Astro 10 Final Jeffardy Review

Celestial Motions

100. This is the cause of the seasons.
The tilt of Earth's axis (which causes the northern hemisphere to receive more direct sunlight in June than in December).

200. This is how solar eclipses occur. The moon moves directly between Earth and the sun.

300. This is why we see phases of the moon. The moon orbits the Earth which orbits the sun.

400. These stars are seen on every clear night of the year. Circumpolar stars.

500. These planets appear to undergo retrograde motion from Earth. All of them.

Solar System & Extrasolar Planets

100. These are three similarities found in Jovian planets.
Low density (less than water), large, massive, thick cloud layers (probably all gas), mostly hydrogen and helium, many moons, ring systems.

200. These are two techniques that have been successfully used to detect extrasolar planets.
Doppler shift (wobble method), transits, and gravitational lensing.

300. This is how the Greenhouse Effect works.
The Earth's atmosphere is transparent to visible light and opaque to IR light. The Earth heats up from the sun's visible light and re-radiates the heat in the IR which is then trapped by the atmosphere and heats up the Earth even more.

400. This is how the Moon formed.
A Mars-sized object slammed into the young Earth and knocked off a large amount of the young Earth's outer layers. The knocked off debris went into orbit around the Earth and eventually coalesced into the Moon.

500. This is why we can only detect the minimum mass of an extrasolar planet.
We can't tell what the orientation of the orbit is, i.e. we only detect a radial velocity along our line of sight. If the plane of the orbit is titled away from our line of sight at all, then the planet is actually more massive than what we detect.

Light & the Sun

100. This is what the sun will end its life as. White dwarf

200. Longer wavelengths correspond to this energy. Lower.

300. These are two types of electromagnetic radiation with frequencies smaller than visible and two with larger. Larger: UV, X rays, gamma rays. Smaller: IR, microwave, radio.

400. This is the large, extended, million degree layer of the sun. Corona.

500. This is one thing that we can learn about a star directly from its spectrum.
Redshift (recession velocity) and chemical composition.

Stars

100. This is the source of energy for main sequence stars. Hydrogen fusion.

200. This spectral type has the shortest lifetime. Type O stars.

300. This is what we call a rotating neutron star with a powerful jet that crosses our line of sight.
Pulsar.

400. An accreting white dwarf in a binary system that suddenly and repeatedly brightens is called this. Nova.

500. This is one way to infer the presence of a black hole.
High energy (X ray) emission from an extremely compact source or stars with short periods (i.e. they are moving very fast) orbiting an extremely compact source.

Galaxies

100. These are the two main types of galaxies. Spirals and ellipticals.

200. This is how the Milky Way looks in our night sky. A thin band of stars.

300. These are the three main parts of the Milky Way. Disk, halo, (central) bulge.

400. This is how fast distant galaxies are receding compared to nearby ones. Faster.

500. Astronomers believe that most large galaxies, including the Milky Way, have this at their center. A supermassive (million solar mass) black hole.

Cosmology

100. A blueshifted object is moving this direction relative to us. Towards.

200. These two elements were the main product of the Big Bang. Hydrogen and helium.

300. In 1998, it was announced that distant supernova studies showed that the Universe was doing this. Accelerating.

400. A class of objects that all have the same intrinsic luminosity is called this. Standard candle.

500. Olber's Paradox states this.
If the Universe is infinitely large and infinitely old, why is the night sky dark?

FINAL

The Big Bang

This solves the horizon and flatness problems of the Big Bang. Inflation.

Our Universe's geometry can be described as this. Flat (or Euclidean).