

Vocabulary: Bohr Model of Hydrogen

Vocabulary

- Absorption spectrum – a spectrum that contains dark lines superimposed on a bright continuous spectrum; also called a *dark-line spectrum*.



Absorption spectrum

- An absorption spectrum is created when light passes through a group of atoms.
 - Some of the wavelengths of light are absorbed by electrons in the atoms, causing the electrons to move to higher *energy levels*.
 - These wavelengths appear as dark bands in the resulting absorption spectrum.
 - Light that is not absorbed by the atoms makes up the bright part of the spectrum.
- Bohr model – a model of the atom that depicts a small, positively charged nucleus surrounded by electrons moving in discrete circular orbits.
 - The radius of each electron orbit in the Bohr model is determined by the energy of the electron in that orbit. Only specific energies (and thus specific *orbital radii*) are allowed.
 - An electron may jump from one orbit to another but will not pass through the space between orbits. The jump is called a *quantum leap*.
 - Although the Bohr model has been replaced by the more accurate *valence shell* atomic model, it is useful for studying basic concepts in quantum physics.
- Electron volt – a unit of energy that is equal to the energy of an electron that is accelerated by a potential difference of 1 volt.
 - Electron volts are used to describe the energy an electron gains or loses as it moves from one orbital to another.
 - Electron volts also are used to describe the energies of *photons*.
- Emission spectrum – a spectrum of colored lines on a dark background; also called a *bright-line spectrum*.



Emission spectrum

- An emission spectrum is created when an element or elements emit light at certain wavelengths.
- In astronomy, emission spectra are usually associated with nebulae.

- Energy level – an allowed energy for an electron orbiting the nucleus.
 - Each energy level corresponds to a specific orbital or group of orbitals. These groups of orbitals are known as *electron shells*.
- Ionization energy – the minimum energy required to remove an electron from an atom.
- Laser – a device that emits a concentrated beam of light with a single wavelength and direction.
 - LASER is an acronym for *light amplification by stimulated emission of radiation*.
 - Unlike light from other sources, the beam of light from a laser does not spread out as it moves away from its source.
- Orbital – a region in space occupied by an electron or pair of electrons.
 - Formally, an orbital is a mathematical function that describes the probability of an electron (or pair of electrons) being found in a particular space.
- Photon – the smallest possible amount of light; a *quantum* of light.
 - A photon can behave as a discrete particle or as a wave.
 - Photons are distinguished by their wavelengths. The shorter the wavelength, the greater the energy a photon carries.

