

# Jack William Tweddle

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1<sup>st</sup> Year DPhil Student in Astrophysics, University of Oxford, UK

## PRIMARY RESEARCH INTERESTS

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- 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

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- **University of Oxford, St. John's College** October 2024 - Present  
*DPhil Astrophysics* Oxford, UK
  - **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  
*MPhys (Hons) Physics with Astrophysics with Professional Placement* Bath, UK
  - **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  
*Summer Research Intern* Bath, UK
  - 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  
*Nuclear Analyst* Didcot, UK
  - 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

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- **University of Oxford** October 2025 - Present  
*Course Tutor, 4<sup>th</sup> Year Astrophysics* Oxford, UK
  - 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  
*Laboratory Demonstrator, 3<sup>rd</sup> Year Astrophysics* Oxford, UK
  - 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
- **University of Bath**
  - Teaching Assistant*
  - Demonstrating during 2<sup>nd</sup> year undergraduate computing laboratory sessions
- **University of Bath**
  - Peer Assisted Learning Leader*
  - Organising and running peer assisted learning sessions for 1<sup>st</sup> year undergraduate Physics students

September 2019 - Present

Online

October 2023 - June 2024

Bath, UK

October 2023 - June 2024

Bath, UK

## CONFERENCES, TALKS & POSTERS

<b>Invited Talk</b> - LSST DESC Cosmology with Peculiar Velocities Workshop, Marseille, France	Sep 2025
<b>Talk title:</b> Charting the Local Universe with ATLAS: A New Low- $z$ Sample of Type Ia Supernovae	
<b>Contributed Talk</b> - UK & Ireland All Transients Meeting, Warwick, UK	Sep 2025
<b>Talk title:</b> Charting the Local Universe with ATLAS: A New Low- $z$ Sample of Type Ia Supernovae	
5 <sup>th</sup> Wetton Workshop, Oxford, UK	Sep 2025
<b>Contributed Talk</b> - Cosmic Lighthouses, Cambridge, UK	Jul 2025
<b>Talk title:</b> 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 & $H_0$ @ ?, Gärching, Germany	Apr 2025
LSST Broker Meeting, Oxford, UK	Jan 2025
STFC Summer School, Keele, UK	Sep 2024
<b>Contributed Talk</b> - SPINS-UK, Oxford, UK	Nov 2023
<b>Talk title:</b> Unveiling the nature of neutron star cores: A Bayesian inference of nucleonic parameters for a variety of exotic core models	
<b>Poster</b> - Neutron and Muon Science User Meeting (NMSUM), Warwick, UK	Apr 2022
<b>Poster title:</b> 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 1 <sup>st</sup> 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.