

## Position description

### Research Fellow in Particle Physics Phenomenology

|                                  |                                 |
|----------------------------------|---------------------------------|
| Department/Unit                  | School of Physics and Astronomy |
| Faculty/Division                 | Faculty of Science              |
| Classification                   | Level A                         |
| Work location                    | Clayton campus                  |
| Date document created or updated | 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](http://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/](http://www.monash.edu/science/)

**The School of Physics and Astronomy** is a new school located within the Faculty of Science. It was formed in 2015 as a result of merging the former School of Physics with astrophysicists from the School of Mathematical Sciences. The school aims to position itself as one of the top physics and astronomy research and teaching departments in Australia. In the past five 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.

In the 2015 national audit of research excellence (ERA), the school achieved the maximum overall rating of 5 for Physical Sciences, including the maximum rating of 5 in each of our assessed fields of research (spanning astronomy and astrophysics, atomic and molecular physics, nuclear physics, particle physics, condensed matter physics and optics).

Currently the school has 26 academic staff, 28 research-only staff and 17 adjunct staff, supported by 10 professional staff. In 2015 the school's total recurrent income was approximately \$17M, with research income in the past four years totalling >\$22M.

The school's major research activities include the ARC Centre of Excellence for Particle Physics at the Terascale, the Monash Centre for Astrophysics, as well as over a dozen Australian Research Council funded programmes.

**RC Centre of Excellence for Particle Physics at the Terascale (CoEPP)** coordinates tera-scale high energy physics research across Australia, with research groups located at Monash University and the Universities of Adelaide, Melbourne and Sydney. These groups work in close collaboration with key international particle physics institutions, especially with CERN (the European Organization for Nuclear Research) - the location of the Large Hadron Collider (LHC) – and recently a framework for collaboration with Fermi National Accelerator Laboratory in the USA has also been initiated.

**MCnet** is an EU Horizon 2020 Marie Skłodowska-Curie Innovative Training Network running from 2017 through 2020, with nodes in the UK, Sweden, Germany, and Belgium, and associate partners in Australia, USA, and at CERN. Monash is the sole participating partner in Australia, and via the network Monash staff and students have opportunities for collaboration and training involving the network partners.

**Monash-Warwick Alliance.** The theoretical particle physics group has initiated a collaboration with the experimental particle physics group at Warwick University, via the Monash-Warwick Alliance Development Fund,. The collaboration is based on a strategy of developing theory models at Monash and using ATLAS data to test them at Warwick and at CERN.

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

## Position purpose

The Postdoctoral Research Fellow will conduct independent research in theoretical particle physics, focusing on high energy phenomenology, at the highest international levels. The position demands demonstrable productivity, scientific creativity and an exceptional technical knowledge of particle physics.

The position is part of the ARC Centre of Excellence for Particle Physics at the Terascale (CoEPP), spanning nodes at Monash, Melbourne, Adelaide, and Sydney Universities. The Monash node, located at the School of Physics and Astronomy at Monash University's main campus in Clayton, Melbourne, includes three senior academics (A/Prof P. Skands, A/Prof C. Balazs, and Prof G. Valencia), an ARC Future Fellow (Dr P. Athron), three postdoctoral fellows, and numerous postgraduate students, in addition to our CoEPP, MCnet, and other international collaborators. The incumbent will be expected to develop close working relationships with their team, and in particular Associate Professor Csaba Balazs, whose research fields focus on dark matter detection, supersymmetry discovery, isolating new physics at the Large Hadron Collider, and the baryon asymmetry of the Universe.

**Reporting line:** The position reports to the Professorial project head

**Supervisory responsibilities:** Not applicable

**Financial delegation and/or budget responsibilities:** Not applicable

## Key responsibilities

### 1. Leadership and Management

- Engage in the research targeted by CoEPP, focusing on new physics at the LHC and other experiments
- Establish a programme of research capable of attracting external funding, publish research outcomes in high impact physics journals and foster postgraduate research training
- Foster collaborative research in HEP by working with academic staff and other researchers as appropriate to promote research collaboration, complementarity of research and education programmes

### 2. Establishment and Maintenance of Scientific Collaborations

- Foster the development of innovative scientific programmes with the partners in CoEPP, CERN, AUSHEP, Fermilab, and MCnet
- Foster research collaboration and research opportunities
- Develop collaborations with other research groups internationally and in Australia

### 3. Administration, Management and Strategic Planning in the School of Physics and Astronomy

- Provide input to the strategic planning between the School of Physics and Astronomy, and the ARC Centre of Excellence for Particle Physics at the Terascale

## Key selection criteria

### Education/Qualifications

#### Essential:

1. Relevant academic qualifications, including a PhD in theoretical particle physics, or a closely related field
2. Research achievements in particle physics, including a record of scientific creativity, publications and citations in the highest impact physics journals
3. Potential to lead an independent research programme in theoretical particle physics
4. Excellent written and verbal communication skills necessary to carry out the duties of the position
5. A vision for the future needs and development of the field

#### Desirable:

6. Experience with phenomenology of theories beyond the Standard Model of particle physics
7. Some experience with particle astrophysics and/or particle cosmology
8. Ability to contribute to the teaching of undergraduate physics
9. Potential to develop a public profile as a leader in his/her field of physics
10. A record of supervision of postgraduate students
11. Capacity for scientific outreach, including engagement with talented students

## Other job-related information

- After hours work may be required

## 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.