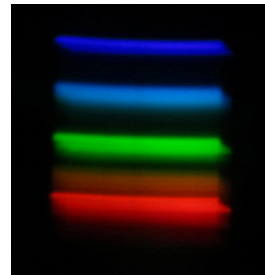


Using your spectroscope

Try looking at different light sources to see what colours of the spectrum they give out or **emit**.



If you look at a TV screen or a fluorescent light you will see **separate lines** of different colours

Sunlight

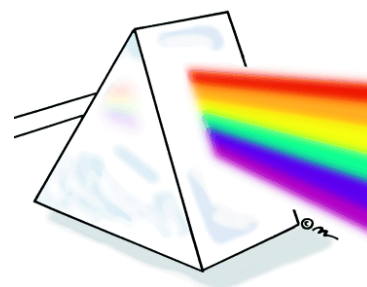
The diagram illustrates the Electromagnetic Spectrum with two scales: energy and wavelength. At the top, a horizontal arrow points from right to left, labeled "High energy" on the left and "Low energy" on the right. Below this, a horizontal bar is divided into seven colored sections representing different types of electromagnetic radiation, ordered from highest energy on the left to lowest energy on the right: Gamma Rays (black), X-Rays (blue), Ultra-violet (purple), Visible light (a rainbow spectrum), Infra-red (red), Micro waves (grey), and Radio waves (black). Below the spectrum bar, a sine wave represents the wavelength of the radiation. The wave starts with many closely spaced peaks on the left, labeled "Short wavelength", and gradually becomes flatter with fewer, more widely spaced peaks towards the right, labeled "Long wavelength".

The most useful part of the spectrum for Solar scientists is **visible light** (the light we can see) as it has enough energy and all of it reaches the Earth's surface.

Solar cells and panels are good at turning **visible light energy** into **electricity** so we want to capture as much of it as possible.

Visible Light

Visible light can be split up into all the colours of the rainbow. When you see a rainbow in the sky, the visible light from the sun is split up by the raindrops in the air. We can also use **prisms** or things called **diffraction gratings** to split the light up too.



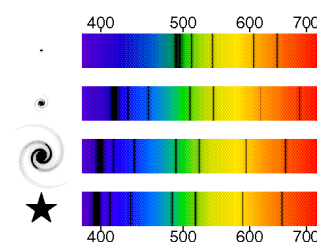
In solar cells, we use **coloured materials** like dyes and polymers to absorb the different colours of the rainbow in order to make electricity from the sun.

Spectroscopy in Science

The way that the Electromagnetic Spectrum interacts with matter is called Spectroscopy. We use special spectrometers in science to find out lots of things about everything around us

Astronomy

Astrophysicists use spectroscopy to find out what stars are made of and how galaxies move by studying the light they emit into space.



¹Image from <http://cosmology.com/BigBang4.html>

Chemistry

New chemical compounds are identified using spectroscopy to find out what elements they are made of.

Solar scientists use spectroscopy to investigate new dyes and materials for solar cel

NMR Spectroscopy of ethanol (alcohol)

