

# Jonah Powley

Astrophysics PhD Student

✉ jmp258@cam.ac.uk    🌐 jonahpowley

## Research Interests

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Galaxy quenching, morphology, kinematics and chemical abundance patterns in the early Universe  
Bayesian inference to address key questions in galaxy formation and evolution  
Designing novel analysis techniques using integral field spectroscopy  
Interdisciplinary research in the philosophy of autism

## Education

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**University of Cambridge** 2025 - present  
PhD Physics, Sidney Sussex College  
Thesis: *Properties and pathways of the first quiescent galaxies*, Supervisor: Dr. Sandro Tacchella

**Durham University** 2024 - 2025  
MSc Scientific Computing & Data Analysis (Astrophysics), Grey College, Distinction  
Thesis: *Shock's shocks everywhere! Or the interstellar medium in 3D*, Supervisor: Dr. Anna McLeod

**University of Nottingham** 2021 - 2024  
BSc Physics & Philosophy, First Class Honours

## Research Experience

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**Kavli Institute For Cosmology, University of Cambridge** 2025 - present  
*PhD Student*

- Created tool to perform joint photometric & spectroscopic bulge-disc decompositions using JWST NIRSpec/IFU data
- Performed stellar population analysis with  $\alpha$ -enhanced models to infer star formation histories and constrain high- $z$  growth and quenching mechanisms for bulge and disc components

**Centre for Extragalactic Astronomy, Durham University** 2025  
*Master's Student*

- Developed novel 3D diagnostic diagram for distinguishing shocks from other ionizing sources
- Identified shocks using VLT/MUSE data across a range of physical scales and energy regimes

**Oxford Astrophysics, University of Oxford** 2024  
*Summer Student*

Project: *The growth of supermassive black holes*, Supervisor: Dr. Rebecca Smethurst

- Devised new metric for parameterising kinematic disturbance in a galaxy
- Applied method to AGN in the MaNGA survey and correlated it with AGN/galaxy properties

## Publications

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### First Author

[1] Powley et al., *submitted*. Introducing  $\Delta V_{\star-g}$ : a new universal kinematic disturbance parameter  
*Publication in philosophy*: Powley, *submitted*. An Autistic Phenomenology of Structural Disorientation

### Co-author

## Observing Programs

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**Co-I LAPIS/JWST 1000.0 hrs** (Large Area Parallel Imaging Survey, PI: S. Tacchella) 2027

## Technical Skills

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**Programming:** Python (*advanced*); Bash, L<sup>A</sup>T<sub>E</sub>X, Git (*intermediate*); C/C++, R (*working*)

**Observational Expertise:** JWST photometry and spectroscopy; IFU spectroscopy; VLT/MUSE data reduction and sky subtraction

**Modelling & Inference:** SED modelling (PROSPECTOR, BAGPIPES); morphological fitting (PYSERSIC), MCMC

**Statistical & Machine Learning:** Bayesian statistics, unsupervised clustering, neural networks

**Software Development:** Author of astronomy packages (GORDIAN, PTERO, DVSG); analysis pipelines

## Funding & Grants

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Vice-Chancellor's & Sidney Sussex Basil Howard Scholarship 2025 - present  
*Prestigious PhD studentship awarded by The Cambridge Trust and Sidney Sussex College*

Grey College Opportunity Award 2025  
*Funding to attend the 2025 National Astronomy Meeting*

## Awards & Prizes

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Exceptional Achievement Award, Durham University 2025  
*Awarded in recognition of being the top performing student in the MSc cohort. £200 prize*

Outstanding Undergraduate Performance Joint Hons, University of Nottingham 2024  
*Awarded for achieving the highest mark as a joint honours philosophy student*

## Conferences & Talks

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**Poster** – The Many Scales of Galaxy Environments – Ascona, Switzerland Jul 2026

**Poster** – BeyondHubble – Cambridge, UK Apr 2026

Meeting on Multi-phase AGN Outflows (Royal Astronomical Society) – London, UK Oct 2025

National Astronomy Meeting – Durham, UK Jul 2025

**Contributed Talk** – Astronomy Lunch Talk – Durham University, UK Apr 2025

**Invited Talk** – Summer Intern Symposium – University of Oxford, UK Aug 2024

Breakthrough Discuss – Oxford, UK Jul 2024

## Teaching & Mentoring

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Supervisor – Astrophysics of the Universe (3rd year course), University of Cambridge 2026

## Outreach & Engagement

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Helper organiser – Kavli Institute for Cosmology Open Day – University of Cambridge 2026 - present

Speaker & Team Leader – 'God and the Big Bang' (school science-faith initiative) 2025 - present

Public astronomy talks (5 events; audiences 10–30) 2024 - present

Student helper – Physics Work Experience Week, University of Nottingham 2023-2024

## Professional Activities

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### Committees

LOC Member – The Many Scales of Galaxy Environments – Ascona, Switzerland 2026

LOC Member – BeyondHubble – Cambridge, UK 2026

Co-organiser – Cavendish Graduate Student Conference – University of Cambridge 2026

Lead Organiser – MISCADA Lightning Talks – Durham University 2025

### Scientific Collaborations

MOONS Consortium 2026 - present

### Memberships

Royal Astronomical Society 2025 - present