

Advanced Stellar Evolution (L16)

Non-Examinable (Graduate Level)

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We will proceed with the investigation of further aspects of stellar structure and evolution following on from the course “Structure and Evolution of Stars” in the Michaelmas Term.

The only way we know how to form heavy elements is through stellar processes. Thus stars are central in building the world around us. Insights into the structure and evolution of stars rely on a mathematical description of the physical processes which determine the nature of stars. The only way in which we may test stellar structure and evolution theory is through the comparison of theoretical results to observations.

The main subjects to be covered will be an introduction to asteroseismology, stellar rotation, as well as further details regarding mass loss from stars and some examples of stellar models. All these are essential if we endeavour to understand, interpret and study current observational data.

Prerequisites

Some understanding of hydrodynamics, electromagnetic theory, thermodynamics, nuclear physics, quantum mechanics as well as theory of structure and evolution of stars, although a detailed knowledge of all of these is not necessary.

Literature

1. Kippenhahn, R. and Weigert, A. *Stellar Structure and Evolution*, Second Edition, Springer-Verlag, 2012.
2. Cox, J. P. and Giuli, R. T. *Principles of Stellar Structure*, Gordon and Breach, 1968.
3. Padmanabhan, T. *Theoretical Astrophysics*, Volume II: Stars and Stellar Systems, Cambridge University Press, 2001