



POSITION DESCRIPTION

School of Physics
Faculty of Science

ASTRO-3D Postdoctoral Researcher on First Galaxies

POSITION NO	0042325
CLASSIFICATION	Level A
SALARY	\$87,415* – \$93,830 p.a. (* PhD entry level)
SUPERANNUATION	Employer contribution of 9.5%
WORKING HOURS	Full time
BASIS OF EMPLOYMENT	Fixed-term for 3 years
OTHER BENEFITS	http://about.unimelb.edu.au/careers/working/benefits
HOW TO APPLY	Online applications are preferred. Go to http://about.unimelb.edu.au/careers , select the relevant option ('Current Staff' or 'Prospective Staff'), then find the position by title or number.
CONTACT FOR ENQUIRIES ONLY	Dr Michele Trenti Tel +61 3 8344 3703 Email mtrenti@unimelb.edu.au <i>Please do not send your application to this contact</i>

For information about working for the University of Melbourne, visit our website:
about.unimelb.edu.au/careers

Position Summary

The Melbourne node of the Australian Research Council (ARC) Centre of Excellence for All Sky Astrophysics in 3-Dimensions (ASTRO-3D) invites applications for a Postdoctoral Research Position on Formation and Evolution of the First Galaxies in the Universe.

The Australian Research Council (ARC) Centre of Excellence for All Sky Astrophysics in 3-Dimensions (ASTRO-3D) spans six (6) Australian universities, three (3) national infrastructure facilities, and seven (7) international partner institutions. ASTRO-3D combines Australia's leading optical, infrared and radio telescope technologies with sophisticated theoretical simulations and ambitious new data intensive science techniques to build a comprehensive picture of the evolution of matter, the chemical elements, and ionizing radiation in the Universe from the Epoch of Reionization to the present day.

The successful applicants will work with Dr Michele Trenti on problems associated with star formation at high redshift, galaxy evolution, use of gamma ray bursts as tools to explore the young Universe, and cosmic reionization. The position will be focused on analysis of data from the Hubble and Spitzer Space Telescopes to discover and characterize the first galaxies in the Universe, and design of strategies for James Webb Space Telescope observations. However, candidates interested in working at the interface between modelling and observations will also be equally considered. A fraction of the time will be available for independent research, and collaborations with other national and international ASTRO-3D partner institutions are strongly encouraged.

The Astrophysics Group at the University of Melbourne provides a vibrant collaborative environment with diverse interests ranging from gravitational wave astrophysics to galaxy formation and evolution, cosmic reionization, and theoretical and observational cosmology. It hosts two ARC Centres of Excellence (ASTRO-3D and OzGrav), five faculty members, over 10 postdoctoral research associates/fellows and 20 graduate students.

2. Key Responsibilities

For Minimum Standards for Academic Staff Level A view

<http://www.policy.unimelb.edu.au/schedules/MPF1157-ScheduleB.pdf>

- ▶ Under limited supervision, undertake internationally competitive research on problems associated with star formation at high redshift and cosmic reionization leading to journal publications.
- ▶ Collaborate with other members of the Astrophysics group.
- ▶ Give seminars and conference presentations as required.
- ▶ Assist and actively contribute, under the guidance of Senior Academics to the preparation of research proposal submissions to external funding bodies.
- ▶ Assist in the co-supervision and training of postgraduate or research higher degree students.
- ▶ Undertake administrative functions and obligations primarily connected with the Fellow's area of research
- ▶ Contribute to the research culture of the School of Physics and the research group by attendance and active participation in meetings and seminars associated with the research work of the project, as well as School meetings and seminars.
- ▶ Contribute and participate in undergraduate and postgraduate teaching and assessment within the allowed parameters of the ARC guidelines.

- ▶ Occupational Health and Safety (OH&S) and Environmental Health and Safety (EH&S) responsibilities as outlined in Section 5.

3. *Selection Criteria*

3.1 ESSENTIAL

- ▶ A PhD or equivalent in Astrophysics or a related area.
- ▶ Expertise in analysis of astronomical imaging data and/or modelling of star formation at high redshift.
- ▶ A demonstrated aptitude for research with a sound record of publication in the area of high redshift star formation, commensurate with experience and opportunities.
- ▶ Demonstrated ability to work both independently and to work effectively with others.
- ▶ Good data analysis and programming skills.
- ▶ Excellent communication skills in English, both written and oral.
- ▶ Demonstrated ability to work to pre-agreed deadlines and milestones and bring projects to a timely completion.

3.2 DESIRABLE

- ▶ Expertise in analysis of imaging data from Space Telescopes (Hubble/Spitzer).
- ▶ Experience in the supervision of students undertaking postgraduate and higher degrees.

4. *Equal Opportunity, Diversity and Inclusion*

The University is an equal opportunity employer and is committed to providing a workplace free from all forms of unlawful discrimination, harassment, bullying, vilification and victimisation. The University makes decisions on employment, promotion and reward on the basis of merit.

The University is committed to all aspects of equal opportunity, diversity and inclusion in the workplace and to providing all staff, students, contractors, honorary appointees, volunteers and visitors with a safe, respectful and rewarding environment free from all forms of unlawful discrimination, harassment, vilification and victimisation. This commitment is set out in the University's People Strategy 2015-2020 and policies that address diversity and inclusion, equal employment opportunity, discrimination, sexual harassment, bullying and appropriate workplace behaviour. All staff are required to comply with all University policies.

The University values diversity because we recognise that the differences in our people's age, race, ethnicity, culture, gender, nationality, sexual orientation, physical ability and background bring richness to our work environment. Consequently, the People Strategy sets out the strategic aim to drive diversity and inclusion across the University to create an environment where the compounding benefits of a diverse workforce are recognised as vital in our continuous desire to strive for excellence and reach the targets of Growing Esteem.

5. *Occupational Health and Safety (OHS)*

All staff are required to take reasonable care for their own health and safety and that of other personnel who may be affected by their conduct.

OHS responsibilities applicable to positions are published at:

<http://safety.unimelb.edu.au/topics/responsibilities/>

These include general staff responsibilities and those additional responsibilities that apply for Managers and Supervisors and other Personnel.

6. *Other Information*

6.1 SCHOOL OF PHYSICS

www.physics.unimelb.edu.au/

The University of Melbourne's School of Physics is one of Australia's leading Physics Schools. It has achieved this status through the high quality of its research and teaching programs. The School offers a wide range of physics subjects to undergraduate and postgraduate students. It is located in the David Caro building on the Swanston Street boundary of the University campus. The Head of School and the majority of the Professional staff are housed on the ground floor of the building to act as the first point of contact for students, staff and visitors. Currently some 25 academics, 23 teaching & research staff, 65 research-only staff, more than 95 postgraduate students and 72 associates supported by 32 professional staff make up the School. The School additionally hosts, 1 Thomas Baker Chair, 1 RAMAP Fellow, 1 ARC Professorial Fellow, 3 ARC Future Fellows, and 6 ARC Discovery Early Career Researcher. Skilled technical staff operate, maintain and develop complex instrumentation and equipment to support the teaching and research activities of the School.

The School currently performs research in the following areas: Astrophysics, Atomic, Molecular and Optical Physics, Experimental Condensed Matter Physics, Experimental Particle Physics, Microanalytical Research Centre, Material Science, Physical Biosciences, Theoretical Condensed Matter Physics and Theoretical Particle Physics.

The School of Physics hosts the ARC Centre of Excellence in Coherent X-Ray Science, ARC Centre of Excellence in Particle Physics at the Terascale and the Melbourne nodes of the ARC Centre of Excellence for Quantum Computation and Communication Technology, the ARC Centre of Excellence for Advanced Molecular Imaging and the ARC Centre of Excellence for All-Sky Astrophysics. The School also plays a major role in the Australian Synchrotron research program.

6.2 FACULTY OF SCIENCE

<http://www.science.unimelb.edu.au>

Science at the University of Melbourne is the most highly ranked Faculty of Science in Australia.* Science is defined by its research excellence in the physical and life sciences and is at the forefront of research addressing major societal issues from climate change to disease. Our discoveries help build an understanding of the world around us.

We have over 150 years of experience in pioneering scientific thinking and analysis, leading to outstanding teaching and learning and offer a curriculum based on highly

relevant research, which empowers our STEM students and graduates to understand and address complexities that impact real world issues and the challenges of tomorrow.

We aspire to engage the broader community with the impact that Science has on our everyday lives. Through the strength of our internships and research project offerings, our students are provided opportunities to engage with industry partners to solve real-world issues.

The Faculty of Science has over 50,000 alumni and is one of the largest faculties in the University comprising seven schools: BioSciences, Chemistry, Earth Sciences, Ecosystem and Forest Sciences, Geography, Mathematics and Statistics, and Physics.

The Faculty is custodian of the Bio21 Molecular Science and Biotechnology Institute, Office for Environmental Programs and home to numerous Centres.

Science manages more than \$290 million of income per annum, with a staff base in the order of 270 professional staff, and more than 580 academic staff.

We offer a range of undergraduate, honours, graduate and research degrees; enrolling over 8,600 undergraduate and 2,440 graduate students. The Faculty of Science is the custodial Faculty for the BSc (Bachelor of Science). The Faculty of Science is a leader in research, contributing approximately \$70 million in HERDC income per annum. The Faculty of Science is highly research focused, performing strongly in the ARC competitive grants schemes, often out-performing the national average. The Faculty of Science is currently growing its competitiveness and standing in the NHMRC space.

The Faculty of Science provides community services and industry partnerships based on a solid foundation of research in the pure and applied sciences. The Faculty has an endowment of approximately \$56 million. The annual income from the endowment supports more than 120 prizes, scholarships and research awards.

* Figures from the latest available data for 2015, including published international rankings data.

6.3 THE UNIVERSITY OF MELBOURNE

Established in 1853, the University of Melbourne is a leading international university with a tradition of excellence in teaching and research. The main campus in Parkville is recognised as the hub of Australia's premier knowledge precinct comprising eight hospitals, many leading research institutes and a wide-range of knowledge-based industries. With outstanding performance in international rankings, the University is at the forefront of higher education in the Asia-Pacific region and the world.

The University employs people of outstanding calibre and offers a unique environment where staff are valued and rewarded.

Further information about working at The University of Melbourne is available at <http://about.unimelb.edu.au/careers>.

6.4 GROWING ESTEEM, THE MELBOURNE CURRICULUM AND RESEARCH AT MELBOURNE: ENSURING EXCELLENCE AND IMPACT TO 2025

Growing Esteem describes Melbourne's strategy to achieve its aspiration to be a public-spirited and internationally-engaged institution, highly regarded for making distinctive contributions to society in research and research training, learning and teaching, and engagement. <http://about.unimelb.edu.au/strategy-and-leadership>

The University is at the forefront of Australia's changing higher education system and offers a distinctive model of education known collectively as the Melbourne Curriculum. The new educational model, designed for an outstanding experience for all students, is based on six broad undergraduate programs followed by a graduate professional degree, research higher degree or entry directly into employment. The emphasis on academic breadth as well as disciplinary depth in the new degrees ensures that graduates will have the capacity to succeed in a world where knowledge boundaries are shifting and reforming to create new frontiers and challenges. In moving to the new model, the University is also aligning itself with the best of emerging European and Asian practice and well-established North American traditions.

The University's global aspirations seek to make significant contributions to major social, economic and environmental challenges. Accordingly, the University's research strategy *Research at Melbourne: Ensuring Excellence and Impact to 2025* aspires to a significant advancement in the excellence and impact of its research outputs. <http://research.unimelb.edu.au/our-research/research-at-melbourne>

The strategy recognises that as a public-spirited, research-intensive institution of the future, the University must strive to make a tangible impact in Australia and the world, working across disciplinary and sectoral boundaries and building deeper and more substantive engagement with industry, collaborators and partners. While cultivating the fundamental enabling disciplines through investigator-driven research, the University has adopted three grand challenges aspiring to solve some of the most difficult problems facing our world in the next century. These Grand Challenges include:

- ▶ Understanding our place and purpose – The place and purpose grand challenge centres on understanding all aspects of our national identity, with a focus on Australia's 'place' in the Asia-Pacific region and the world, and on our 'purpose' or mission to improve all dimensions of the human condition through our research.
- ▶ Fostering health and wellbeing – The health and wellbeing grand challenge focuses on building the scale and breadth of our capabilities in population and global health; on harnessing our contribution to the 'convergence revolution' of biomedical and health research, bringing together the life sciences, engineering and the physical sciences; and on addressing the physical, mental and social aspects of wellbeing by looking beyond the traditional boundaries of biomedicine.
- ▶ Supporting sustainability and resilience – The sustainability and resilience grand challenge addresses the critical issues of climate change, water and food security, sustainable energy and designing resilient cities and regions. In addition to the technical aspects, this grand challenge considers the physical and social functioning of cities, connecting physical phenomena with lessons from our past, and the implications of the technical solutions for economies, living patterns and behaviours.

Essential to tackling these challenges, an outstanding faculty, high performing students, wide collaboration including internationally and deep partnerships with external parties form central components of Research at Melbourne: Ensuring Excellence and Impact to 2025.

6.5 GOVERNANCE

The Vice Chancellor is the Chief Executive Officer of the University and responsible to Council for the good management of the University.

Comprehensive information about the University of Melbourne and its governance structure is available at <http://www.unimelb.edu.au/governance>