

Stellar Evolution

Physics

How a star's mass decides its whole life and its end.

Fate by initial mass.

Initial mass	Ends as	Via
< 0.5 M_☉	White dwarf (helium)	Slow cooling
0.5–8 M_☉	White dwarf (carbon-oxygen)	Planetary nebula
8–20 M_☉	Neutron star	Core-collapse supernova
> 20 M_☉	Black hole	Core collapse

More massive stars burn far faster: a 20 M_☉ star lives a few million years, while the Sun lasts ten billion.