

Position description

Research Fellow in Particle Physics

Department/Unit	School of Physics & Astronomy
Faculty/Division	Faculty of Science
Classification	Level A
Employment type	Full time
Work location	Clayton campus
Date document created or updated	3 November 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 position is within the School of Physics & Astronomy, in association with the Department of Econometrics and Business Statistics in the Monash Business School.

The **Faculty of Science** is one of the largest in Australia, renowned worldwide for the quality and calibre of our teaching, research and graduates. We offer a comprehensive range of undergraduate, graduate, postgraduate and higher degree by research programs in a wide range of science disciplines. Our research activities provide a platform for establishing a thriving educational enterprise and our staff are committed to creating a dynamic learning environment. The research activities range from fundamental studies to research with a strong applications orientation.

To learn more about the Faculty of Science, [please visit our website](#).

The Monash Business School undertakes education, research, consultancy and community engagements across all the main business and economics disciplines. It offers a comprehensive selection of awards including bachelor degrees, specialist master degrees by coursework, the Master of Business Administration (MBA), masters by research, and the PhD. Student numbers exceed 17,000, making it one of the largest business education providers in Australia. The Monash Business School operates across all four Australian campuses (Berwick, Caulfield, Clayton and Peninsula) and, together with business schools in South Africa and Malaysia, makes up Monash University's Faculty of Business and Economics. The Monash Business School is structured into seven discipline-based departments (Accounting, Banking and Finance, Business Law and Taxation, Econometrics and Business Statistics, Economics, Management, and Marketing) as well as a number of research centres, units and groups in specialist areas such as behavioural economics, health economics, development economics, financial studies, global business and retail studies.

To learn more about the Monash Business School, please visit our [website](#).

The School of Physics & Astronomy includes a number of senior theoretical particle physicists, postdoctoral research fellows and graduate students. The incumbent will be expected to develop close working relationships with other physicists in the school, and in particular Professor German Valencia and Associate Professor Csaba Balazs.

The Department of Econometrics and Business Statistics is recognised worldwide for the quality of its research and teaching and has been designated by Monash as an area of outstanding strength, 'demonstrably pre-eminent relative to other Australian universities and competitive with the strongest international equivalents'. In the [Excellence in Research for Australia assessment conducted by the Australian Research Council in 2015, Monash University received a rank of 5, which is the highest possible rank, in Econometrics](#). In the [top 10% of institutions in the field of Econometrics](#) ranked by IDEAS (a Research Papers in Economics service maintained by the Federal Reserve Bank of St. Louis, USA) the Department appears among the best institutions in the world. We provide the quantitative training in the Bachelor of Business, the Bachelor of Commerce, as well as several Masters by Coursework programs and we offer a comprehensive curriculum at the undergraduate and postgraduate levels in econometrics, business statistics, financial econometrics and actuarial studies. Many of our senior staff are editors and associate editors of reputable academic journals in econometrics and statistics and we enjoy significant success in gaining grants and contract research. For more information about our Department and the work we do, [please visit our website](#).

Position purpose

The Research Fellow will conduct independent research in visualisation methods for high energy physics, focusing on low-dimensional projections and sections of high-dimensional data. The Research Fellow will be well-trained in computationally methods and linear algebra for high-dimensional spaces, with preferably a background in high energy physics and/or multivariate statistics, and excellent programming skills in R, C++ or python. The position will require interdisciplinary collaboration between physics and data analytics.

Reporting line: The position reports to Professor German Valencia, Associate Professor Csaba Balazs and Professor Dianne Cook

Supervisory responsibilities Nil.

Financial delegation and/or budget responsibilities Nil.

Key result areas and responsibility

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.

Responsibilities include:

1. The conduct of research either as a member of a team or independently and the production of conference and seminar papers and publications from that research
2. Supervision of research-support staff involved in the staff member's research
3. Guidance in the research effort of junior members of research-only Academic staff in her/his research area
4. Contribution to the preparation or, where appropriate, individual preparation of research proposal submissions to external funding bodies
5. Involvement in professional activities including, subject to availability of funds, attendance at conferences and seminars in the field of expertise
6. Occasional contributions to the teaching program within the field of the staff member's research
7. Co-supervision or, where appropriate, supervision of major Honours or postgraduate research projects within the field of the staff member's area of research
8. Attendance at meetings associated with research or the work of the organisational unit to which the research is connected and/or at departmental, school and/or faculty meetings and/or membership of a limited number of committees

Key selection criteria

Essential criteria

1. A PhD in high energy physics, statistics or a closely related field, from a recognized university or equivalent qualifications and research experience in the area
2. Training in computationally intensive methods, and linear algebra for high-dimensional spaces, with demonstrated programming skills in R, C++ or python.
3. Evidence of an emerging track record of publications and presentations.
4. Ability to work independently and under pressure and to prioritise tasks to meet deadlines in a research environment (with limited supervision) and the potential to lead an independent research programme
5. Excellent written and verbal communication skills necessary to carry out the duties of the position.
6. Ability to work both independently and collaboratively as a member of a team
7. Ability to prepare and communicate the aims and outputs of research projects in a range of formats including formal and informal oral presentations, refereed research papers and reports

Desirable criteria

8. Knowledge and experience in data visualisation especially interactive graphics and programming reactive systems
9. Successfully completed courses in multivariate statistics, data mining and high-dimensional data analysis.
10. Knowledge of high energy physics.

Other job-related information

- Travel (eg. to other campuses of the University) may be required
- 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.