

# Global Signal Research Fellow (ALB)



<b>SCHOOL/AREA</b>	Curtin Institute of Radio Astronomy
<b>FACULTY</b>	Faculty of Science and Engineering
<b>LINE MANAGER</b>	Associate Professor Cathryn Trott (position number 3509818)
<b>ROLE STATEMENT</b>	
<p>The University has generic role statements for categories and levels of academic positions. Attached is the role statement applicable to this position. The role statement outlines the accountabilities and responsibilities expected of an academic appointed to this category and level and includes the selection criteria for appointment. For specific details regarding the position please refer to the Position Overview, below.</p>	
<b>POSITION OVERVIEW</b>	
<p>The Research Fellow will work with the Epoch of Reionisation project to design, build and undertake science observations and analysis of the global neutral hydrogen signal from the Cosmic Dawn and Epoch of Reionisation with a prototype array of low radio frequency short-spaced dipoles. The project requires a good knowledge of, and experience with astronomical instrumentation and engineering, and scientific observations and data analysis. The Fellow will work with the MWA EoR team, CIRA engineering staff and existing Global Signal programs to deliver the prototype array, as a science-quality test instrument for larger Global Signal projects. The position is available from January 2019 for a duration of four years.</p> <p>The Research Fellow will work with project leader Assoc. Prof. Cathryn Trott and other global signal and instrumentation expertise at CIRA, to perform a global EoR signal experiment using short-spacing leaked total power signal. The Fellow will lead the development of a prototype array of 15-20 closely-space dipoles, with full signal digitisation, including design of the array layout, signal chain and power requirements. Aspects of this instrumentation development will be supported by existing instrumentation and antenna-design expertise at CIRA. The Fellow will then undertake science observations and analysis of data from the array, with the aim to detect global signal power from the first billion years of the Universe. The prototype array will be co-located with the Murchison Widefield Array at the Murchison Radioastronomy Observatory, a radio-quiet zone in the Western Australian desert. Cross-correlation measurements with the MWA will allow for system calibration and benchmarking.</p> <p>The incumbent of this position will require a PhD in radio astronomy or radio engineering. It is expected they will have good knowledge of radio astronomy instrumentation and data analysis. Experience with low-frequency radio interferometers, dipole arrays, and/or global signal experiments would be advantageous.</p> <ul style="list-style-type: none"> <li>• The Fellow will: <ul style="list-style-type: none"> <li>○ <i>Design and build a prototype dipole array for conducting short-spacing cross-correlation observations of the low-frequency sky, including array layout, signal chain and power requirements</i></li> <li>○ <i>Design and conduct science observations with the prototype array to calibrate the instrument and extract total power signal</i></li> <li>○ <i>Analyse data to extract a global neutral hydrogen signal, or constraints on such, from the Cosmic Dawn and Epoch of Reionisation</i></li> <li>○ <i>Develop and maintain effective relationships with key internal and external stakeholders.</i></li> <li>○ <i>Present results in high-quality journals and at relevant workshops and conferences</i></li> <li>○ <i>Supervise undergraduate and HDR students, and contribute to the general EoR Research Group and ICAR science programs.</i></li> </ul> </li> </ul>	
<b>ORGANISATIONAL UNIT DIMENSIONS</b>	
<p>The Curtin Institute of Radio Astronomy (CIRA) comprises more than 50 staff and PhD students, primarily focused on radio astronomy research, but also spanning many other aspects of observational astronomy, radio astronomy engineering, applications of high performance computing in astronomy, and astrophysics theory (including simulation).</p> <p>CIRA comprises one half of the International Centre for Radio Astronomy Research (ICRAR) Joint Venture with The University of Western Australia, as well as being a node of the ARC Centre of Excellence for All-sky Astrophysics (CAASTRO) and ARC Centre of Excellence for All Sky Astrophysics in 3 Dimensions (ASTRO 3D). CIRA researchers maintain excellent linkages with these and other national and international groups, and, in addition CIRA has excellent access to the new \$80M Pawsey Supercomputing Centre.</p> <p>This Fellow position is supported through an Australian Research Council Future Fellowship program, which aims to unveil signals from the Cosmic Dawn and Epoch of Reionisation through innovative instrumentation and algorithms.</p>	

CIRA is at the forefront of low frequency radio astronomy research as the manager and operator of the Murchison Widefield Array (MWA) ([www.mwatelescope.org](http://www.mwatelescope.org)) The MWA is an SKA precursor facility; it is fully operational, undertaking a number of important science programs spanning Galactic and extragalactic radio astronomy, pulsars, transients, the Epoch of Reionisation, solar and ionospheric physics, as well as radio astronomy engineering. The results of these programs also contribute to the design process for SKA\_LOW ([www.skatelescope.org](http://www.skatelescope.org)).

CIRA has an active and successful research group in the area of Epoch of Reionisation, playing major roles in the MWA and future SKA EoR programs. The Research Fellow will join this growing research group at CIRA, contributing to and helping to direct its research activities, and supervising undergraduate and postgraduate students.

For more information see: <http://astronomy.curtin.edu.au/>

#### KEY PEOPLE INTERACTIONS

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| <ul style="list-style-type: none"><li>• Assoc. Prof. Cathryn Trott</li><li>• Assoc. Prof. Randall Wayth (Engineering)</li></ul> | <ul style="list-style-type: none"><li>• CIRA Engineering group</li><li>• Dr Adrian Sutinjo</li></ul> |
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#### WORK REQUIREMENTS

- Interstate and/or overseas travel may be required.
- Ability to work outside of normal offices hours when required

<b>Title:</b>	Research Fellow		
<b>Work Function:</b>	Research Only	<b>Category:</b>	Research Academic (RA)
<b>Level</b>	ALB		
<b>Date last updated:</b>	September 2016		

### 1. Purpose of Position

This role contributes primarily to research based activities, conducting nationally competitive research, either independently or as part of research team, as well providing a significant contribution to service and leadership. Limited teaching may also be undertaken as part of the role.

The incumbent is expected to have a growing profile in research and service/leadership. They are likely to coordinate or lead the work of other staff.

### 2. Accountabilities and Responsibilities may include:

#### Leadership & Service

- Contribute to the development of a collegial and supportive working environment.
- Contribute to academic service and leadership, engagement and management within the University
- Provide leadership and foster and promote relationships with professional bodies, industry and affiliated associations, government departments, and the wider community.
- Participate in professional body and other external activities as required.
- Model a high standard of professional behavior consistent with the University Code of Conduct and Vision, Mission and Values.

#### Research

- Undertake nationally competitive and high quality research in discipline/field.
- Develop a coherent program of research (to be agreed through WPPR process).
- Participate in and act as co or chief investigator in applications for competitive funding.
- Disseminate research findings through seminars, workshops and conferences
- Publish/exhibit in high quality refereed journals/outlets in manner consistent with disciplinary practice.
- Provide effective supervision of research honours, research masters, and research doctoral students.
- Aspire to be recognized nationally for research in the field.
- Undertake administrative functions associated with research activities.

## Teaching

- Participate in the delivery of research led educational programs as required by the Head of School.

## Other

- Undertake other activities associated with the organizational area, which the incumbent might reasonably be expected to do, and which are consistent with the specific accountabilities and responsibilities outlined above.
  - Engage in appropriate professional development and mentoring programs.
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## 3. Compliancy and Legislative Requirements

### Occupational Safety and Health

All supervising staff are required to undertake effective health and safety measures to ensure compliance with the Occupational Safety and Health Act 1984 and related legislative requirements.

All staff must comply with requirements of the Occupational Safety and Health Act and all reasonable directives given in relation to health and safety at work, to ensure compliance with University and Legislative health and safety requirements.

### Ethics Equity and Social Justice

All staff are responsible for informing themselves of their obligations and responsibilities in relation to Ethics, Equity and Social Justice. In particular, all staff must demonstrate appropriate and professional workplace behaviours in accordance with the University's Values and Code of Conduct.

**Staff must familiarise themselves and comply with all other University policies and procedures and legislation relevant to the position.**

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## 4. Selection Criteria

***Applicants are not required to address each element of the selection criteria, but should provide sufficient information in their application to enable the selection panel to make an informed assessment of their suitability for the role.***

**Applicants need to consider Curtin's Values and how they apply to the advertised position. Curtin is looking for a demonstrated commitment in their professional and/or personal life to the Values of Curtin which are:**

- **Integrity – to act ethically, honestly and with fairness**
- **Respect – to listen, value and acknowledge**
- **Courage – to lead, take responsibility and question**
- **Excellence – to strive for excellence and distinction**
- **Impact – to empower, enable and inspire**

**Essential**

1. A doctoral qualification in relevant discipline.
2. Evidence of a record of research outputs/creative works in high quality refereed journals/outlets consistent with the discipline.
3. Evidence of quality and impact of research outputs/creative works including journal ranking, citation indices, patents awarded, reputation and standing of publishing house or other outlets, independent review from distinguished scholars or critics, or equivalent esteem measures as appropriate to the discipline.
4. Demonstrated high level communication and interpersonal skills with a commitment to the development of a collegial and supportive working environment and the ability to interact with students and staff with cross cultural sensitivity.
5. Demonstrated commitment to applying relevant and applicable policies, procedures and legislation in the day-to-day performance of the functions of this position.

**Desirable**

1. Commitment to quality teaching at undergraduate and postgraduate level.
2. Demonstrated ability to supervise HDR students
3. A history of successful competitive grant applications.

**5. Capabilities and Behaviours (Curtin Leadership Framework)**

It is a requirement that staff in leadership roles exhibit and model capabilities and behaviours consistent with the Curtin Leadership Framework (see [http://odu.curtin.edu.au/curtin\\_leadership\\_framework.cfm](http://odu.curtin.edu.au/curtin_leadership_framework.cfm) ). These include:

Managing Self	Leading Others	Leading Innovation & Change	Leading Strategically	Managing Operations
Understanding self & others	Building & leading high performance teams	Thinking creatively & fostering innovation	Thinking strategically & having vision	Managing Curtin resources
Modelling Curtin Values	Developing staff capability	Managing change	Setting goals & objectives	Continuous quality improvement
Managing time and wellbeing	Facilitating participative decision making	Influencing and inspiring others	Thinking analytically to solve problems	Managing complex projects
Building working relationships	Dealing with conflict			
Effective Communication				