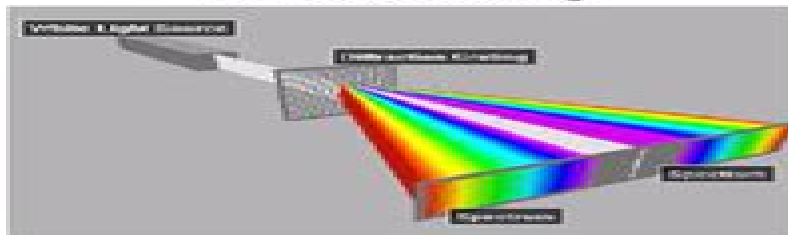


# Diffraction gratings and their applications

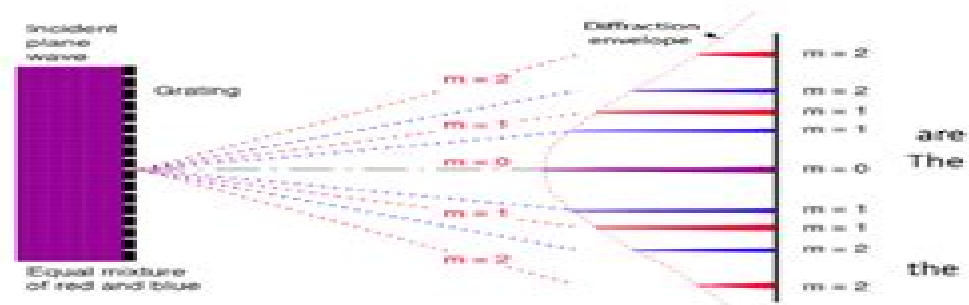
## Introduction to Gratings

A diffraction grating is a flat object which has a series of lines which block parts of an advancing wave-front. An example is that in microwaves you could use regularly spaced metal bars or wires to represent these lines. The space between the grating lines is something that should be considered with closely as if it is close to the size of the wavelength of the incident radiation the grating would therefore produce an **interference pattern** of regularly spaced bright and dark lines. In diffraction you get **transmission** which is when a wave front meets a diffraction grating and some of those waves propagate through the gaps between the grating lines. In the grating some of the energy is absorbed in itself however the remainder energy is then pushed backwards which is known as **reflection**. Another example is with light. When it comes to light you would usually use a piece of glass with a series of very fine scratches evenly spaced. Below is an example of diffraction.

Diffraction Grating



This figure shows the clear separation of the wavelengths of light. There are multiple orders of peaks. The intensities of the peaks are affected by the diffraction envelope which is determined by the width of the gaps in the grating.



# Diffraction Gratings And Applications

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**Ginés Lifante**



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