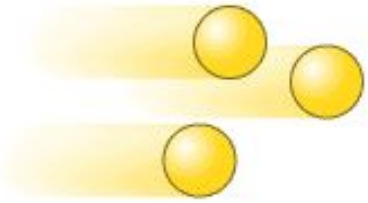
CATCHING LIGHT

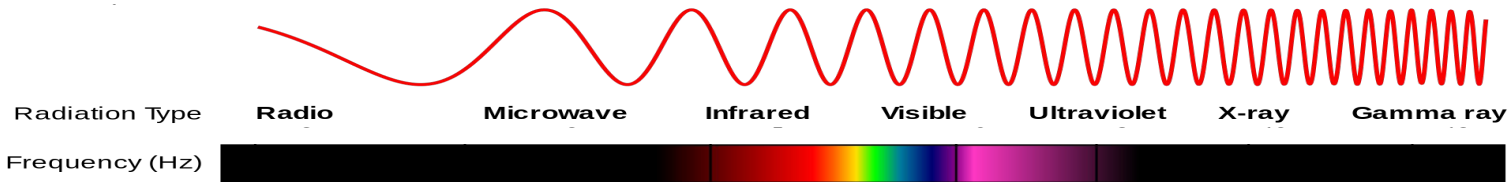
Waves

Light travels as both a **particle** and a **wave**. We call light particles **photons.**



or particles?

Photons have **energy.** The longer the wavelength, the less energy the photon has.

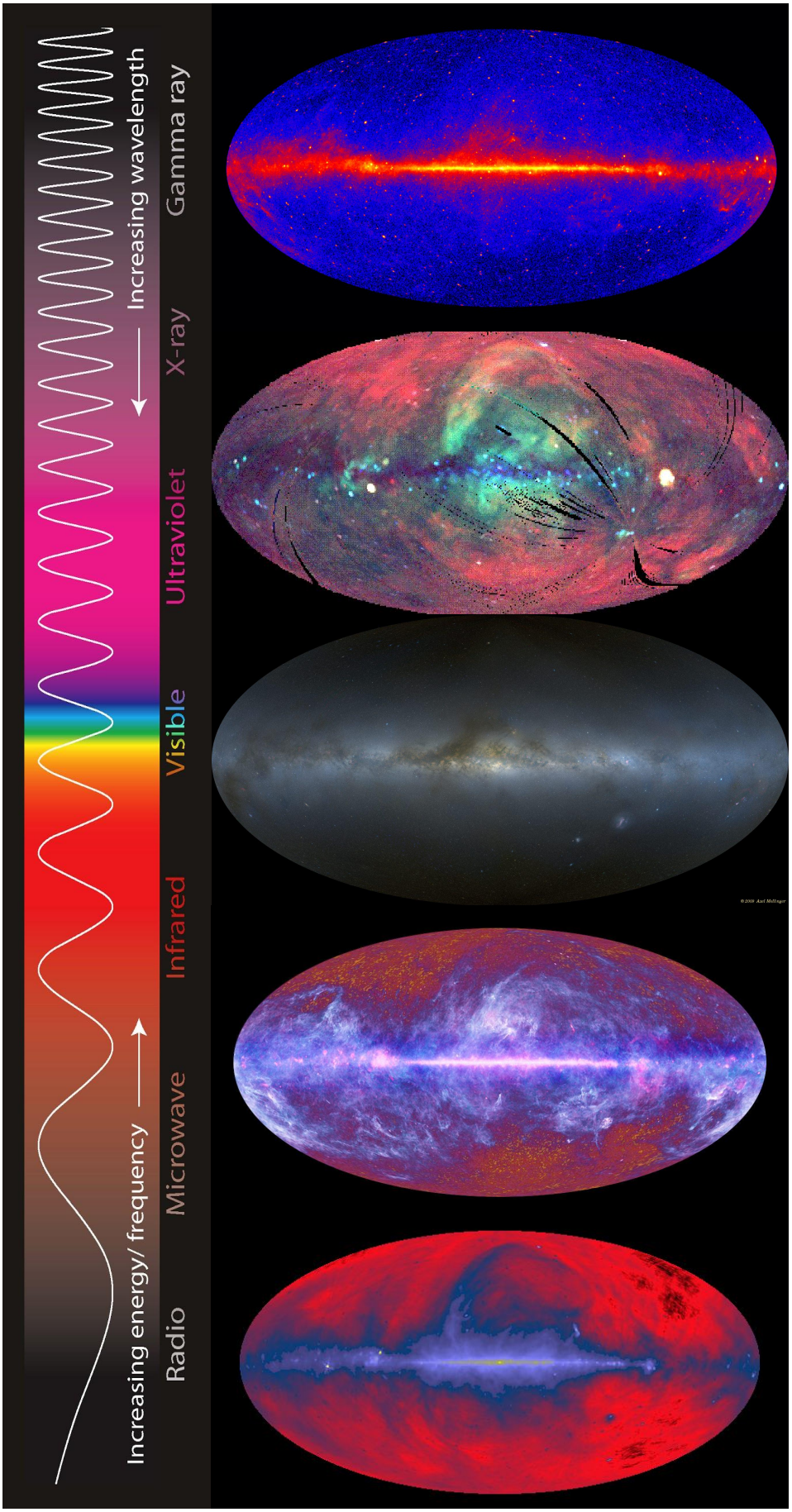


Less Energy

More Energy

Different kinds of light teach us different things about the universe. The same object viewed with varying wavelengths of light can look very different. Astronomers design **telescopes** to catch a particular kind of light with particular energy.

If you flip this paper over, there are images of the Milky Way taken by observing different kinds of light. Although there are some similarities between the pictures, they all give us different information about our galaxy.



Gamma Ray (Fermi)

This is an image of the most energetic photons. These gamma rays are most likely due to the collision of cosmic rays with interstellar clouds, producing photons spread out across the galactic plane.

X-Ray (Rosat)

The x-rays in this image are emitted by hot gas. We can see plumes of gas rising above the galactic plane. These are the remains of old supernova.

Visible (A, Mellinger)

In this optical image, we see light from the stars in the Milky Way. The dark patches are clouds of dust obscuring our view.

Microwave (Planck)

In addition to showing gas and dust in our galaxy, this image also shows us the the Milky Way's magnetic field lines. The blue traces charged particles moving in the galaxy's magnetic field.

Radio (MPIfR)

The radio emission traces both hot ionized hydrogen gas in between stars as well as electrons in strong magnetic fields.

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