AS4010 - Extragalactic Astronomy

Credits: 15.0  Semester: 1
Number of Lectures: 27  Lecturer: Dr Vivienne Wild and Prof Keith Horne
Academic Year: 2016-17

Overview
This module introduces the basic elements of extragalactic astronomy and observational cosmology. This includes the morphology, structural and spectral properties of star-forming and quiescent galaxies along the Hubble sequence. We study how galaxy populations change and how the distant galaxies in the early Universe evolve in the galaxies we observe today in our local neighbourhood. We follow the growth of the super massive black holes in the centres of galaxies, and their phases as Active Galactic Nuclei. Galaxy formation theory is introduced in relation to the growth of structure in a cold-dark matter cosmology, and we investigate the role that high and low-density environments play in galaxy evolution. This module includes a look at main surveys and instruments, used in modern extragalactic research.

Guest lectures will be given by various researchers from our galaxy evolution group, to provide a link between the material covered in the lectures, and research currently undertaken at the University of St Andrews.

Aims & Objectives
To be able to appreciate the various aspects of galaxy formation and evolution, and apply them to outcomes of modern extragalactic research activities.

Learning Outcomes
- be able to obtain galaxy properties from observational evidence
- be able to describe the differences in galaxy populations and properties over the course of the Universe in terms of galaxy evolution
- be able to describe the formation of galaxies in terms of observational cosmology
- be able to apply basic physical principles to galaxy evolution and formation processes
- be able to apply material covered in the lectures to current research activities in extragalactic astrophysics

Synopsis
Galaxy Observations: Spectral Energy Distributions and Star Formation Histories
Galaxy Observations: Scaling Laws and Dynamics
Observational Cosmology
Galaxy Formation and Evolution
Supermassive Black Holes and Active Galactic Nuclei
Galaxies and Environment

Pre-requisites
AS2001 or AS2101, PH2011, PH2012, MT2001 or (MT2501 and MT2503)

Anti-requisites
None

Assessment
Coursework 20%, Written Examination = 80 %

Additional information on continuous assessment etc
Coursework involves a Class Test (10%) and a comprehension essay (10%).

Accreditation Matters
This module may not contain material that is part of the IOP “Core of Physics”, but does contribute to the wider and deeper learning expected in an accredited degree programme. The skills developed in this module, and others, contribute towards the requirements of the IOP “Graduate Skill Base”.

Recommended Books
Please view University online record:
http://resourcelists.st-andrews.ac.uk/modules/as4010.html

General Information
Please also read the general information in the School's honours handbook.