

Things to know:

*This meant as a guide to what you should know. I make no guarantees that this material will be on the test, or that there won't be additional material on the test.*

How do you measure distances to stars?

What are constellations?

Coordinates: Right Ascension and Declination, Degree, Arcminutes and Arcseconds.

Definition of, parallax, light year and parsec

What are proper motions?

The cosmic calendar.

Your cosmic address

Age of the universe, of our galaxy, of the Sun

How distant is the nearest star, nearest galaxy, most distant galaxies?

Newton's three laws of Motion

Newton's law of Universal Gravitation

Conservation of energy and the different types of energy.

What is the wavelength and frequency of a light wave?

What is an atom, ion and molecule?

What is a photon and what is the energy of a photon?

Why do atoms emit and absorb light at only very discrete, precise frequencies?

What is a blackbody?

What is a spectrum, an emission line spectrum, absorption line spectrum and continuum spectrum? How do you get these spectra? What are Kirchoff's laws?

What is the difference between a reflecting and refracting telescope?

What is an interferometer?

What is angular resolution and how is it calculated?

What are two advantages of putting a telescope into space?

The structure of the Sun

How is energy produced in the Sun?

What is nuclear fusion?

Know the proton-proton chain, step by step!!!

How does core of the Sun act as a thermostat?

How does that energy get out of the Sun?

What is a photosphere?

What is the main sequence?

Know the HR diagram!!!!!!

Where are the red giants on the HR diagram? Super giants? White dwarfs?

What are spectral types?

What is the sequence of spectral types with decreasing temperature (OBAFGKM)?

What is a brown dwarf?

How do you determine the age of a cluster?

Where do stars form?

Why do molecular clouds collapse?

What are protostars and pre-main sequence stars, and where do they get their energy?

What are clusters of young stars?

What is the initial mass function

Infrared light – how it penetrates dark dusty clouds (in the case of infrared light with a wavelength of 2 micron or 2000 nm allowing us to see *stars* inside and behind the clouds) and how cold dust grains emit infrared light at a wavelength of 100 microns or 100,000 nm (but not at 2

microns since the clouds are too cold) allowing us to see *clouds* in the infrared.

What is a low mass, intermediate mass and high mass stars?

How does stellar evolution differ for low and high mass stars after stars run out of Hydrogen in their cores and leave the main sequence.

Different types of nuclear “burning” (i.e. nuclear fusion) such as proton-proton chain, CNO cycle, helium burning (you don’t need to know the steps of the CNO cycle but you do need to know what CNO stands for!).

What is shell burning and how does it lead to a broken thermostat?

Where did Hydrogen and Helium come from and where do the heavier elements come from?

What is a supernova?

What is a planetary nebula?