Physics Review for Astronomical Topics

Learning Targets:

HS-ESS1-1 I can develop a model based on evidence to illustrate the life span of the Sun and the role of nuclear fusion in the Sun's core to release energy that eventually reaches the Earth in the form of radiation.

HS-ESS1-2 I can construct an explanation of the Big Bang theory based on astronomical evidence of light spectra, motion of distant galaxies, and composition of matter in the universe.

HS-ESS1-3 I can communicate scientific ideas about the way stars, over their life cycle, produce elements.

You should be able to:

-calculate the temperature of a star based on its most intense wavelength of light and vice-versa.
-calculate the energy of a photon based on its frequency or wavelength.
-calculate the energy of a photon emitted by an electron changing energy levels based on the difference in energy levels.
-discuss why an element has a unique spectra (different from other elements)
-convert from Joules to electron-Volts.
-convert from mass to energy via Einstein's famous equation.
-convert from atomic mass units to MeV.
-calculate the energy released in a nuclear reaction given the mass difference in the reactants and products.
-state and describe the three pieces of evidence given in support of the Big Bang theory.
-discuss why it's difficult for nuclear fusion reactions to occur (especially on Earth).
-discuss what happens to a star as it runs out of various nuclear fuels in its core.
-discuss how elements up to iron are synthesized in stars and how elements beyond iron are synthesized