

Dr. Paul Bowen

Curriculum Vitae



+447974173871
paulobowen@gmail.com
<https://github.com/pb475>
<https://www.linkedin.com/in/-paul-bowen/>

PERSONAL STATEMENT

I am a highly motivated and detail-oriented individual with a Ph.D. in mathematics, specializing in non-equilibrium thermodynamics and numerical modelling in weather and climate models. I am keen to apply my extensive expertise and robust background in mathematics to a challenging technical role. With a proven track record in developing innovative algorithms, collaborating on international research projects, and leading teams, I am confident in my ability to make valuable contributions to your organisation.

My aptitude for using mathematical concepts and models to solve real-world problems is complemented by my current position within an international team of researchers. In this role, I focus on improving and optimising the numerical representation of clouds within climate models. With a strong foundation in applied numerical methods, I am well-equipped to be a valuable addition to any technical company seeking to manage and solve complex problems through mathematical approaches.

EDUCATION

- 2018 – 2023 **Doctor of Philosophy** – Mathematics
IMPROVING MOIST THERMODYNAMICS IN WEATHER AND CLIMATE MODELS
University of Exeter
- 2013 – 2016 **Bachelors of Science** – Applied Mathematics and Theoretical Physics
FIRST CLASS (HONOURS)
Coventry University

SKILLS

- PROGRAMMING LANGUAGES: C, FORTRAN, MATLAB, Python
- OTHER TECH SKILLS: Version control (git, fcm), Docker, L^AT_EX, linux, Microsoft Office, parallel computing
- MATHEMATICS: Numerical & mathematical modelling, algorithm development, data analysis, linear algebra, constrained optimisation
- PERSONAL: Project management, collaboration, teaching, problem solving, public communication

EXPERIENCE

University of Exeter

AUG 2022 – CURRENT

Postdoctoral Research Associate

- Responsible for continued development of the a cloud parcel numerical model. Lead the ongoing maintenance, and added new features to support innovative research.
- Managed the GitHub organization for the research group, overseeing version control, collaboration, and code sharing among team members to enhance project coordination and productivity.
- Collaborated with the Met Office, playing a key role in embedding our cloud parcel model into the Unified Model, fostering cross-institutional cooperation and testing droplet activation schemes.
- Designed and implemented both the backend and frontend of a website dedicated to running simulations for international research partners. Achieved successful public launch, facilitating global outreach and collaboration.
- Collaborated with an international team of researchers to improve numerical droplet activation schemes.
- Handled and analysed large datasets, to gain insights and understanding of global data patterns, and to inform algorithm improvements.

University of Exeter

SEPT 2018 – AUG 2022

PhD Researcher

- Presented novel research findings at both national and international conferences, effectively communicating complex concepts to diverse audiences and fostering valuable connections within the academic community.

- Achieved first-authorship on two publications in the *Quarterly Journal of the Royal Meteorological Society*, showcasing significant contributions to atmospheric science research.
- Conducted NERC-funded mathematical research under the mentorship of Prof. John Thuburn.
- Contributed to the development of innovative algorithms in constrained optimisation.
- Implemented an efficient semi-implicit semi-Lagrangian numerical solver for high-resolution atmospheric simulations.
- Created a non-equilibrium thermodynamic framework to model atmospheric microphysics, integrating it with fluid dynamics equations.

University of Exeter

SEPT 2018 – AUG 2022

Postgraduate Teaching Assistant

- Offered valuable teaching support for undergraduate courses in mathematics and programming, enhancing student learning experiences.
- Led small tutorial classes on mathematical methods, fostering student understanding and application of key concepts.
- Evaluated assessments, designed in-class tests, and delivered comprehensive feedback on submitted work, contributing to a constructive learning environment.
- Contributed as a team member in computer workshop classes, fostering collaborative learning environments for students.

King Solomon Academy

NOV 2017 – AUG 2018

Mathematics Teacher

- Taught further maths classes for years 12 and 13.
- Led special math support classes for students with different learning needs from Year 7 to Year 11.
- Initiated and led an extracurricular group teaching Python programming.
- Developed new lesson content to align with the updated curriculum.

Sigma Support Centre

FEB 2017 – JULY 2017

Mathematics Support & Video Production Assistant

- Created a new online self-led learning project to enable students to supplement their academic development.
- Provided specialised mathematics support to undergraduates.
- Planned, scripted, and produced maths video tutorials.

Coventry University

SEPT 2016 – MAY 2017

Teaching Assistant

- Conducted small tutorial classes, offering personalized assistance to students and reinforcing key principles in maths.
- Provided tutorial support, teaching undergraduate mathematics, physics, and programming.

Coventry University

MAY 2016 – AUG 2016

Research Intern

- Implemented a Pruned Enriched Monte-Carlo method to model interacting polymers on a lattice.
- Gained understanding of how to use an HPC and develop efficient numerical algorithms.

PUBLICATIONS

Bowen, P., and Thuburn, J. (2022). Consistent and flexible thermodynamics in atmospheric models using internal energy as a thermodynamic potential. Part I: Equilibrium regime. *Quarterly Journal of the Royal Meteorological Society*. 148(749), 3730–3755. Available from: <https://doi.org/10.1002/qj.4385>.

Bowen, P., and Thuburn, J. (2022). Consistent and flexible thermodynamics in atmospheric models using internal energy as a thermodynamic potential. Part II: Non-equilibrium regime. *Quarterly Journal of the Royal Meteorological Society*. 148(749), 3540–3565. Available from: <https://doi.org/10.1002/qj.4373>.