introduction

The lives of stars are dominated by their battle against the tendency to collapse under gravity. In a main-sequence star, the internal pressure is high enough to balance gravity completely and the centre of the star is hot enough for nuclear reactions to provide a source of energy to balance the steady leakage of energy from the star by radiation from the surface.

When all of the hydrogen at the centre has been burned, the nuclear reactions cease and the star must find an alternative source of energy to balance the surface luminosity. Initially, the only available source is gravitational potential energy and the star draws on this by beginning to contract. The central temperature eventually increases to the point at which helium begins to burn, providing a new energy source and a new equilibrium, which lasts until the helium is exhausted. Further nuclear fuels are only available to the highest-mass stars, which can go on to burn carbon and other elements.

In what follows, we will take a qualitative look at the lives of stars of all masses, dividing the discussion between low-mass stars, which we will define as all stars with $M \leqslant 1.1\ M_{\odot}$, and higher-mass stars. We will then describe the endpoints of stellar evolution - white dwarfs, neutron stars and black holes. Finally, we will look at how the lives of stars are modified if they are members of a close binary system.