

Position description

Research Fellow

Department/Unit	School of Earth, Atmosphere and Environment
Faculty/Division	Science
Classification	Level A
Work location	Clayton campus
Date document created or updated	4 May 2017

Organisational context

Monash is a university of transformation, progress and optimism. Our people are our most valued asset, with our academics among the best in the world and our professional staff revolutionising the way we operate as an organisation. For more information about our University and our exciting future, please visit www.monash.edu

The **Faculty of Science** works through frontiers via our research, teaching and our partnerships with industry, government and individual supporters. Our five Schools offer a large and diverse range of disciplines in undergraduate and postgraduate courses. Ten Schools from other university faculties contribute to science teaching at all levels, allowing students to choose their studies from physical, biological, biomedical, behavioural, environmental, mathematical and computer sciences. In terms of research, our respected researchers are at the top of their game. Their work spans the theoretical to the applied, contributes to new knowledge and technologies, and challenges how we interact with the world. To learn more about the Faculty of Science, please visit our website: www.monash.edu/science/

The **School of Earth, Atmosphere and Environment** is located in the Faculty of Science (www.monash.edu/science/) and has close collaborations with other Schools in the faculty such as Physics, Mathematics and Biology, as well as other faculties such as Business and Economics, Arts, and Engineering. The School has strong links with outside institutions such as CSIRO, The Australian Synchrotron, the Bureau of Meteorology, and Geoscience Australia and a large number of research institutes and universities around the world.

The School is highly multidisciplinary with very active groups in Dynamical Meteorology, Climate Dynamics, Cloud Processes, Turbulence and Atmospheric Convection, Biosphere-Atmosphere Interaction, Climate Impacts and Adaptation, Atmospheric Modelling, Urban Climate, Geodynamics, Tectonics and Structural Geology, Environmental Mineralogy, Synchrotron Geoscience and Geochemistry, Hydrogeology and Hydrochemistry, Economic Geology and Petrology, Soil Science, Environmental Earth Science, Applied Geophysics, Geomorphology, GIS and Remote Sensing. The School is actively involved in several research Centres, such as the Australian Research Council's Centre of Excellence for Climate System Science, the **Australian Research Council's Centre of Excellence for Climate Extremes**, the Corporate Research Centre for Water Sensitive Cities and the 3D ALIVE (Applied Laboratory for Immersive Visualisation Environment).

The working environment is the **Atmosphere and Climate group** which is based in the School of Earth, Atmosphere and Environment. The particular strengths of the group can be found at <https://www.monash.edu/science/schools/earth-atmosphere-environment/research>.

This group forms part of the newly ARC-Funded **Centre of Excellence for Climate Extremes** (see <http://arc-extremes.weebly.com>). The ARC Centre of Excellence for Climate Extremes is a major 7 year initiative supported by the Australian Research Council. It is a consortium of five Australian universities with a suite of outstanding national and international Partner Organisations as collaborators. The Centre of Excellence research agenda encompasses interconnected research programs focused on Heatwaves, Rainfall, Drought and Variability in the Tropics and Extratropics.

The ARC Centre of Excellence for Climate Extremes will provide a supportive and enriching workplace for Early Career Researchers. In particular, the Centre has a strong commitment to equity, diversity and inclusion. In order to boost opportunities for researchers from under-represented groups, we will offer a competitive fellowship scheme to resource leadership training, career development and other programs in addition to the extensive opportunities already offered in the Centre.

Position purpose

A Level A research-only academic is expected to contribute towards the research effort of the university and to develop her/his research expertise through the pursuit of defined projects relevant to the particular field of research.

Under the umbrella of the ARC Centre of Excellence for Climate Extremes, the incumbent will first use radar and large scale data to better understand the processes involved in convective rainfall and its extremes both in tropical and extratropical environments. There will be a focus on the role on how organised convection plays in producing rainfall as well as how the organisation is related to the larger-scale state of the atmosphere.

Based on the findings of the first part, the project will evaluate the ability of the ACCESS model, and potentially other climate models, to simulate the processes involved in heavy convective rainfall. It will then develop and test new approaches to parametrising convection to improve the model behaviour. The project will be carried out in strong collaboration with efforts around systematic model errors carried out in the NESP and at Bureau of Meteorology as part of the MCV-funded research on Seasonal prediction. The project would also be strongly integrated in a model evaluation and improvement theme of the Centre.

Reporting Line: The position reports to a Professor in the School, under broad direction

Supervisory responsibilities: Not applicable

Financial delegation and/or budget responsibilities: Not applicable

Key responsibilities

A Level A research-only academic shall work with support, guidance and/or direction from staff classified at Level B and above and with an increasing degree of autonomy as the research academic gains in skill and experience.

Specific duties required of a Level A research-only academic may include:

1. Investigate the physical processes underpinning rainfall extremes in the Australian region using radar and satellite observations as well as re-analyses
2. Develop conceptual models of the key processes, in particular atmospheric convection, that are suitable to be used as parametrisations in global climate models
3. Implement and test new parametrisations in the atmospheric model of the Australian Community Climate and Earth System Simulator (ACCESS)
4. Assist in supervising honours and graduate students working on the project
5. Participate in group activities, including small amounts of group related administration
6. Present research at national and international conferences
7. Prepare research papers for submission to quality refereed journals

Key selection criteria

Education/Qualifications

1. The incumbent should possess:
 - a PhD in atmospheric science or a related discipline from a recognised university, or equivalent qualifications and research experience in the area; or
 - an equivalent combination of relevant experience and/or education/training

Knowledge and Skills

2. A good understanding of atmospheric physical processes, in particular boundary layer processes and atmospheric convection
3. A proven ability to insightfully analyze large observational and model data sets
4. An ability to develop and modify code for atmospheric models
5. A high level of computing skills, including programming experience in a major programming language and a mainstream visualization package
6. Proven ability to work within a collaborative team of scientific researchers
7. Excellent communication and writing skills

Other job related information

- Travel (e.g. to other campuses of the University) may be required
- There may be peak periods of work during which the taking of leave may be restricted

Legal compliance

Ensure you are aware of and adhere to legislation and University policy relevant to the duties undertaken, including: Equal Employment Opportunity, supporting equity and fairness; Occupational Health and Safety, supporting a safe workplace; Conflict of Interest (including Conflict of Interest in Research); Paid Outside Work; Privacy; Research Conduct; and Staff/Student Relationships.