

Academic Showcase: Spectroscopy Demonstration

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Abstract

Energy, light, and mass are all believed to be fundamental constituents of the entire known universe. Comprehension of reality, earth, and all the components thereof is the goal of science. The study of how matter and electromagnetic energy interact, known as spectroscopy, has resulted in discoveries of numerous phenomena. It's been shown that light is a disturbance in the electromagnetic field, and the electromagnetic (EM) field permeates the entire universe. However, this explanation of light as a wave does not fully represent reality. It is equally true that light behaves as a discrete packet or "particle". Light emission, as measured during this demonstration, is commonly used in NASA's analysis of space's celestial objects. Spectroscopy influences science and aids in our understanding of the universe entirely because it is composed of compelling connections between light, emissions, absorption, and matter. In this demonstration, electromagnetic radiation (light) travels through a prism within the spectroscope to display certain colors to the human eye, allowing us to identify the elemental composition of the light source. This is known as a substance's "atomic/molecular spectra". This experiment aims to demonstrate how this understanding of spectra can allow for determining the atomic and molecular composition of substances.