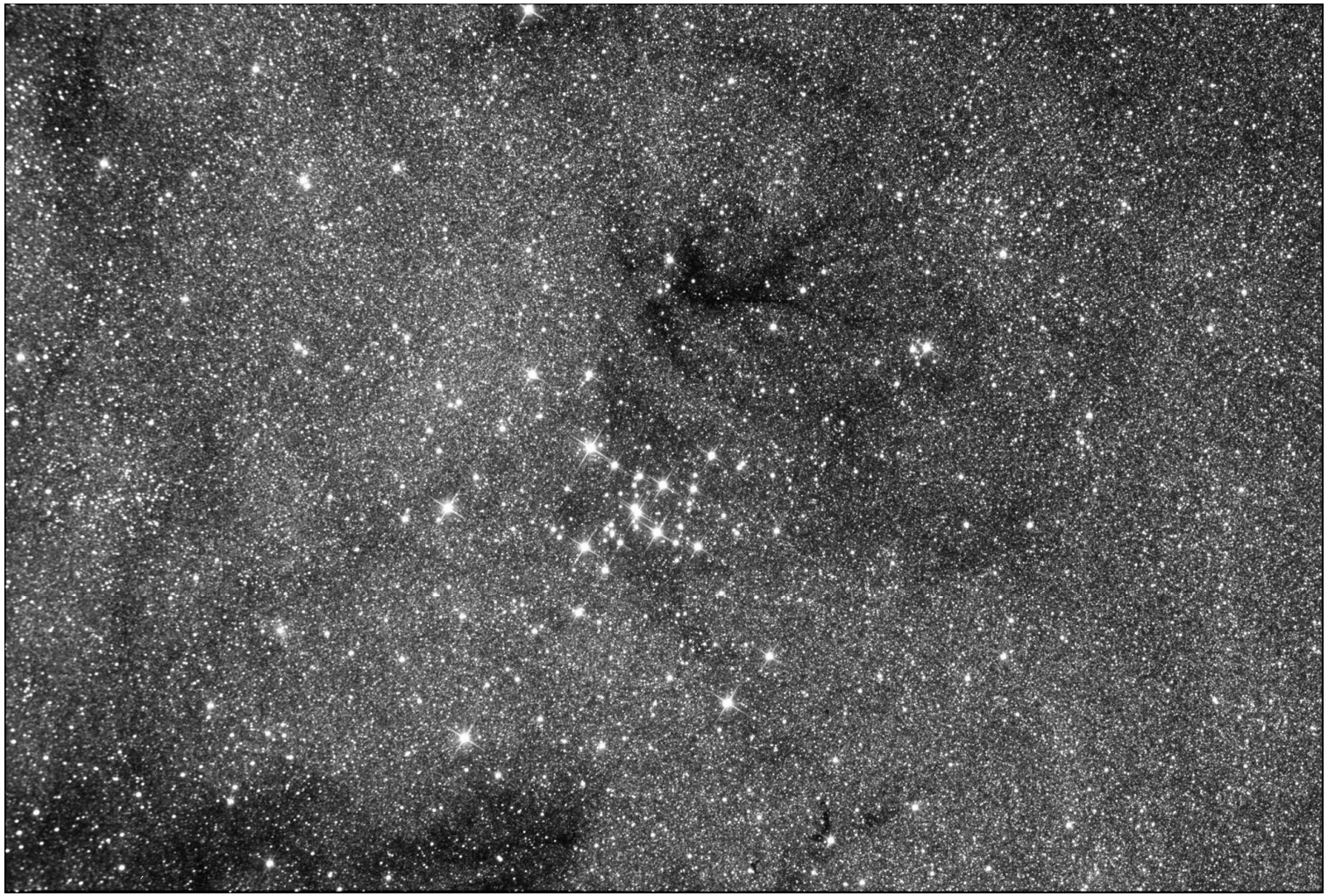
Lecture 27: Astronomy Picture of the Day



M87:open clusters of stars, 1000 lyr away, in constellation Scorpius. Spans 25 lyrs across
Already noted by greek astronomer Ptolemy in the year 130 AD.
Contains about 100 stars in total, and is about 200 million years old. Note blue hot massive stars!
Dark dust cloud to the bottom left = millions of unrelated stars towards the Galactic center.

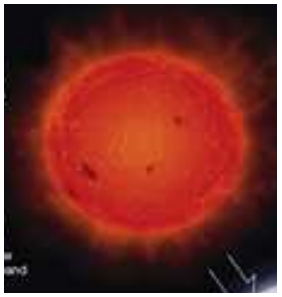
Lecture 27: Announcements

1) 10 min quiz today based on reading assignement, Ch 17

2) Quiz on Wed Apr 13 based on reading assignment
   Ch 20, Galaxies: From Here to the Horizon (Cosmic Perspectives, 3rd Ed)
   Main ideas in “Summary of Key Concepts” at end of chapter.

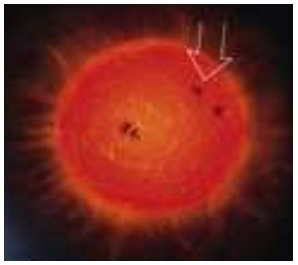
Evolution of high-mass ($M>8M_o$) stars

Blue main sequence star. H fusion in core via CNO cycle

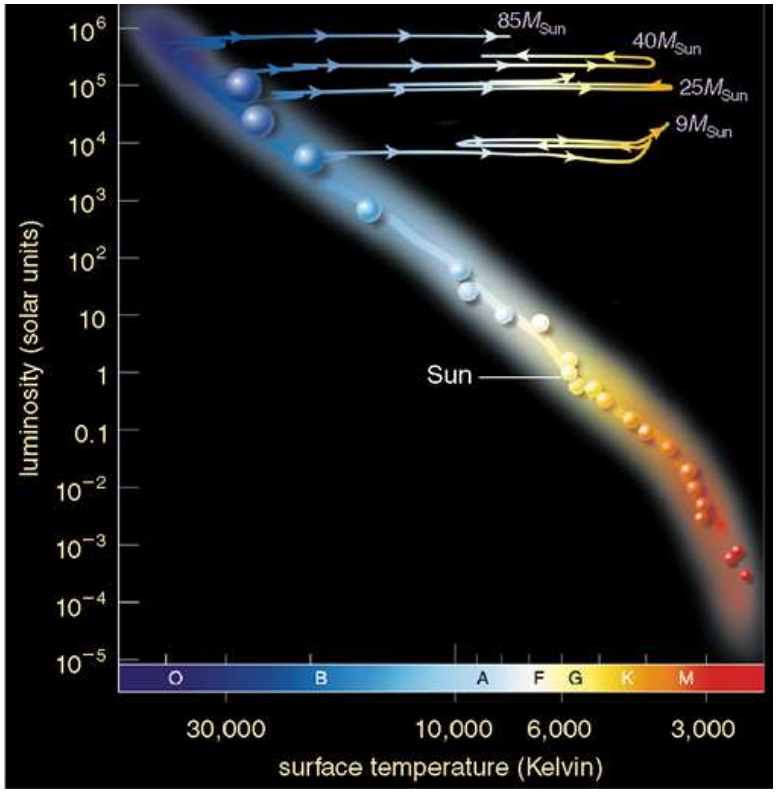


Red supergiant:
Inert He core
H-burning shell

'Blue' supergiant:
He-burning core +
reduced H-burning
in shell

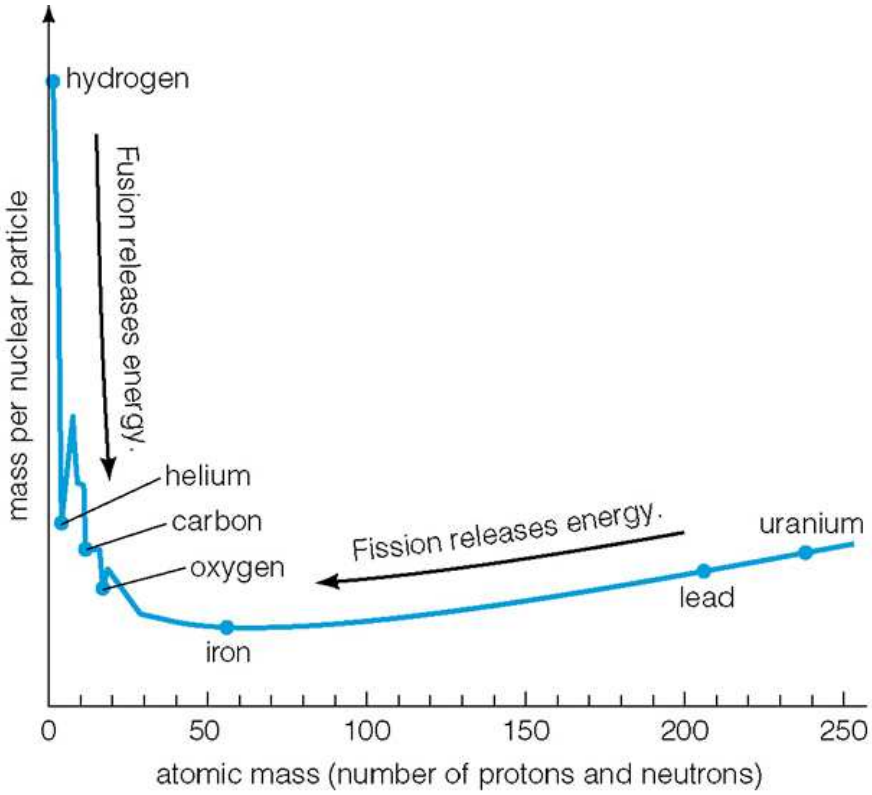


Supergiant phases.
Inert C core shrinks till fusion of C starts, then of O, then…of Si until iron collects in core.
Multiple shells burning C, O, He, H

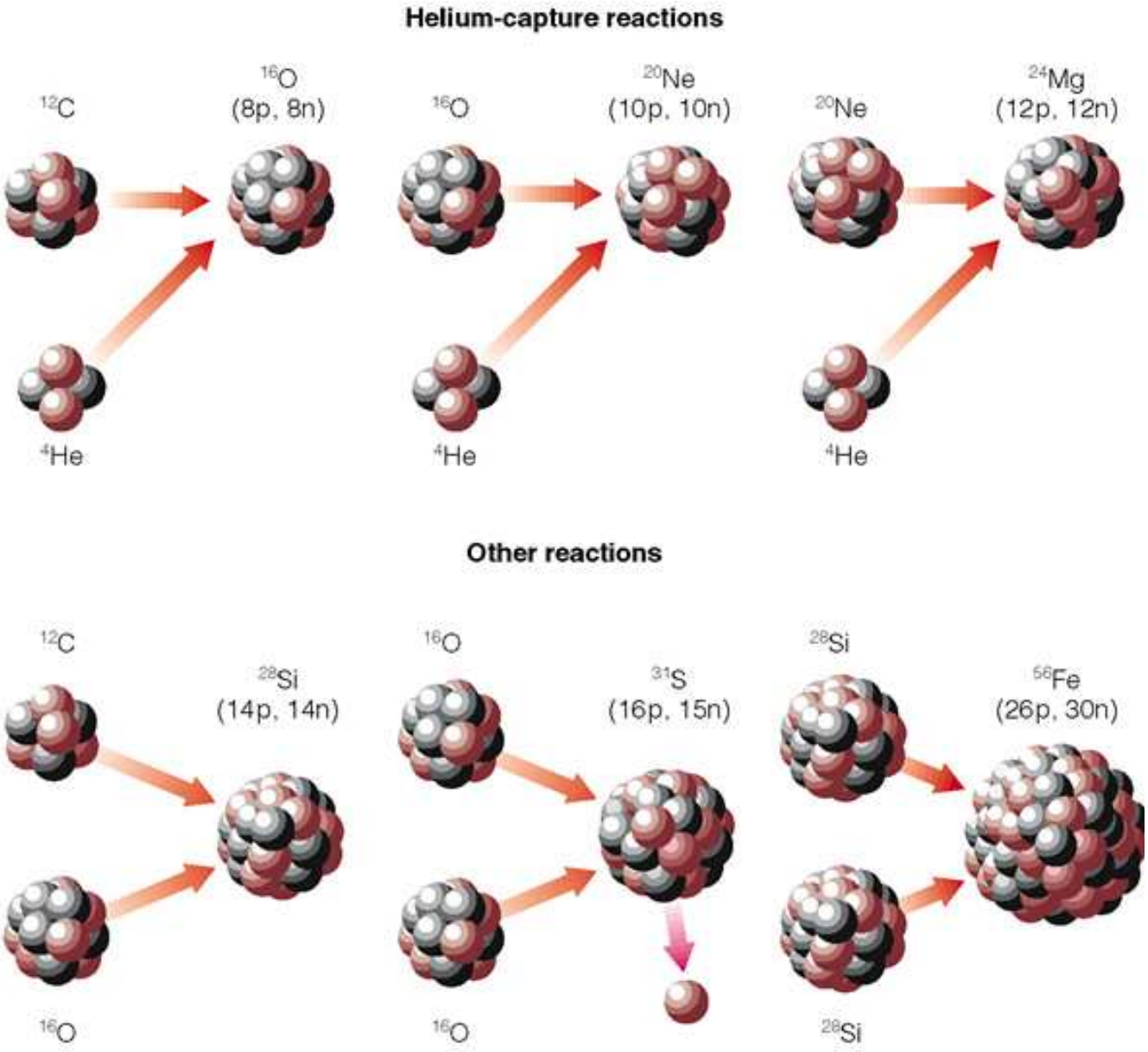


When it is no longer supported by deg-pressure, iron core collapses, and e- p+ combine to form a neutron star or BH. Star explodes outer layers into SN

Energy generation by fusion and fission of elements heavier than H



Energy generation by fusion of C He N O into Si Fe



Evolution of high-mass stars