

Topic: Stellar Structure and Evolution

Lecturer: Itumeleng Monageng

Description: The course will introduce fundamental concepts that explain the observational signatures of stars. A detailed look at the life cycle of stars will be considered, from the collapse of an interstellar cloud to the final products of stellar evolution. The physics of the different classes of interacting binary stars will be covered.

Syllabus:

Lecture 1:

- * Celestial mechanics
- * The continuous spectrum of light

Lecture 2:

- * Spectral lines
- * Photons
- * Quantum mechanics and wave-particle duality

Lecture 3:

- * Formation of spectral lines
- * The Hertzsprung-Russell diagram
- * Stellar atmospheres

Lecture 4:

- * Interiors of stars
- * Interstellar medium and star formation
- * Main sequence and post-main-sequence stellar evolution

Lecture 5:

- * The degenerate remnants of stars
- * Close binary stars