Zoe Le Conte

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EDUCATION

PhD. at the Centre for Extra-galactic Astronomy (CEA) Durham, England | Sep 2022 - expected Mar 2026
Durham University

MPhys. Astrophysics with a Year Abroad Southampton, England | Sep 2018 - Jul 2022
University of Southampton | Flagship program for top five performing students

Advanced Level. Mathematics, Physics, Government and Politics, Art Kent, England | Sep 2016 - Jul 2018
Bexley Grammar School

GCSE. 12 A*-B Grades Kent, England | Sep 2011 - Jul 2016
Bexley Grammar School

WORK EXPERIENCE

DURHAM UNIVERSITY | Undergraduate Modules Demonstrator Durham, England | Oct 2022 - present

- Demonstrate the stars and galaxies level 2 undergraduate workshops by working through physics problem sheets with individuals and groups of students.
- Run interactive group workshop sessions based on student feedback and adapt the work style to support wider and more engaged participation.
- Run revision sessions for students with resits and provide one-to-one support in-person and online.
- Promptly mark midterm exams.
- Currently working towards the Gateway to Academic Practice programme.

DURHAM UNIVERSITY | Postgraduate Ambassador Durham, England | Oct 2022 - present

- Advised and informed prospective students about the Durham Physics & Astronomy department. I have a passion for the physics and astronomy community.
- Networked and developed communication skills with various faculty members. Displayed effective teamwork in a highly pressurised environment.
- Problem solving was needed for unexpected circumstances whilst ensuring minimal disruption to the functioning of the event.
- Accountable for large groups of people.

MYTUTOR | Tutor England | Sep 2022 - Sep 2023

- Provide online resources and effectively teach this to students via an inline platform.
- Be on a highly flexible schedule to cover school lessons.
- Teach maths and science lessons to a broad range of school-aged students.
- Critically reflect upon my teaching practices to best suit the diversity of the student groups.

CENTER FOR ASTROPHYSICS | **HARVARD & SMITHSONIAN** | Research Fellowship MA, US | Sep 2021 – Jun 2022

- Conducted a lunar far-side preliminary site survey to deploy radio arrays.
- Learnt C++ programming language **Generic Mapping Tools** (a planetary surface data analysis package to produce illustrations), and combined with knowledge of **Python** to improve terrain mapping techniques.
- Captained this project, developing highly independent problem-solving skills and initiative.
- Attended and participated in **CfA-MIT Journal Club**. Discuss and present current research projects undertaken by pre-doctoral students.
- Presented a poster at the HEAD19 meeting of the **American Astronomical Society**, Mar 2022, Pittsburgh, PA.
- Presented a talk in the Center for Astrophysics **High Energy Seminar**.

UNIVERSITY OF SOUTHAMPTON | Physics Ambassador Southampton, England | Jul 2019 – Jul 2021

- Advised and informed prospective students about the Southampton Physics & Astronomy department. I required a passion for the physics and astronomy community, with independent study of the department and current news.

- Networked and developed communication skills with various faculty members. Displayed effective teamwork in a highly pressurised environment.
- Problem solving was needed for unexpected circumstances whilst ensuring minimal disruption to the functioning of the event.
- Accountable for large groups of people.

AWARDS

Durham University, Deprtment of Physics, Ella Bryant Award Dec 2023
Durham Researcher Development Award: Stage 1 Sep 2023
2^{nd} **Place in the Best Poster in the Faculty of Science Award** Sep 2023
1^{st} **Place in the DCAD Research Poster Competition 2023** Jun 2023
University of Southampton flagship program: Center for Astrophysics | Harvard & Smithsonian visiting researcher Aug 2020
University of Southampton design and observation in astronomy module Dec 2019

SKILLS

Languages: Python, C++: Generic Mapping Tools package, LaTeX, Microsoft Office
Soft: Public speaking, teamwork, time management, technical writing, statistical thinking, critical thinking, adaptability, organizational

CONFERENCES & MEMBERSHIPS

Durham-Edinburgh eXtragalactic (DEX) Workshop XX Talk | Jan 2024
Galactic Bars: Driving and Decoding Galaxy Evolution Talk | Jul 2023
Crayford Manor House Astronomical Society Dartford Lecture | Apr 2023
The Royal Society (RS), Astronomy from the Moon: the next decades Poster | Feb 2023
Durham-Edinburgh eXtragalactic (DEX) Workshop XIX Talk | Jan 2023
UKRI STFC Summer School Attendee | Aug 2022
American Astronomical Society (AAS), High Energy Astrophysics Division meeting #19 Poster | Mar 2022
American Astronomical Society (AAS) Undergraduate Member | 2021 - 2022
Space Generation Advisory Council Member | 2021 - 2022
Supernova Foundation Member | 2020 - 2022
Institute of Physics (IoP), SEP-net: Taking Control of Your Career as a Woman in Physics Attendee | 2021
Conference for Undergraduate Women in Physics (CUWiP) Attendee | 2021
Institute of Physics (IoP), SEP-net: Taking Control of Your Career as a Woman in Physics Attendee | 2020

VOLUNTEERING IN STEM

Astro Journal Club Co-Chair Postgraduate journal club | Oct 2023 - present
CommuniTEA Co-Founder Departmental social event | Jun 2023 - present
CEA Student Representative Departmental representative | Jan 2023 - present
Astronomy Girls Day Durham Team member | Dec 2022 - present
Planetarium Talks Presenting 'The Northern Sky' planetarium shows to schools and communities | Oct 2022 - present
Astronomy Outreach Volunteer On panels, gave talks and demonstrated experiments at events | Oct 2022 - present

RESEARCH PROJECTS

LUNAR FAR-SIDE RADIO ARRAYS: A PRELIMINARY SITE SURVEY Python, Generic Mapping Tools, Digital Terrain Mapping | Jun 2022

Captained a project that created a digital terrain mapping algorithm, obtaining elevation, slope, and roughness parameters of several preliminary Moon sites. A Python algorithm to analyse location accessibility for wheeled vehicles and determine the optimum site for a 200 km radio array. This interferometer will measure signals from the Dark Ages and constrain cosmological parameters. Supervised by Dr Martin Elvis and in collaboration with Dr Philipp Gläser, our paper is published in RASTI: 10.1093/rasti/rzad022.

TIMING ANALYSIS OF ACCRETING OBJECTS Python, Fourier Analysis | Jun 2021

Construction of light curves and power spectrums of several accreting objects through Fourier analysis is derived and

presented. This algorithm is evaluated against two known objects archival data, then utilised to classify unidentified accreting objects from the X-ray timing data from the $NICER$ experiment on the $International Space Station$ archival data. These objects range from magnetars to black hole binaries. Supervised by Diego Altamirano.

CIRCUMBINARY PLANETS PECULIAR ORBITS Python, Computer Simulations | Apr 2021

A circumbinary planet's trajectory and motion is observed in a two-dimensional computer simulation. The varying of parameters identifies the boundary and initial conditions of a three body system which displays peculiarities. Additionally, I conclude that these systems presented chaotic orbits with no analytical solution. High dependence between initial conditions and unstable orbits are observed, implying an explanation for their rarity. Supervised by Diego Altamirano.

HARD X-RAY SURVEYING TELESCOPE: THE POPULATION OF LOW FLUX HIGH MASS X-RAY INARIES

Telescope Instrumentation Design | May 2020

Designed HXST; an all sky hard x-ray surveying telescope, imaging in the 15-100 KeV energy range, and performing spectroscopy with a 1.7KeV spectral resolution. Its main features included coded aperture imaging; a semiconductor diode detector made of CdTe with the detector plane consisting of 25,281 pixels; a graded shield and plastic scintillator and photomultiplier. Its primary mission is to collect information on faint high mass x-ray binaries, and increase the completeness of the catalogues produced by $INTEGRAL$ and reviews by $NuSTAR$. Supervised by Tong Bird.

OBSERVATIONAL PROJECTS

BARRED GALAXY DYNAMICS Isaac Newton Telescope | Mar 2024

Ongoing project. I obtained spectroscopic data of three barred galaxies with the slit aligned parallel and perpendicular to the bar. The data is reduced using PypeIt and I aim to analyse and compare the dynamical structure of these barred galaxies. I will compare my results to unbarred galaxies with MUSE data and try to answer the question why do not all galaxies form a bar?

CATACLYSMIC VARIABLES Teide Observatory | Apr 2021

An accelerated week long project in which I observed the cataclysmic variable (CV) targets IY UMa, AR Uma, and ASSASN-14ag remotely using the Teide Observatory. Using photometry, light curves in the V band were produced in the period of 6th - 7th May 2020; luminosity-mass relation determined their mass and eclipse periods measured; scrutinised against each system's pre-measured results. Expanding on this initial idea a comparison of CVs to an observed white dwarf eclipsing binary was drawn. The research was presented and assessed in a conference. Supervised by Christian Knigge.

REFEREES

Joanne Lakey
Senior PGR Administrator Physics
Durham University
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Amelia Dodd
Student Recruitment Coordinator
Durham University
pg.ambassador@durham.ac.uk

Dr Dimitri Gadotti
Assistant Professor
Durham University
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