

Jack William Tweddle

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1st Year DPhil Student in Astrophysics, University of Oxford, UK

PRIMARY RESEARCH INTERESTS

- Constraining dark energy and cosmic expansion with Type Ia supernovae (SNe Ia) across redshift;
- Constructing a low-redshift SN Ia sample from the ATLAS survey to anchor future cosmological surveys like LSST;
- Improving SN Ia standardisation through host galaxy-informed models and population trends;
- Investigating the astrophysical drivers of host-SN correlations through morphological and stellar population analyses

EDUCATION & RESEARCH

- **University of Oxford, St. John's College** October 2024 - Present
Oxford, UK
DPhil Astrophysics
 - **DPhil Thesis:** Supernovae and Cosmology with the Rubin Observatory's Legacy Survey of Space and Time
Supervisors: Prof. Stephen Smartt & Prof. Maria Vincenzi
- **University of Bath** September 2019 - July 2024
Bath, UK
MPhys (Hons) Physics with Astrophysics with Professional Placement
 - **First class** with overall weighted programme average of **91.22%**
 - **MPhys Thesis:** Modelling gamma-ray burst afterglow emission up to TeV energies
Supervisor: Dr. Hendrik van Eerten
Grade: First class (88%)
 - Awarded Chancellor's Prize (awarded to the best final year undergraduate student across all degree programmes) and Ayliffe Prize (awarded for outstanding achievement during the final year of the Physics or Mathematics and Physics degree)
- **University of Bath** August 2023 - October 2023
Bath, UK
Summer Research Intern
 - Bayesian constraints on exotic core models of neutron stars using simulated observables
Supervisor: Dr. David Tsang
- **ISIS Pulsed Neutron and Muon Source** July 2021 - August 2022
Didcot, UK
Nuclear Analyst
 - Simulating pulsed neutron die-away experiments to validate neutron transport codes and scattering models

PUBLICATIONS

P=PUBLISHED, I=IN PREPARATION

- [I.1] Tweddle, J. W. et al. (in prep.), *Simulations of the ATLAS Low-Redshift Type Ia Supernova Sample*
- [I.2] Tweddle, J. W. et al. (in prep.), *Host Galaxy Properties of the ATLAS Type Ia Supernova Sample*
- [I.3] Murakami, Y. S., Tweddle, J. W. et al. (in prep.), *Study of Type Ia Supernova Lightcurve Fits in the ATLAS Survey*
- [I.4] Hitchen, D., Tweddle, J. W. et al. (in prep.), *Afterglow emission from explosive transients up to very high energies: Scaling relations for synchrotron self-Compton spectral features*
- [I.5] Marlin, E. G., Murakami, Y. S., Tweddle, J. W. et al. (in prep.), *ATLAS Calibration Consistency and Estimate of Systematic Uncertainties*

TEACHING

- **University of Oxford** October 2025 - Present
Oxford, UK
Course Tutor, 4th Year Astrophysics
 - Deliver tutorials and assess problem sheet solutions for advanced astrophysics modules, including Cosmology, Stellar and Galactic Astrophysics, Radiative Processes, and High-Energy Astrophysics
 - Provide detailed feedback and guidance to strengthen students' analytical and mathematical skills
- **University of Oxford** October 2025 - Present
Oxford, UK
Laboratory Demonstrator, 3rd Year Astrophysics
 - Supervise and support undergraduate students in practical astrophysics experiments
 - Provide technical and conceptual assistance with observational techniques, error analysis, and scientific reporting

- Mark laboratory reports and deliver constructive feedback to support students' technical accuracy and scientific development

• **MyTutor [🌐]**

A Level and GCSE Tutor - Physics, Mathematics and Further Mathematics

- Over 400 hours of lessons taught
- 13 students with proven track record of A-A* achievement
- 5 star reviews from all customers

September 2019 - Present

Online

• **University of Bath**

Teaching Assistant

- Demonstrating during 2nd year undergraduate computing laboratory sessions

October 2023 - June 2024

Bath, UK

• **University of Bath**

Peer Assisted Learning Leader

- Organising and running peer assisted learning sessions for 1st year undergraduate Physics students

October 2023 - June 2024

Bath, UK

CONFERENCES, TALKS & POSTERS

Invited Talk - LSST DESC Cosmology with Peculiar Velocities Workshop, Marseille, France

Sep 2025

Talk title: Charting the Local Universe with ATLAS: A New Low- z Sample of Type Ia Supernovae

Contributed Talk - UK & Ireland All Transients Meeting, Warwick, UK

Sep 2025

Talk title: Charting the Local Universe with ATLAS: A New Low- z Sample of Type Ia Supernovae

5th Wetton Workshop, Oxford, UK

Sep 2025

Contributed Talk - Cosmic Lighthouses, Cambridge, UK

Jul 2025

Talk title: Charting the Local Universe with ATLAS: A New Low- z Sample of Type Ia Supernovae

Breakthrough Discuss, Oxford, UK

Apr 2025

VLT, Supernovae, Bruno @ 65 & H_0 @ ?, Garching, Germany

Apr 2025

LSST Broker Meeting, Oxford, UK

Jan 2025

STFC Summer School, Keele, UK

Sep 2024

Contributed Talk - SPINS-UK, Oxford, UK

Nov 2023

Talk title: Unveiling the nature of neutron star cores: A Bayesian inference of nucleonic parameters for a variety of exotic core models

Poster - Neutron and Muon Science User Meeting (NMSUM), Warwick, UK

Apr 2022

Poster title: Pulsed neutron die-away feasibility experiments for the validation of new neutron transport codes and thermal scattering laws

OUTREACH, ENGAGEMENT & EXTRACURRICULAR

Green Templeton College Open Doors Outreach Event, Oxford, UK

2025

Balliol College Fibonacci Summer School Talk - 'Flashes in the Abyss', Oxford, UK

2025

Balliol College Frontier Summer School Talk - 'Flashes in the Abyss', Oxford, UK

2025

St John's College Inspire Summer School Talk - 'Flashes in the Abyss', Oxford, UK

2025

Oxford Physics Summer School Programme Talk - 'Flashes in the Abyss', Oxford, UK

2025

Tutor for Oxford Physics UNIQ Programme, Oxford, UK [🌐]

2025

Astrophysics Outreach at Local Homeless Shelter, Oxford, UK

2025

Panel Member & Ambassador for PhD Applicant Open Days, Oxford, UK

2025

Oxford COMPOS Programme Talk - 'How We Measure the Universe', Oxford, UK [🌐]

2025

Careers stand at local secondary school, Oxford, UK

2025

Delivering 'Calculating the Age of the Universe' Workshop, Oxford, UK

2024-2025

Target Bath Programme Ambassador, Bath, UK [🌐]

2024

Pathway to Bath Programme Tutor and Ambassador, Bath, UK [🌐]

2021-2024

Discover Bath Programme Ambassador, Bath, UK [🌐]

2021-2024

Widening Participation and Outreach Student Ambassador (variety of events), Bath, UK

2019-2024

Open Day Ambassador, Bath, UK

2019-2024

Ambassador for Physics Department Applicant Visit Days, Bath, UK

2019-2024

Peer Mentor (11 1st year undergraduate Physics students), Bath, UK

2020-2021

PROFESSIONAL ACTIVITIES

Graduate representative for Astrophysics (staff-student liaison)

2025-2026

Staff-Student Liaison Committee Member and Academic Representative

2019-2020

CODING SKILLS

Languages: Python, LaTeX, C, bash/zsh

Libraries: numpy, matplotlib, pandas, scipy, astropy, sncosmo, emcee, bagpipes, prospector

Frameworks: SNANA

Other: Experiences with Linux environments and high-performance computing and simulations, including numerical physics simulations involving Monte Carlo / Markov Chain Monte Carlo methods and fluid dynamics / radiative transfer.

AWARDS, PRIZES & GRANTS

St John's College, University of Oxford Graduate Student Grant, Cosmic Lighthouses (£300)	2025
St John's College, University of Oxford Graduate Student Grant, VLT, Supernovae, Bruno @ 65 & H_0 @ ? (£430)	2025
STFC Astrophysics DPhil Studentship	2024
University of Bath Chancellor's Prize (£1,500) [🌐]	2024
University of Bath Ayliffe Prize (£250)	2024
SPINS-UK, University of Oxford Early Career Researcher Funding (£350)	2023

Last updated on November 8, 2025. References, transcripts and certificates available upon request.