

What is Electromagnetic Spectrum?

The **electromagnetic (EM) spectrum** is the range of all possible electromagnetic radiation. The "electromagnetic spectrum" (usually just *spectrum*) of an object is the characteristic distribution of electromagnetic radiation from that particular object.

The electromagnetic spectrum extends from below the frequencies used for modern radio (at the long-wavelength end) through gamma radiation (at the short-wavelength end), covering wavelengths from thousands of kilometers down to a fraction the size of an atom. It's thought that the short wavelength limit is the vicinity of the Planck length, and the long wavelength limit is the size of the universe itself (see physical cosmology), although in principle the spectrum is infinite and continuous.

Spectroscopy can detect a much wider region of the EM spectrum than the visible range of 400 nm to 700 nm. A common laboratory spectroscope can detect wavelengths from 2 nm to 2500 nm. Detailed information about the physical properties of objects, gases, or even stars can be obtained from this type of device. It is widely used in astrophysics. For example, many hydrogen atoms emit radio waves which have a wavelength of 21.12 cm.

