

Fiber Optics

When the frequency of a signal is increased, so does the transfer rate. On the electromagnetic spectrum, light waves occupy frequency ranges of several hundred Terahertz. Fiber optics and photonics take advantage of the speed of light waves to allow for a different approach to data communications. When using light waves instead of electrical charges, this drastically alters the normal characteristics of electrical information transfer. A light wave being sent through glass in a fiber optic wire is no longer restricted to Ohm's law for example, since a light wave will move through a resistor without any loss. Although light waves are susceptible to quantum noise, they are immune to noise caused by heat (in many cases, this means they are virtually noise-less). Fiber optics, due to their high data rates, flexibility and immunity to noise offer an extraordinary opportunity for scientific and engineering progress.

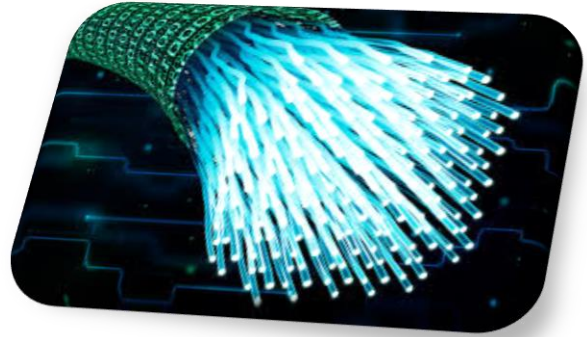


Figure 1. Fiber optic wires wrapped together in a cord

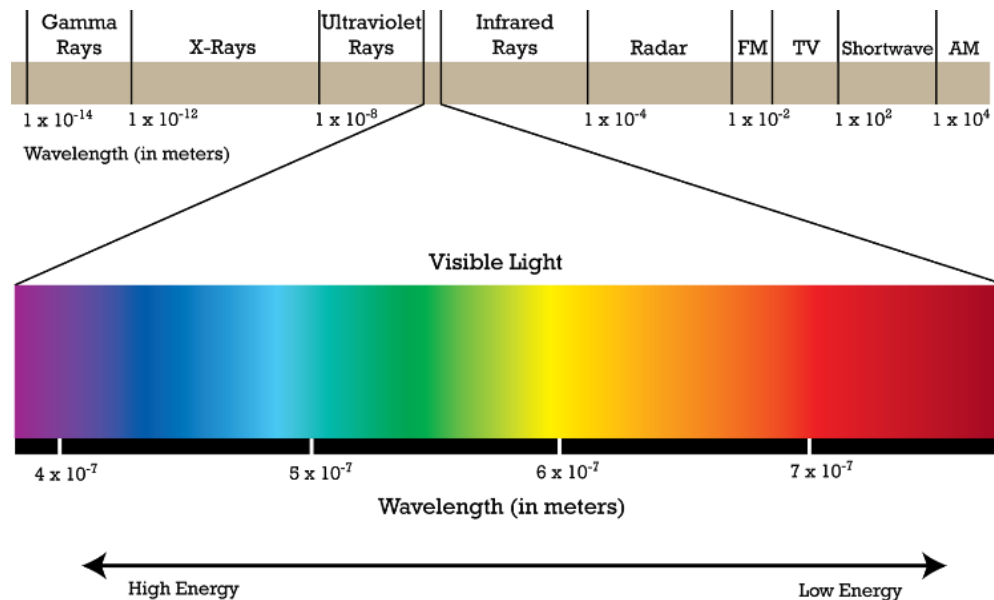


Figure 2. Electromagnetic Spectrum Frequencies Featuring Light Waves