Objects in Space

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OBJECTS IN SPACE

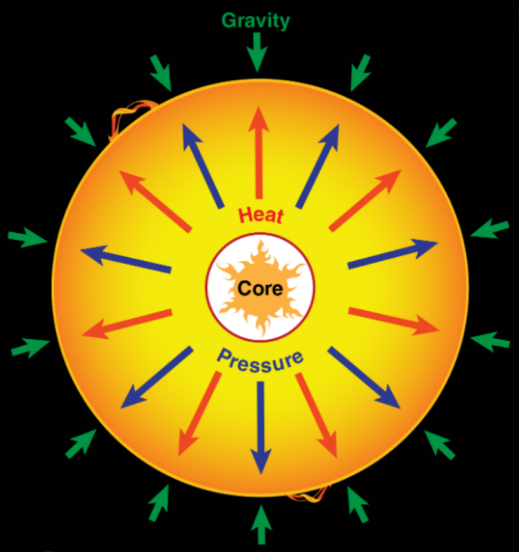
QUASAR

- Short for "quasi-stellar radio source"
- Extremely bright objects powered by supermassive black holes releasing enormous energy
- Believably, the most distant objects yet detected in Universe

SUPERNOVA

- Extremely powerful explosion; happens when a star at least 5x the mass of Sun dies
- The massive star collapses when it runs out of fuel and its pressure drops and the gravity exerted is more
- Can be so bright they outshine their entire galaxies for a few days or months

What holds a star together?



Supernova of a star 10x the Sun's size creates a stellar-mass black hole as its core

NEBULA

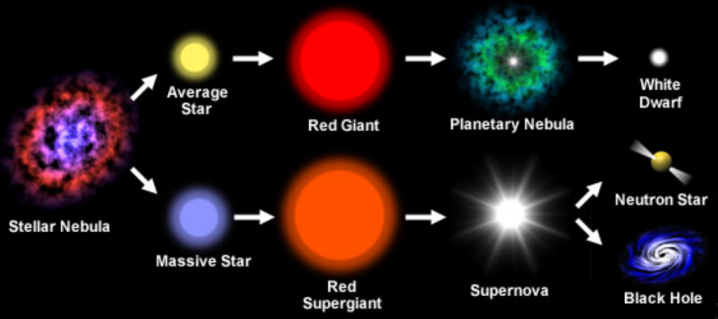
- A giant cloud of dust and gas (mostly hydrogen, helium) in space
- Forms when a star dies (supernova) or when new stars are forming
- Closest known nebula to Earth - Helix Nebula (remnant of a dying star ~700 LYs away from Earth)

NEUTRON STAR

- Formed when the core of a star collapses, crushing together every proton and electron into a neutron
  - If the star is not massive enough to produce a black hole, the neutrons stop the collapse, and a neutron star is formed
- Can be found scattered throughout the galaxy

A "kilonova" is a powerful event that happens when two neutron stars merge

Life Cycle of a Star



PULSAR

- A rotating neutron star having pulses of radiation at very regular intervals
- Most neutron stars are pulsars
- Produces strong magnetic fields and strong beams of light

MAGNETAR

- Another type of neutron star
- Magnetic field of a neutron star - 10^{12} times that of Earth's
  - Magnetic field of a Magnetar - 1000x that of neutron star's

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