

AST 301
Quiz #10

Name: _____

1. a) If the cosmic background radiation was originally emitted by ionized gas at a temperature of 3000K, at what wavelength was it brightest when it was emitted? (Hint: the Sun has a surface temperature of 6000K and is brightest at a wavelength of 500 nm.)

Since the gas was at $\frac{1}{2}$ the temperature of the Sun, the radiation was emitted at twice the wavelength, or 1000 nm.

b) The radiation we see is now brightest at a wavelength 1000 times longer than it was when it was emitted. How do we explain this?

The Universe has expanded by a factor of 1000 since the radiation was emitted and the photon wavelengths expanded along with the Universe. Alternatively, it could be explained by the fact that the gas that emitted the radiation we see is moving away from us at high speed.

2. State two ways Jovian planets differ from terrestrial planets.

They are farther from the Sun.

They have cooler surfaces.

They are bigger.

They contain large quantities of ices and gasses.