THE UNIVERSITY OF WESTERN AUSTRALIA

POSITION DESCRIPTION

Position Title	Research Associate (TeraNet Communications Systems Academic)
Classification	Level A
School/Division	Office of the Deputy Vice Chancellor (Research)
Centre/Section	International Centre for Radio Astronomy Research (ICRAR)
Supervisor Title	Principal Research Fellow
Supervisor Position Number	318215
Position Number	New

Your work area

ICRAR is a WA State funded high profile equal joint venture established in 2009 between Curtin University and The University of Western Australia (UWA). The Centre's headquarters are located at UWA, with research nodes at both UWA and Curtin. ICRAR has been funded with $25 Million by the WA State Government and $35 Million contribution from the Joint Venture Universities till 2024.

The Astrophotonics Group at ICRAR is focused on designing, building, and testing advanced photonic systems with applications in radio astronomy, optical astronomy, and space science. The group combines research expertise from people with a broad range of backgrounds including astronomy, physics, and engineering. The group's core technological capability is the long-distance transfer of stabilised optical-frequency signals, microwave-frequency signals, timing signals and communications signals, transmitted across optical fibre networks and free-space laser links.

Your work will contribute to the 'TeraNet' project, which aims to establish a three-node optical communications ground station network in Australia. This network will support multiple international space missions operating between low-earth orbit and the Moon, using both conventional optical communications standards (O3K), as well as more advanced optical technologies including deep-space (HPE) communication, ultra-high-speed coherent communications (n-QAM), quantum-secured communications, and optical positioning and timing. The TeraNet network comprises a 0.7m ground station optimised for research and development at UWA, a second 0.7m ground station to be located at the Mingenew Space Precinct (300km North of Perth), and a 0.4m mobile ground station to be commissioned at ESA's New Norcia facility.

We support flexible work arrangements to allow people to align their work duties with their family's requirements and personal wellbeing. TeraNet is a project with global reach, so we do have to attend meetings after hours and there will be the occasional field deployments, and national and international travel.

Reporting structure

Reports to: Principal Research Fellow

Your role

As the appointee you will, under broad direction, undertake independent research on the communications systems to be used by the TeraNet ground station network. You will be expected work with the project team to target this research towards the objectives and outcomes of the TeraNet project.

Your key responsibilities

Conduct applied research on communications systems for the TeraNet project to help arrive at a design that maximises the compatibility of the system with current and future in-space optical payloads in coordination with the rest of the project personnel and Project Collaborators.

Assist with the team's research on both the low-earth orbit and advanced communications systems with input from the rest of the project personnel and Project Collaborators. This includes contributing to the Communications Systems Design Study, followed by the procurement, installation, integration, set-up, and testing of both commercial-off-the-shelf and custom digital communications hardware and appropriate optical sources and detection systems

Contribute to the installation and testing of these systems in combination with the network's telescope and optical systems; and then use these systems to conduct commissioning activities in coordination with our Project Collaborators and the in-space assets available to the project (including, low-earth orbit and advanced communications systems)

Establish and maintain effective working relationships with our other project personnel, including those within Project Partner and Project Collaborator organisations

Create new knowledge in discipline and disseminate it through publication in highly ranked peer reviewed journals that will enhance the reputation of the School and the University at a national and international level

Attend and contribute to relevant meetings

Other duties as directed

Your specific work capabilities (selection criteria)

PhD (or soon to be submitted) in an academic field relevant to the discipline

Research experience in free-space optical communications systems, as evidenced by a series of peer-reviewed journal articles published in high quality journals

Familiarity with optical networking, including industry standard interfaces, and digital communications appropriate for satellite communications, including industry standard formats

Familiarity with different physical layer modulation schemes (such as OOK, DPSK, QPSK, HPE) and detection schemes (e.g. direct detection, intradyne, heterodyne)

Familiarity with link reliability techniques including forward error correction and interleaving, and retransmission protocols such as automatic repeat request

Excellent written and verbal communication skills

Excellent organisational skills with the demonstrated ability to set priorities and meet deadlines

The ability to work independently, show initiative and work productively as part of a team

Special requirements (selection criteria)

Occasional travel within the state will be required for field deployments

Occasional domestic and international travel may be required

Some after-hours work will be required to attend meetings across time zones

Compliance

Ensure you are aware of and comply with legislation and University policy relevant to the duties undertaken, including:

The University's Code of Conduct hr.uwa.edu.au/policies/policies/conduct/code/conduct

Inclusion and Diversity web.uwa.edu.au/inclusion-diversity

Safety, health and wellbeing safety.uwa.edu.au/