THE UNIVERSITY OF WESTERN AUSTRALIA

POSITION DESCRIPTION

Position Title	The Jim Buckee Fellow in Astrophysics
Classification	Level A
School/Division	Office of the Deputy Vic Chancellor (Research)
Centre/Section	International Centre for Radio Astronomy Research (ICRAR)
Supervisor Title	Professor
Supervisor Position Number	309822
Position Number	FSR

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.

ICRAR is one of the largest astronomy institutions and one of the lead Australian organisations participating in the international Square Kilometre Array (SKA) Project. ICRAR has secured multimillion dollar contracts to participate in the SKA software development, SKA-Low power and signal distribution system and SKA-MID phase synchronisation system for the SKA construction period until 2028.

UWA graduate Dr Jim Buckee, who gained a BSc Honours at UWA in 1967 and a PhD in Astrophysics at Great Britain's Oxford University in 1970, has generously endowed a new research position at UWA that will play a key role in the SKA project.

Reporting structure

Reports to: Professor Chris Power

Your role

As the successful appointee under broad direction, you will contribute to an independent research program aimed at undertaking research in supercomputer modelling of the formation and evolution of galaxies in the cosmic web. You will be making predictions that can be directly tested with next generation radio telescopes such as the SKA and its precursors/pathfinders.

Over the coming decade, large surveys on cutting-edge radio telescopes, culminating with the Square Kilometre Array (SKA), will provide unique insights into the distribution of gas on both galactic and cosmological scales over the last several billion years of cosmic time. The results of these surveys will revolutionize our understanding of the physical processes that drive galaxy formation and evolution, including star formation and feedback from stars and accreting super-massive black holes, while also revealing, for example, the fate of the so-called missing baryons in the cosmic web.

Cosmological galaxy formation simulations provide a powerful tool for the design and interpretation of these surveys, and efforts are underway at ICRAR-UWA to develop both the simulations and analysis framework to support these surveys.

You will play a key role in carrying out an independent and innovative research programme using galaxy formation modelling in cosmological simulations on state-of-the-art supercomputers to make predictions that can be tested using observational data from the SKA pathfinders, such as ASKAP, and the ultimately the SKA itself.

ICRAR astronomers have access to the nearby Pawsey supercomputing centre, home to the Setonix supercomputer, which is one of the top 15 supercomputers in the world (as of November 2022), as well as a wide range of observational facilities (including ESO facilities, ATCA and ASKAP).

Your key responsibilities

Generate and analyse cosmological simulations of galaxy formation and evolution in the cosmic web

Construct synthetic observables from simulations to compare with current and future galaxy surveys

Undertake world-class scientific research

Publish results in international journals of repute

Supervise higher degree students

Other duties as directed

Your specific work capabilities (selection criteria)

PhD in theoretical/computational astrophysics or related discipline

Excellent knowledge of, and demonstrated ability to work with, cosmological hydrodynamical

Excellent computing and data management skills

Experience in high performance computing

Excellent verbal and written communication skills

Strong publication record evidenced by international refereed publications

Ability to participate effectively in distributed scientific collaborations

Good planning and organisational skills

Ability to contribute to outreach and/or educational programmes

Ability to work independently, show initiative, problem solve and work productively as part of a team with colleagues and students

Special requirements (selection criteria)

Occasional overseas travel

Some after-hours work may be required

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/