DOMINIC TAYLOR | CV

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PROFESSIONAL SUMMARY

Doctoral researcher in Astrophysics at Durham University with strong Python expertise, experienced in building scalable data workflows, applying advanced statistical methods, and managing code with Git. Skilled at communicating technical ideas to diverse audiences, currently expanding into SQL and machine learning, and seeking roles in data science, machine learning, or technology consulting.

EDUCATION

PhD Astrophysics | Durham University | Durham, UK (10/2022 – 03/2026)
Thesis title: Galaxy evolution through gas kinematics of submillimetre galaxies and changing-look AGN
Supervisor: Prof. Mark Swinbank

MPhys Astrophysics | University of Liverpool | Liverpool, UK (09/2017 – 06/2021)
Grade: Class I
Thesis title: What influences the physical processes of galaxy formation?

SKILLS

Programming

Python: Extensive experience in statistical analysis, modelling, and visualization of observational and simulation data, using libraries such as Pandas, Matplotlib, NumPy, SciPy, Astropy, Streamlit, TensorFlow, and Keras.
C/Bash: Skilled in navigating the Linux operating system and executing scripts via the Ubuntu terminal.
JavaScript: Applied in building a user-friendly website for myself and for an independent company, focusing on interactive features and clear design.
HTML: Proficient in designing and developing personal and industry-focused websites.
MATLAB: Used for data-driven modeling and analytics.
Git: For version control in collaborative and shared projects.
LaTeX: Applied for producing journal articles, academic documentation, and formatting research results.
Microsoft Teams/Word/Excel/Powerpoint: Proficient in hosting virtual meetings, preparing reports, analyzing data, and delivering project presentations.

Organisational

Public speaking: Comfortable presenting research work clearly and articulating ideas to large international audiences, including those without expertise in the subject.
Independent learning: Proactively explore methods to achieve objectives, applying intuition to improve in areas such as career development, health, and relationships.
Group work: Effective communication and collaboration within research groups, offering support and guidance while recognising the invaluable benefits of peer input.

Languages

English (Native), Spanish (Conversational), Italian (Conversational), French (Beginner)

KEY PROJECTS & WORK EXPERIENCE

Peer-reviewed journal publications

- Two first-author peer-reviewed journal publications.
- One first-author publication submitted and under review.
- Two co-author peer-reviewed journal publications.
- Two additional journal papers in preparation.

Observational survey leadership

- Led a major observational project using the KMOS instrument on the Very Large Telescope (VLT), equivalent to ∼£1.3M of telescope time (250 hours awarded).
- Conducted a follow-up analysis of Atacama Large Millimeter/submillimeter Array (ALMA) observations, equivalent to ∼£100k of telescope time (10.1 hours awarded).
- Delivered new insights into galaxy evolution using one of the largest near-infrared integral-field spectroscopy datasets available.

Large-scale data reduction pipeline engineering

- Built scalable data pipelines to process terabytes of astronomical data.
- Improved performance and ensured full reproducibility.

Website Development for TutorMia Language Tutoring

- Designed and developed a responsive website for an independent language tutoring company (TutorMia), improving user experience and functionality.
- Implemented interactive features and clear navigation, contributing to a 200% increase in client attraction.

- Maintained and updated the site using best practices in web development, ensuring long-term usability and performance.

Public data access code

- Developed "eso_download", user-friendly Python tool for automated data retrieval from the European Southern Observatory (ESO) Science Archive.
- Maintained with version control through Git and publicly released.

Spectral analysis software

- Developed "kmos_specfit", a Python package used by multiple researchers to model multi-component emission lines in astronomical spectra.
- Maintained and version-controlled with Git.

Public COVID Data Application

- Developed a publicly accessible Streamlit application (COVID-19) visualising COVID-19 data during the pandemic, including cases, deaths, and tests for all countries.
- Enabled interactive comparisons between countries and time periods, helping users explore trends and patterns efficiently.
- Designed for usability and clarity, with scalable code allowing for automated updates from public datasets.

Collaboration and independent initiative

- Independently organised a two-month research internship at the Leibniz Institute for Astrophysics Potsdam (AIP), Germany.
- Identified an under-represented galaxy population through cross-matching of large survey datasets, with results expected to shape future studies.

DATA TRAINING COURSES

Google Machine Learning Crash Course | Ongoing (05/2025 – Now)
Introductory course by Google providing hands-on experience with fundamental machine learning concepts, including supervised learning, neural networks, and TensorFlow applications, with certificate on completion.

Kaggle Intro to SQL Course | Online | Ongoing (05/2025 – Now)
Intro to SQL course to develop skills in querying relational databases, including filtering, sorting, and aggregating data, as well as mastering complex joins and subqueries for effective data analysis.

MIT Open Learning Library Introduction to Machine Learning Course | Online | Ongoing (03/2025 – Now)
Introduction to Machine Learning online course by MIT, to learn foundational components of ML, such as linear classifiers, regression, neural networks, and CNNs.

AI Alignment & Engineering Course | Durham University, UK (10/2024 – 12/2024)
Alignment Research Engineering Accelerator (ARENA) course for upskilling in ML, with topics including and intro to PyTorch and Deep Learning, building transformers, attention mechanism, and mechanistic interpretability with SAEs.

Bayesian Statistics Workshop | Imperial Centre for Inference and Cosmology (ICIC) | London, UK (10/2023)
Condensed, workshop on Bayesian statistics, where I quickly developed practical skills and applied knowledge in Bayesian inference.

COMMUNICATION & OUTREACH

- Delivered multiple international conference talks to large audiences ($\sim$ 300 attendees), including presentations on galaxy evolution (e.g. Italy 2024, 2025).
- Regular outreach contributor: presented astronomy to audiences from schools to the general public, reaching hundreds of participants.

LEADERSHIP & VOLUNTEERING

University College Men's Football Captain | Durham University | Durham, UK (09/2023 – Now)

- Manage treasury duties for a club of $\sim$ 50 members, and organise and lead training sessions, matches, and events.

Isaac Newton Telescope operator | Roque de Los Muchachos Observatory | La Palma, Spain (06/2023)

- Independently operated the Isaac Newton Telescope at the Roque de Los Muchachos Observatory.
- Responsible for collecting astronomical data to be used by another researcher in their doctoral studies.

PhD Journal Club Chair | Centre for Extragalactic Astronomy | Durham University (09/2023 – 09/2024)

- Organised and chaired a journal club for PhD students, facilitating discussions on recently published articles through presentations by members in each session.

HOBBIES & INTERESTS

I enjoy keeping fit through regular gym training and competitive football, which helps me stay disciplined and thrive in team environments. I also value reading and time offline as a way to recharge and maintain consistent performance.