

THE UNIVERSITY OF MANCHESTER
PARTICULARS OF APPOINTMENT
FACULTY OF SCIENCE & ENGINEERING
SCHOOL OF NATURAL SCIENCES
DEPARTMENT OF EARTH AND ENVIRONMENTAL SCIENCES
RESEARCH ASSOCIATE IN SECONDARY ICE MECHANISMS
VACANCY REF: SAE-020898

Salary: Grade 6 £34,308 to £36,386 per annum, depending on relevant experience

Hours: Full Time

Duration: Fixed term from TBC until 30 September 2024

Location: Oxford Road, Manchester

Enquiries about the vacancy, shortlisting and interviews:

Name: Prof Paul Connolly

Email: paul.connolly@manchester.ac.uk

Background

The purpose of this project is to acquire insights into how ice is formed in natural clouds. First, at the largest scales, clouds contribute approximately half of the Earth's total reflection of incoming radiation back to space. Our current lack of understanding in cloud-radiation feedbacks and forcings, from aerosols modifying clouds, dominates the uncertainty around future global warming according to the IPCC. Secondly, at the other extreme, on the local-scales, various types of ice precipitation create severe weather. Freezing rain, for instance, has caused 3 billion US dollars of damage per decade over the second half of the 20th century and caused commercial aircraft to crash resulting in loss of life. Equally, hail causes billions of dollars of damage every year, from damage to buildings to destruction of crops.

Despite these impacts the skill of forecasts of ice precipitation during severe weather remains limited. Representations of these phenomena in numerical weather prediction (NWP) models are limited by empirical knowledge from scarce laboratory experiments. Recently, in the Latham Laboratories at the University of Manchester, our research group have identified a new mechanism that occurs within clouds in the atmosphere, which we believe can have a large impact on radiation and precipitation processes. Furthermore, in summer 2022 our group collected a large amount of observational data in convective clouds, where we believe these processes to be of

importance. Hence, we have an ideal dataset to now test the current understanding of ice formation within convective clouds.

Overall Purpose of the Job

In this project you will investigate how “secondary ice mechanisms” impact convective cloud processes, atmospheric radiation, and precipitation. This 18-month PDRA position will focus on understanding secondary ice mechanisms in deep tropical convective clouds using existing data and state-of-the-art models. There may also be opportunities to extend the post.

Key Responsibilities, Accountabilities or Duties

The range of duties will include:

- Translate knowledge of advances in the subject area into research activity.
- Deal with routine communication using a range of media.
- Communicate complex information, orally, in writing and electronically.
- Communicate material of a specialist or highly technical nature.
- Liaise with colleagues and students.
- Build internal contacts and participate in internal networks for the exchange of information and to form relationships for future collaboration.
- Join external networks to share information and identify potential sources of funds.
- Manage own research and administrative activities, with guidance if required.
- Collaborate with academic colleagues on areas of shared research interest.
- Attend and contribute to relevant meetings.
- Use new research techniques and methods.
- Use initiative and creativity to identify areas for research, develop new research methods and extend the research portfolio.
- Use creativity to analyse and interpret research data and draw conclusions on the outcomes.
- Use research resources, laboratories and workshops as appropriate.
- Plan and manage own research activity in collaboration with others.
- Be aware of the risks in the work environment and their potential impact on their own work and that of others.

PERSON SPECIFICATION

Essential:

- Have, or be about to obtain, a relevant PhD (or equivalent) in atmospheric science or related subjects.
- Have a publication track record.
- Excellent communication and interpersonal skills.
- Excellent organisational and analytical skills.
- Scientific report writing.
- Willingness to conduct modelling work.
- Ability to work in a multi-disciplinary team.
- Excellent time management and organisational skills.

- Ability to work independently and as part of a team.
- Ability to liaise confidently and effectively with a range of individuals.
- Flexible approach to dealing with research problems as they arise.
- Willingness to learn and develop.
- Ability to present in both written and oral publications.
- Ability to meet deadlines.
- The ability to evaluate complex data.
- Understand equal opportunity issues as they may impact on areas of research content.

Desirable:

- Experience in handling large datasets.
- Programming skills / data analysis.