

Vocabulary: Unit 1: The Big Bang

Big Bang Theory	The theory that the universe originated 13.7 billion years ago from the cataclysmic explosion of a small volume of matter at extremely high density and temperature.
Doppler Effect	The change in frequency of a wave (or other periodic event) for an observer moving relative to its source.
Absorption lines	Dark lines at specific points in an absorption spectrum, signifying the chemical composition of the observed object.
Hubble's Law	The generalization that the speed of recession of distant galaxies (the red shift) is proportional to their distance from the observer.
Redshift	Shift of wavelengths of light toward the red end of the spectrum; happens as a light source moves away from us.
Spectrum	Colors of light that are visible in a continuum.
Nuclear fusion	A nuclear reaction that occurs in the core of a star in which atomic nuclei of low atomic number (i.e. hydrogen) fuse to form a heavier nucleus (i.e. helium) with the release of energy.
Plasma	A fourth state of matter made up of superheated gas with a positive electrical charge.
Radiative zone	The layer of a star that lies just outside the core, to which radiant energy is transferred from the core in the form of photons.
Convective zone	A region of turbulent plasma between a star's core and its visible photosphere at the surface, through which energy is transferred by convection.
Photosphere	The visible surface of the Sun; the region that emits sunlight.
Chromosphere	A thin zone outside of the photosphere that glows red as it is heated by energy from the photosphere.
Corona	The outermost plasma layer of a star.
Solar cycle	The periodic change in the sun's activity (including changes in the levels of solar radiation and ejection of solar material) and appearance (visible in changes in the number of sunspots, flares, and other visible manifestations); they have an average duration of about 11 years.
Sunspot	Areas on the Sun where loops of the magnetic field break through the surface and disrupt the smooth transfer of heat from lower layers, making them cooler, darker, and marked by intense magnetic activity.
Solar flare	Violent explosions caused by a loop of the Sun's magnetic field breaking that release huge amounts of energy.
Coronal mass ejection	A particularly intense, large solar flare.
Solar prominence	A glowing arch that reaches thousands of kilometers into the Sun's atmosphere, caused if plasma flows along a loop of the Sun's magnetic field from sunspot to sunspot.
Solar wind	The continuous flow of charged, irradiated particles from the sun that permeates the solar system.
Gravity	The force of attraction of bodies to each other with a force proportional to their mass and distance.
Universal Law of Gravitation	The law, theorized by Isaac Newton, stating that the force with which bodies are attracted to each other is directly proportional to the masses of the objects and inversely proportional to the square of the distance by which they are separated.
Main sequence	A major grouping of stars that forms a relatively narrow band from the upper left to the lower right when plotted according to luminosity and surface temperature on the Hertzsprung-Russell diagram.
Red giant	A very large star of high luminosity and low surface temperature.
Supernova	A star that suddenly increases greatly in brightness because of a catastrophic explosion that ejects most of its mass.
Nucleosynthesis	The process by which heavier chemical elements are synthesized from hydrogen nuclei in the interiors of stars.
Neutron star	A celestial object of very small radius (typically 18 miles/30 km) and very high density, composed predominantly of closely packed neutrons.
Black hole	A region of space with an extremely high gravitational field resulting from the collapse of a massive star.
White dwarf	A small very dense star that is typically the size of a planet; formed when a low-mass star has exhausted all its central nuclear fuel and lost its outer layers as a planetary nebula.

