

The Doppler Effect

The apparent frequency of a wave is affected by the motion of the source of the wave or the observer. If the source and observer are approaching the wave seems to have a higher frequency and shorter wavelength. If the source and observer are receding the wave seems to have a lower frequency and longer wavelength.

Wien's Law

As the temperature of a blackbody* increases the dominant frequency of its radiation increases also.

Kirchhoff's Laws

Law 1: A hot opaque body, such as a hot , dense gas or a warm solid, produces a continuous spectrum- a complete rainbow of colors without any spectral lines.

Law 2: A hot thin gas produces an emission (bright line) spectrum- a series of bright spectral lines against a dark or dim background.

Law 3: A cool transparent gas in front of a source of a continuous spectrum produces an absorption (dark line) spectrum- a series of dark spectral lines among the colors of the continuous spectrum. These dark lines correspond to the locations of the the emission lines the cool gas would produce under the conditions of the second law (see above).

*A blackbody is an ideal object that absorbs all frequencies of light completely. Real blackbodies do not exist. But the law basically holds true for all objects.