



Introduction

This poster presents recent developments in radio astronomy at UoA-Astro Madagascar, focusing on galaxy evolution and cosmology.

Our research integrates:

- MeerKAT / SKA precursor surveys
- Multi-wavelength archival datasets
- Numerical simulations (SIMBA, MUFASA, etc.)
- Machine learning techniques for galaxy classification and structure analysis

We explore synergies with ALMA Band 2 (67–116 GHz) to probe:

- Cold molecular gas
- Early star formation
- Dense environments in galaxy clusters

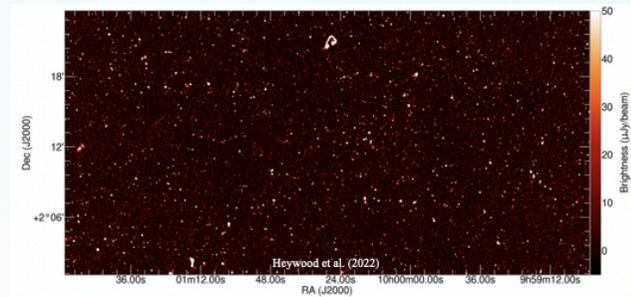
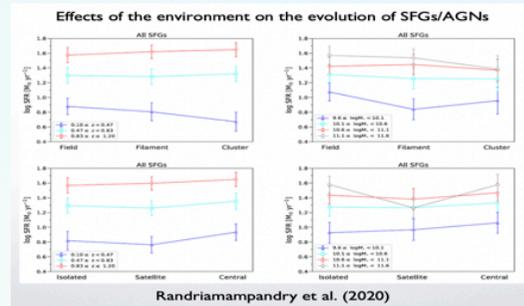
Method and Results

Radio Continuum & Environmental Studies

- Star formation in galaxy clusters
- AGN–environment interaction
- Evolution of Luminous Compact Blue Galaxies (LCBGs)
- Environmental quenching and triggering mechanisms

Simulation Work

The simulations help interpret radio continuum observations and connect physical processes across cosmic time.



MeerKAT-ALMA Synergy

MeerKAT (0.9–1.67 GHz)

- Synchrotron emission
- AGN activity
- Large-scale structure mapping
- Environmental effects on star formation

ALMA Band 2 (67–116 GHz)

- Molecular gas (CO lines)
- Cold gas reservoirs
- Early star formation in dense environments

Together MeerKAT + ALMA provide a complete evolutionary picture of galaxies by combining:

- Radio continuum (SF + AGN)
- Molecular gas (fuel for star formation)
- Environmental diagnostics

Future work & Prospects

- Capacity-building programmes in radio astronomy
- Student training and postgraduate supervision
- Strengthening African and international collaborations
- Developing Madagascar's long-term radio astronomy infrastructure

Acknowledgments

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