



Position description

Research Fellow in Cold Atoms Theory

Department/Unit	School of Physics and Astronomy
Faculty/Division	Faculty of Science
Classification	Level A
Work location	Clayton campus
Date document created or updated	6 December 2016

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/

School of Physics and Astronomy is located within the Faculty of Science. It aims to position itself as one of the top physics and astronomy research and teaching departments in Australia. In the past four years the School has gone through an exciting period of renewal, investing significantly in people and facilities. The School of Physics and Astronomy is committed to teaching and research of the highest quality in astronomy, astrophysics, experimental physics, and theoretical physics; it aims to produce graduates with a solid foundation in physics and astrophysics. We are recognised internationally for research in several fields of physics and astrophysics; however, we are focused on significantly strengthening our research base to achieve the status of a top ranked international department.

Further information about the position and the School of Physics and Astronomy is available at: www.physics.monash.edu.au

The Monash Quantum Fluids Group comprises two BEC laboratories and 10 staff members working on theoretical and experimental aspects of cold atoms physics. Dr Tapio Simula has established a cold atoms theory programme at Monash in the New Horizons Research Centre with a current research focus on topological excitations and two-dimensional quantum turbulence.

Further information on Simula's research programme is available at: <http://bec.physics.monash.edu.au/>

Position purpose

The Research Fellow will study the physics of topological excitations such as quantised vortices and their dynamical properties in Bose-Einstein condensates and superfluid Fermi gases. This position will involve application of theoretical and computational techniques. The position is funded as part of the [ARC Discovery Project](#) lead by Dr Tapio Simula. The researcher will be required to interface with staff, PhD and Honours students. The researcher is also expected to conduct cutting-edge research on cold atoms physics, publish papers in high-impact journals and present results at major international conferences.

Reporting line: The position reports to the relevant academic as nominated by the Head of School

Supervisory responsibilities: Not Applicable

Financial delegation and/or budget responsibilities: Not applicable

Key responsibilities

1. Establish a programme of research into the properties of topological excitations in cold atomic gases capable of attracting external funding, publish research outcomes in high impact physics journals and foster postgraduate research training
2. Mentor and supervise postgraduate researchers
3. Foster collaborative research in cold atom physics, by working with academic staff and other researchers as appropriate to promote research collaboration, complementarity of research and education programmes
4. Foster the development of innovative scientific programmes with the research partners associated with the ARC-funded grant
5. Foster research collaboration and research opportunities
6. Develop collaborations with other research groups in Australia and internationally
7. Provide input to the strategic planning of the School's initiatives in cold atom physics

Key selection criteria

Education/Qualifications

1. The incumbent should possess:
 - relevant academic qualifications, including a PhD (or equivalent) in physics of cold atoms, or a closely related field from a recognised university

Knowledge and Skills

2. Research achievements in physics or related field, including a record of scientific creativity, publications and citations in high impact physics journals
3. Potential to lead an independent research programme in physics
4. Potential to attract National Competitive Grants to fund research
5. Excellent written and verbal communication skills necessary to carry out the duties of the position
6. Research experience on topological excitations such as quantised vortices, working knowledge of theoretical and computational cold atoms frameworks such as dynamical mean-field and Bogoliubov-de Gennes theories, and experience on programming and high-performance computing
8. Potential to develop a public profile as a leader in his/her field of physics

Other job-related information

- Travel (e.g. to other campuses of the University) may be required
- Out of hours work (including evenings, weekends and public holidays) 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