determine the properties of the system.
- Supplementing this to with analysis of radial-velocity data, the planetary mass, period, inclination angle, semi-major axis and eccentricity to within 1 sigma, agreeing with the literature that this was a Hot Jupiter type planet.
- Prioritised tasks in a group setting and took initiative to set goals and keep the project on schedule.

UTRIP: The Effect of Planet-Planet Tides on 2-planet Scattering Events June-Aug 2019 University of Tokyo
Supervisors: Prof Michiko Fujii and Dr Alessandro Alberto Trani

- Simulated n-body systems to investigate the impact of tidal forces between 2 Jupiter-sized planets on the formation of the planetary system, to see if this could have an effect on the observed high proportion of Hot-Jupiter planets.
- Analysed the results and found that the planet-planet tidal forces resulted in significantly more collisions, meaning that these forces could have a significant effect on the outcome of planet-planet scattering events.

PUBLICATIONS

Coming Soon...

TEACHING

Graduate Student Demonstrator, University of Glasgow

- Exploring the Cosmos 2022-23, 1st year lecture class. Technical facilitation and answering questions at the end of lecture in overflow lecture theatre.

CONFERENCES

Attended

- LGBTQ+ in STEM Community and Careers Conference, 18th November 2022
- SUPA Cormack Meeting 17th December 2022
- WiSTEM 2019, Oxford

AFFLIATIONS

- Institute of Physics, associate member
- LIGO-Virgo-KAGRA (LVK) Collaboration member since 2021

OTHER SKILLS

Programming Skills	Python (numpy, pandas, bilby, matplotlib), Git, HTML, CSS
Software	DS9, IRAF, GAIA
Operating Systems	Windows and Linux
Languages	English (native), Japanese (conversational), several words in many others

AWARDS

UKSEDS Diversity & Inclusion Champion of the Year 2019

Pre-Honours Certificate of Merit 2017 and 2018

Hyndland Secondary School Dux 2016

PUBLIC AND ACADEMIC ENGAGEMENT

Astrobites Author (2023-Present) astrobites.org

- Writer and Editor of astorphysics paper summaries at undergraduate level.

Illustrator for LIGO magazine (2023-Present)

Curator of Humans of LIGO (2023-Present)

Co-leader of School of Physics and Astronomy's LGBTQ+ network, 2021-2022

- Organised fortnightly lunches.
- Set up and moderated an online community chat to create a welcoming community environment.

Edinburgh University Women in STEM Society, Physics Representative 2018/19

- Hosted a series of academic talks, promoting the work of female physicists at Edinburgh.
- Worked as part of a larger committee to host a 24-hour hackathon, encouraging the participation of STEM students with little to no coding experience.