

**Topic:** Radio Astronomy (5 lectures)

**Lecturer:** Dr James Chibueze

**Description:** An introduction to the fundamentals of radio astronomy and radio interferometry. The emission processes, their detection techniques as well as hands-on 'lecture' on radio astronomical data handling will be covered.

**Syllabus:**

**Lecture 1: Radio waves and emission and their properties**

- Continuum emission
- Spectral line emission
- Properties of radio signal

**Lecture 2: Radio telescopes**

- Antenna beams
- Feed Systems
- Antenna efficiency
- Operation principle of radio telescopes

**Lecture 3: Single-dish radio telescope**

- Sample science cases and techniques
- Pointing, bandpass, point source sensitivity
- Sample data processing

**Lecture 4: Fundamental of radio interferometry**

- Aperture synthesis
- Very long baseline interferometry

**Lecture 5: Radio interferometric data processing**

**Software:** UNIX OS pcs (laptops) with python and CASA 5.6.2 installed.

**Bibliography**

\* Burke, Graham-Smith, Wilkinson, An Introduction to Radio Astronomy (4th ed)

\* Thompson, Moran, Swenson Jr, Interferometry and Synthesis in Radio Astronomy (3rd ed)