Definitions and Concepts for CAIE Physics IGCSE

Topic 6: Space Physics

*Definitions in **bold** are for extended students only*

6.1 Earth and the Solar System

6.1.1 The Earth

Axis - An invisible line around which an object rotates, or spins.

Hemisphere - The two equal halves created when the Earth is split in horizontally– the northern hemisphere and the southern hemisphere.

Orbit - a repeating circular path around another body.

Orbital period - The time taken for an object to complete one orbit.

Periodic - A phenomenon is one that occurs at regular intervals.

Planet - A sphere of rock or gas orbiting a star with a gravitational field strong enough to pull in all nearby objects.

Waxing - This term describes when the illuminated proportion of the Moon's visible surface is increasing.

Waning - This term describes when the illuminated proportion of the Moon's visible surface is decreasing.

6.1.2 The Solar System

Accretion - the process of growth or increase by the gradual accumulation of matter.

Asteroid - A small rocky object in the asteroid belt between Mars and Jupiter, which orbits the sun.

Artificial Satellite - objects sent into a planet's orbit by mankind (such as the international space station).

Comet - An object made of dust and ice that orbits the Sun in a highly elliptical orbit, which often reaches beyond the solar system.

Elliptical - The oval-shaped path with which objects orbit the sun. Some objects, such as comets, have a more elliptical orbit than others.

Minor Planet - A mass that orbits the sun but does not have a gravitational field strong enough to pull in all nearby objects.

Natural Satellite - naturally occurring bodies that orbit a planet (such as a moon).

Solar System - The gravitationally bound systems of a star and the objects that orbit it. Solar systems orbit around their galaxies just as planets orbit around their suns.

The Sun - the star at the centre of our solar system.

6.2 Stars and the Universe

6.2.1 The Sun as a star

Electromagnetic spectrum - the range of wavelengths or frequencies over which electromagnetic radiation extends.

Infrared radiation - Radiation extending from the red, longer wavelengths of the visible-light range to the microwave range. It is invisible to the eye and felt as heat.

Nuclear fusion: The process of making a single heavy nucleus (part of an atom) from two lighter nuclei.

Star - A ball of gas, mostly hydrogen and helium, held together by gravity.

Ultraviolet radiation - Radiation of a wavelength which is shorter than visible light but longer than X-rays. It is invisible to the eye and turns skin darker.

Visible radiation - Radiation of wavelengths between ultraviolet and infrared, which is visible to the human eye.

6.2.2 Stars

Astronomical distance - The distance from one celestial body to another, measured in light-years (**9.5×10^{15} m.**).

Galaxy - A huge collection of stars (like our Sun), each with their own solar system. The sun is in a galaxy called the Milky Way.

Nebula - The massive cloud of dust and gas from which a star forms.

Protostar - when a cloud of gas and dust has begun to collapse under its own gravity but is not yet hot enough to shine.

Stable star - A star in equilibrium (the sun), meaning the force of gravity is balanced by the outward gas pressure from nuclear fusion.

6.2.3 The Universe

Big Bang Theory - The theory that the Universe formed about 13.8 billion years ago, from a very small, extremely hot, dense region which expanded outwards.

Cosmic microwave background radiation (CMBR) - Microwave radiation of a specific frequency, which is observed at all points in space around us. Its existence was predicted by the Big BangTtheory.

The Hubble Constant - a constant, which can be expressed as a ratio of the speed at which the galaxy is moving away from the Earth to its distance from the Earth.

Recede - To move further away.

Redshift - An increase in the observed wavelength of electromagnetic radiation emitted from an object which is moving further away.

Universe - Contains the galaxies and their solar systems.