

# Further Stellar Structure and Evolution (L16)

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We will continue with the investigation 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 nuclear processes in stars in both their steady evolution and in their possible final catastrophic moments. 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 their nature. Stellar structure and evolution theory can then be tested through the comparison of theoretical results to observations.

We will discuss an introduction to asteroseismology and to stellar rotation, further details regarding mass loss from stars as well as some examples of stellar models and also a bit more about nuclear processes. 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
4. Eldridge, J. J. and Tout, C. A. *The Structure and Evolution of Stars*, World Scientific, 2019.