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Electromagnetic radiation is energy that travels as particles or waves, spreading out as it goes. The majority of the electromagnetic radiation that affects the Earth comes from the Sun. We can understand this radiation by looking at its range of wavelengths and frequencies, from the longer wavelength, low-frequency radio waves, to shorter wavelength, high-frequency gamma waves. Together, all of these different energy types, most of them invisible, are called the electromagnetic (EM) spectrum, or spectrum for short.

Energy from the Sun reaches Earth as solar radiation, which composes just one part of the full electromagnetic spectrum. Solar radiation includes the visible light we seeand many other "colors," or wavelengths, of energy that are beyond the range of human vision.

Visible light represents about 47% of the energy Earth receives from the Sun. Over half of the Sun"s energy reaches Earth as infrared energy, which is invisible but which we can sometimes experience similarly to heat. Ultraviolet (UV) radiation, which is also invisible, makes up about 2% of the solar spectrum.

The visible light region of the electromagnetic spectrum is made up of different-sized wavelengths of light. Each wavelength defines a unique color. All wavelengths of visible light together make up white light.

Blue isn"t the dominant wavelength in the visible part of the spectrum, but our sky appears blue on a clear day because Earth"s atmosphere scatters shorter, blue light wavelengths most effectively.

Infrared radiation has wavelengths from 780 nm to 1,000,000 nm (or 1 mm), longer than those of visible light. We sometimes think of infrared radiation from the Sun as heat, but infrared radiation is not quite the same thing as heat. In fact, infrared radiation may not always feel warm. Even objects we consider being very cold, such as an ice cube, give off infrared energy.

Energy types on the electromagnetic spectrum are denoted by wavelength. Infrared wavelengths are longer than those of visible light, while ultraviolet wavelengths are shorter.

There are also other types of radiation that come from the Sun, such as X-rays, gamma rays, and radio waves, that are invisible to the human eye. Only small amounts of these more unusual types of radiation reach Earth due to the protective shielding of Earth"s magnetosphere.

Radio waves, shown on the left side of the spectrum, have the lowest energies, longest wavelengths, and lowest frequencies of any type of radiation. Microwaves (like the ones used in microwave ovens) are shown just to the right of radio waves on the EM spectrum and have a little bit higher energy. Gamma rays, shown on the far right side, have the highest energies, the shortest wavelengths, and the highest frequencies. These higher-frequency radiation types are among the most dangerous to humans and can cause damage by

penetrating the skin and harming cells.

For more than three decades, Hubble has studied the Universe using its 2.4-metre primary mirror and its five science instruments. They observe primarily in the ultraviolet and visible parts of the spectrum, but also have some near-infrared capabilities. Hubble observes in different wavelength bands, one band at a time, each providing different information on the object under study. Each of these wavelengths is reproduced in a different colour and these are combined to form a composite image that well resembles the true emission from that celestial object.

By exploring this image, you can see how astronomers have used a set of single-colour images to construct the colour picture of a ring of star clusters surrounding the core of the galaxy NGC 1512. Each image represents a specific colour or wavelength region of the spectrum, from ultraviolet to near infrared, and shows the wide wavelength range covered by Hubble. Astronomers chose to study NGC 1512 in these colours to emphasise important details in the ring of young star clusters surrounding the core.

To celebrate the telescope"s 25th anniversary in 2015, Hubble unveiled two new beautiful portraits of the popular Pillars of Creation, revealing how different details can be studied in visible and near-infrared observations. While the visible light captures the multi-coloured glow of gas clouds, the infrared image penetrates much of the obscuring dust and gas to uncover countless newborn stars.