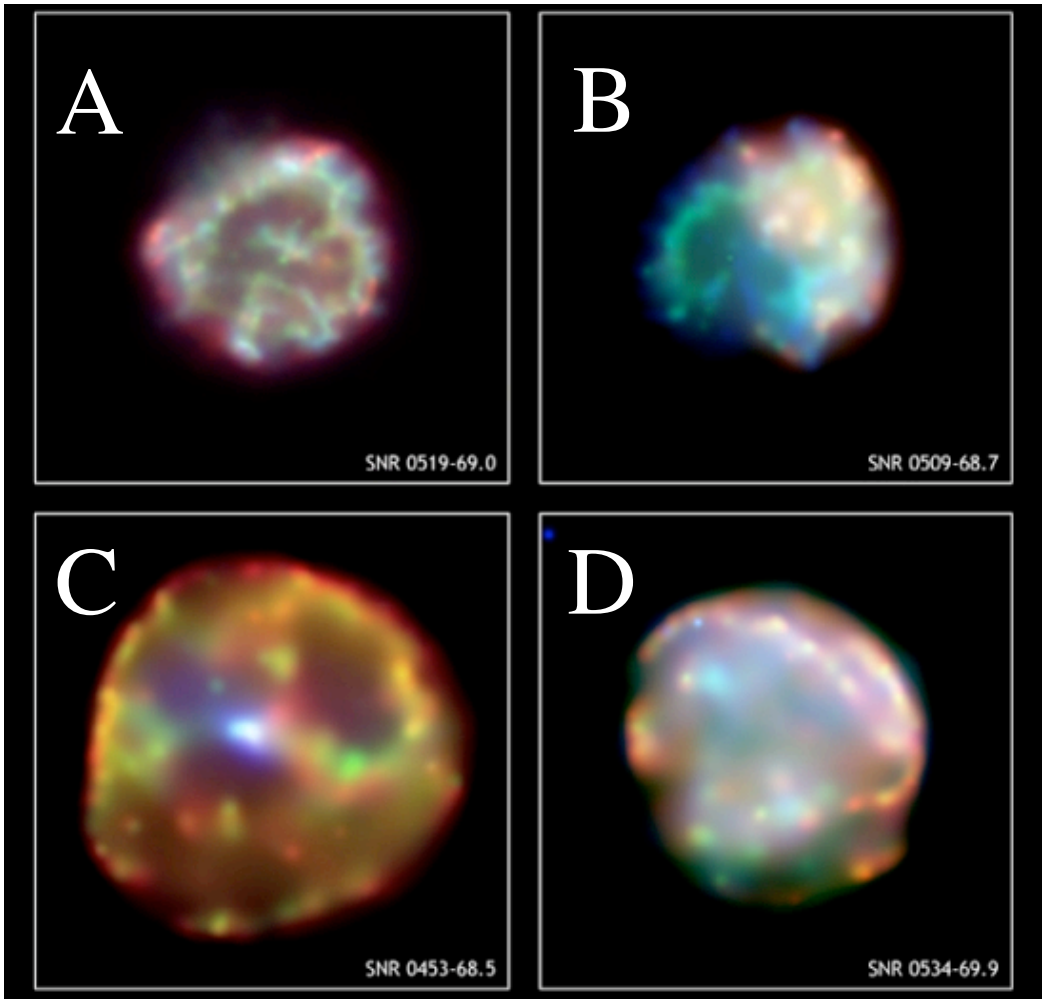
Which of the following is a remnant from a Type II SN?



Protostars are difficult to observe because:

A: The protostar phase is very short compared with the lifetime of a star

B: They are surrounded by cocoons of dust and gas

C: They radiate mainly in the infra-red

D: All of the above

There is a mass-luminosity relationship (I.e. the main sequence on the HR diagram) because

A. Stars support their weight by making energy

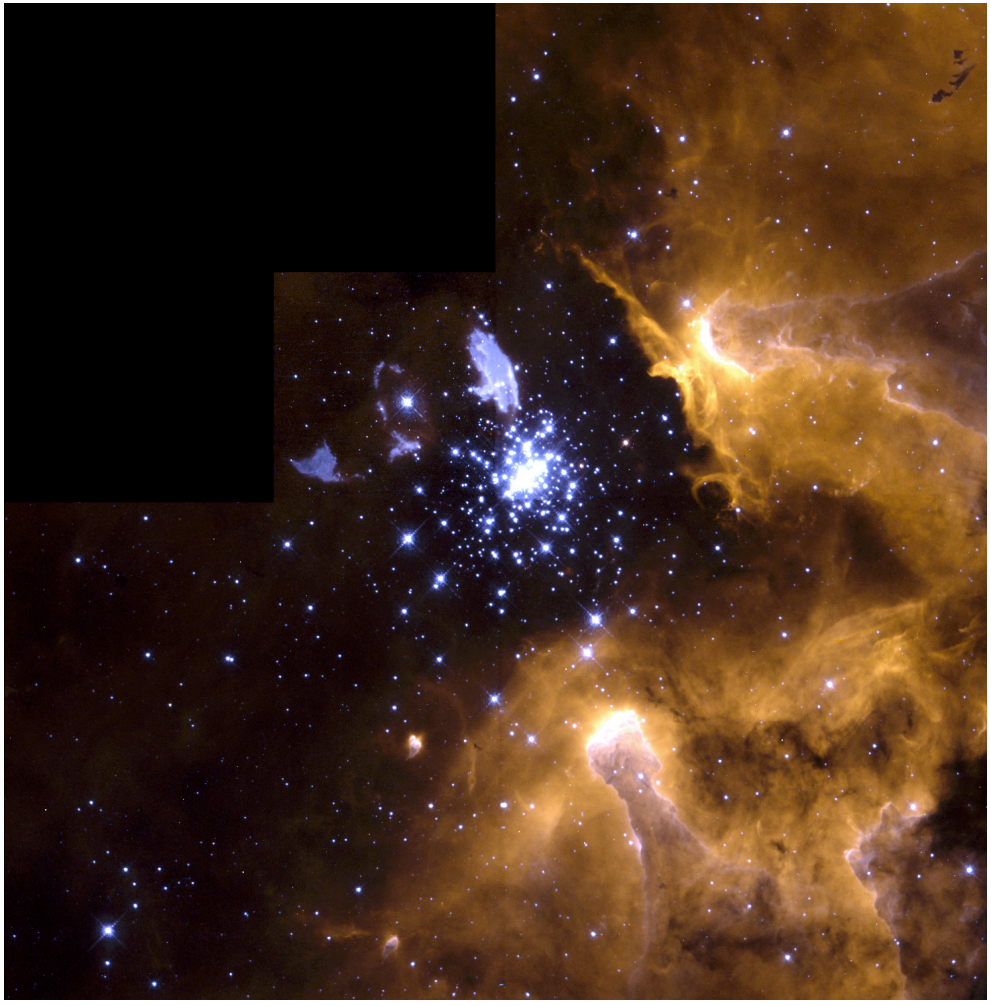
B. Hydrogen fusion produces Helium

C. Massive stars have winds which make them more luminous

D. All stars on the main sequence have about the same radius

What kind of nebula can I see in this image?

A. Emission
B. Dark
C. Reflection
D. All of the above



When a star's core gets smaller, the rest of the star usually

A. Also gets smaller

B. Stays the same

C. Gets larger

D. Explodes as a supernova

A star evolves off the main sequence when

A. Nuclear reactions begin in the core of the star

B. Hydrogen is exhausted in the core of the star

C. Hydrogen is exhausted everywhere in the star

D. Helium is exhausted in the core of the star

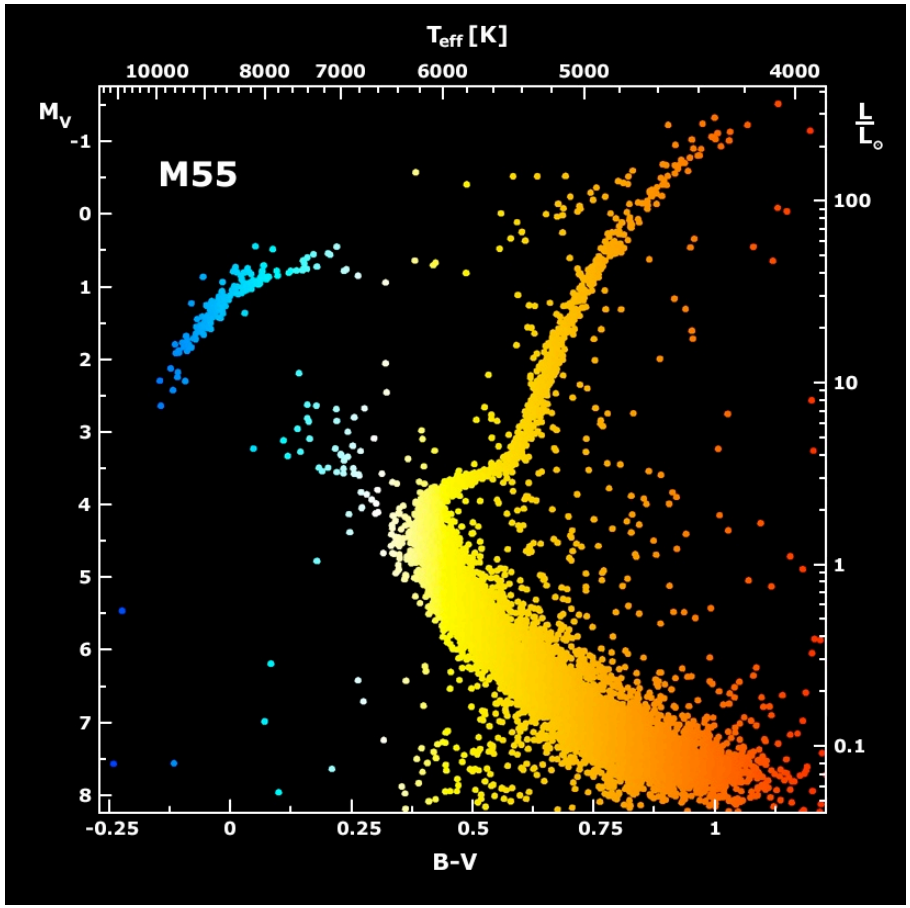
A young star cluster will have _____ than an older cluster

A. a redder turn-off

B. a bluer turn-off

C. fewer stars

D. fewer luminous stars



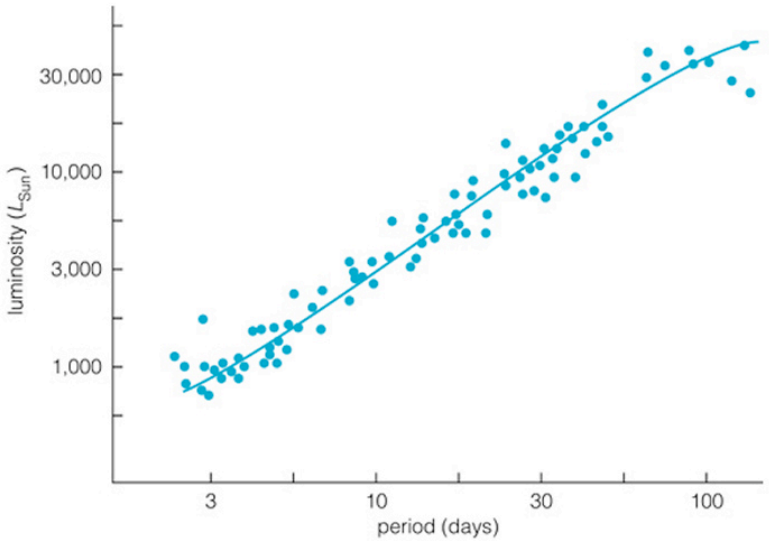
Cepheid variables are good distance indicators

A. Within about 1 light year from the sun

B. Only for star clusters in our own galaxy

C. In our own galaxy and other nearby galaxies

D. In even the most distant galaxies



The Chandrasekhar limit tells us

A. Accretion disks can grow hot through friction

B. Stars heavier than 3 solar masses are not stable

C. White dwarfs must contain more than 1.4 solar masses

D. Not all stars end up as white dwarfs

A nova is almost always associated with

A. a very massive star with a Fe core

B. a very young star

C. a star undergoing a helium flash

D. a white dwarf in a close binary

The density of a neutron star is about the same as

A. a white dwarf

B. the sun

C. an atomic nucleus

D. a water molecule

Neutron stars are expected to be very hot because

A. They collapsed, and compression has caused a rise in temperature

B. They spin rapidly, so get heated up through friction with their atmospheres

C. They are undergoing H nuclear fusion like all main sequence stars

D. They are dense enough to fuse iron, so are producing a lot more energy

Which of the following has the greatest escape velocity (no calculation required!)

$$V^2_{esc} = 2\,GM / R$$

A. The sun

B. The sun when it has become a white dwarf

C. A star twice as massive as the sun when it becomes a white dwarf

D. A star 10 times the mass of the sun when it becomes a neutron star

The event horizon of a black hole

A. is believed to be a singularity

B. is the surface between space and matter

C. has a radius equal to the Schwarzschild radius

D. is the place where gravity begins to have an effect

An isolated black hole would be very difficult to detect because

A. there would be no light source nearby

B. there would be few stars behind it whose light it could block out

C. very little matter would be falling into it

D. it would be stationary

Which of the letters on this HR diagram show these different populations:

I. The position of the youngest, lowest mass protostars

II. The point where H fusion begins for a sun-like star

III. The H burning phase of a massive star

IV. The H burning phase of a low mass star

V. The He burning phase of a medium mass star