Alice Bowden

Nijmegen, NL

alice.mbowden@gmail.com — alice.bowden@ru.nl — +44 7804745005

RESEARCH INTERESTS

Quantum gravity; Asymptotic safety; Methodologies in quantum gravity; Experimental tests of quantum gravity; Cosmology; Inflation; Experimental tests of inflation.

EDUCATION

Radboud University, Nijmegen, NL — Sep 2024 — Present
Master of Science - Particle and Astrophysics: Gravity+ — 8.0 (Current Ave.)
Thesis title: RG Improvements to Cosmological Power Spectra

University of Bristol, Bristol, UK — Oct 2018 — Jun 2023
Master of Science - Physics with International Experience (Harvard University, Cambridge, USA) — First Class Honours
Thesis title: Jet-Galaxy Interactions in Luminous Radio Galaxies

RESEARCH EXPERIENCE

RG Improvements to Cosmological Spectra — May 2024 — Present
Radboud University, Nijmegen, NL

- Master's thesis supervised by Prof. Frank Saueressig.
- Working in the framework of asymptotic safety to develop renormalisation group improvements to CMB power spectra.
- Testing the influence that shifting the NGFP has on the level at which quantum effects begin to influence the spectrum.
- Investigating and discussing the constraints this puts on future detectors to observe these results.

Jet-galaxy Interactions in Luminous Radio Galaxies — Oct 2022 — Jun 2023
University of Bristol, Bristol, UK

- Master's thesis supervised by Prof. Mark Birkinshaw and Prof. Belinda Wilkes.
- Studied X-ray and radio emissions of two 3CRR galaxies to determine the mechanism powering their hotspots and cores.
- Produced detailed radio maps from raw data for galaxies 3CR 9 and 3CR 14 allowing for computation of their regional magnetic field strengths.

Calibrating the Quasar Hubble diagram — Oct 2020 — Jun 2022
Harvard-Smithsonian Center for Astrophysics, Cambridge, MA, USA

- Research placement supervised by Dr. Francesca Civano, in collaboration with Dr. Risaliti and Dr. Lusso.
- Processed and analysed the spectral energy distribution of over forty active galactic nuclei using CCT X-ray data.
- Constrained low redshift data to support a larger collaboration producing a Quasar Hubble diagram.
- Results presented at the 240th American Astronomical Society.

TEACHING EXPERIENCE

Teaching Assistant — Nijmegen, NL
Quantum Mechanics 2 — Sep 2025 — Present

Private Tutor — Bristol, UK
Physics and Mathematics — Sep 2022 — Mar 2023

PUBLICATIONS

Journal paper:
In preparation: Higginson, T., Wilkes, B., Bowden, A. (Exp. 2025) Title: *Extended Emission from Quasars 3CR 9 and 3CR 14* [TBC]

AWARDS

NL Scholarship
Radboud University

Nijmegen, NL
Sep 2024

Radboud Scholarship Programme
Radboud University

Nijmegen, NL
Sep 2024 — Jun 2026

SELECTED COURSES

Master's Courses

- General Relativity
- Quantum Field Theory
- Physics and Philosophy
- Gravity and the Cosmos
- Particles and the Cosmos
- Advanced Quantum Physics
- Astronomical Instrumentation and Data Analysis

Additional Courses

- Gravity+ Club
- Quantum Information Theory
- Astrophysical Fluid Mechanics
- Foundations of Modern Physics

Bachelor's Courses

- Cosmology
- Thermodynamics
- Special Relativity
- Quantum Mechanics

VOLUNTARY WORK

Amnesty International
Bookshop assistant

Brighton, UK
Sep 2023 — June 2024

Clifton Community Bookshop
Bookshop assistant

Bristol, UK
Sep 2022 — May 2024

PROGRAMMING

- **Languages:** Python, HTML, Mathematica
- **Packages:** EMCEE, Pandas, SciPy, AstroPy, NumPy, Matplotlib, Sherpa

REFERENCES

Prof. Dr. Frank Saueressig
Professor of High-Energy Physics, Faculty of Science, Radboud University, Nijmegen, NL
E-mail: f.saueressig@science.ru.nl
Scholar profiles: Radboud University - Personal page — Inspire HEP — ORCID

Prof. Dr. Belinda Wilkes
Former Director, Chandra X-ray Center, Harvard-Smithsonian Center for Astrophysics, Cambridge, USA
Honorary Professor, School of Physics, University of Bristol, Bristol, UK
E-mail: belinda.wilkes@bristol.ac.uk
Scholar profiles: University of Bristol - Personal page — NASA ADS — Inspire HEP — ORCID