ESS 100 (Stapleton)
Life Cycles of Very Massive Stars

Name: Key

1. For these notes, "very massive" means...

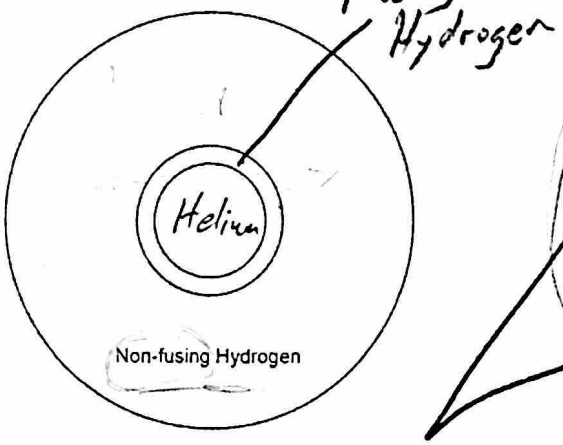
20 times the Sun's mass, or more

2. List the life stages of a very massive star.

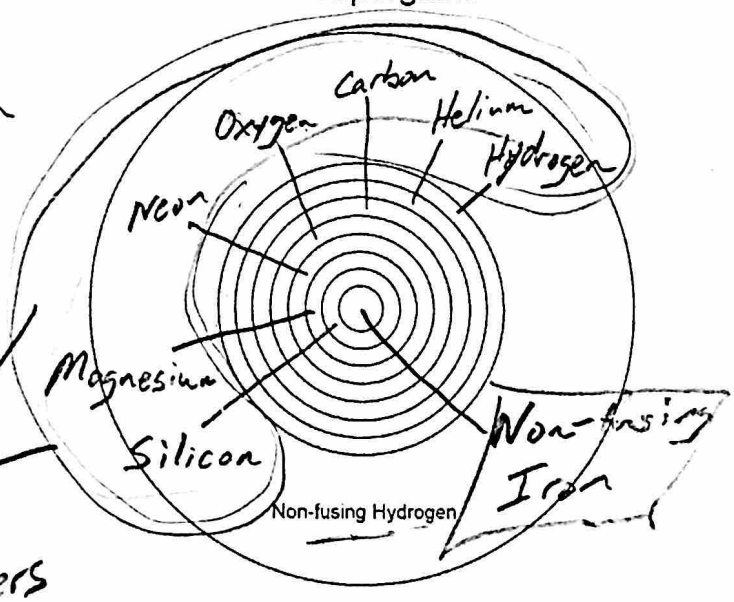
Nebula, Protostar, (Blue) Main sequence Star,
→ red supergiant, Supernova, → Blackhole
↓ → Neutron Star
Material blasted into space and recycled

3. Show how nuclear fusion in a very massive star is different than fusion in a medium star like our Sun?

Medium Star
↓
Red Giant



Massive Star
↓
Red Supergiant

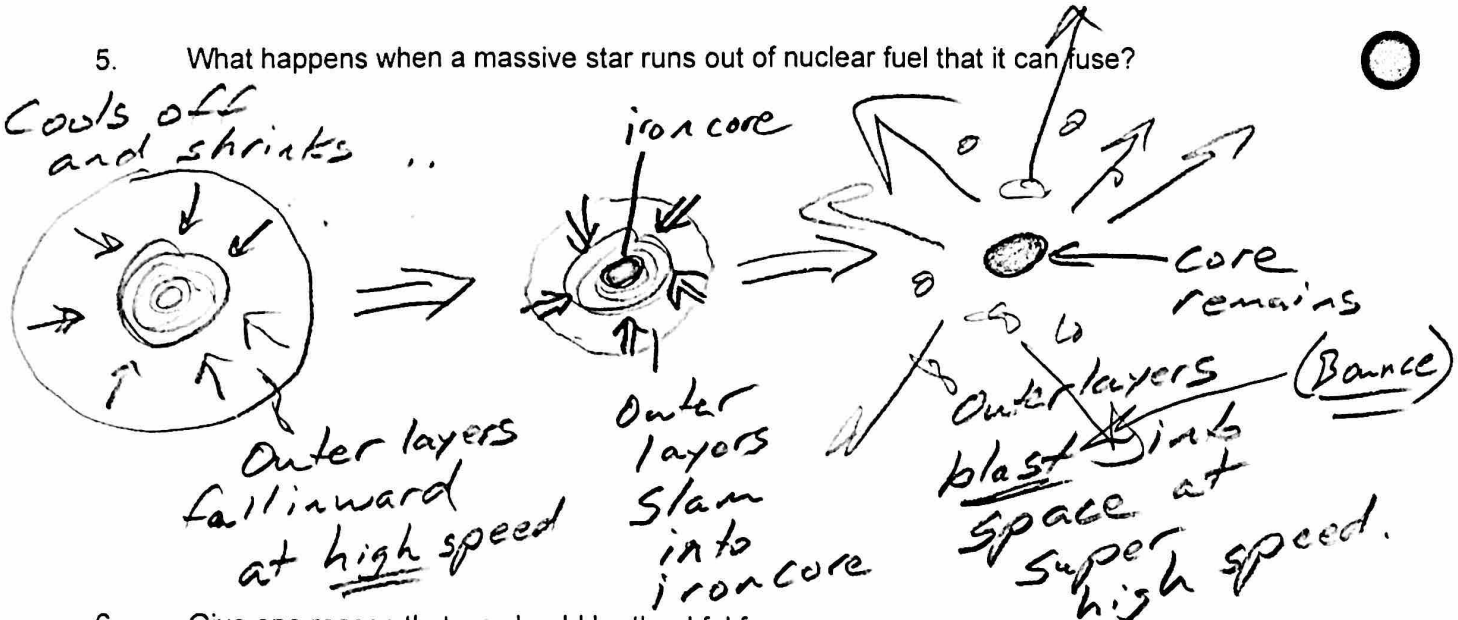


Fusion Layers

4. What is the heaviest element that can be made by nuclear fusion in a star?

Iron

5. What happens when a massive star runs out of nuclear fuel that it can fuse?



6. Give one reason that we should be thankful for supernovas.

Supernovas have enough pressure to fuse heavy elements. All elements heavier than iron were created in supernovas.

7. What happens to the star material after a supernova?

a) Some material gets blasted out into space. This material... can be recycled (incorporated into a new solar system and new beings.)

b) A black hole can form if... the remaining core is atleast 3 times the sun's mass.

c) A neutron star can form if...
the remaining core is less than 3 suns in mass.

8. Three neutron star facts
- One teaspoonful weighs as much as 900 great pyramids.
- Fastest one spins 700 times per second.
- So hot they give off mostly x rays -- not visible color