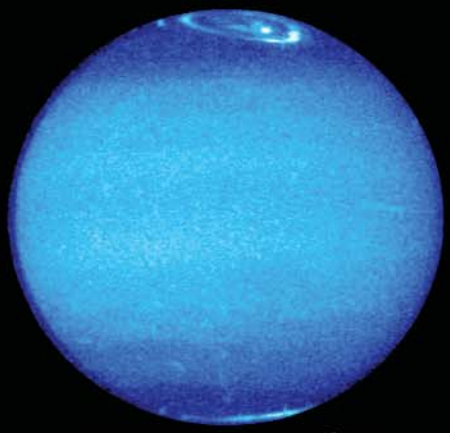
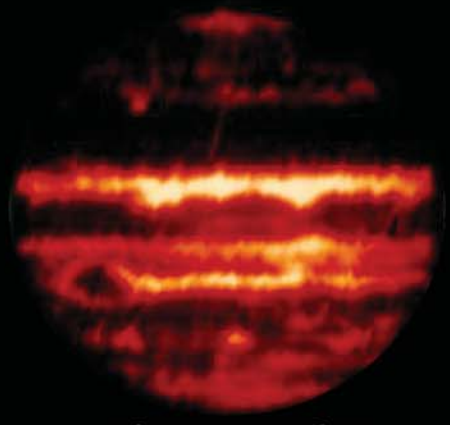
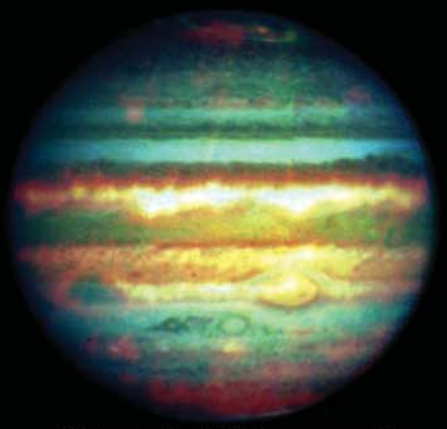
Visible Light Only



Ultraviolet Light Only

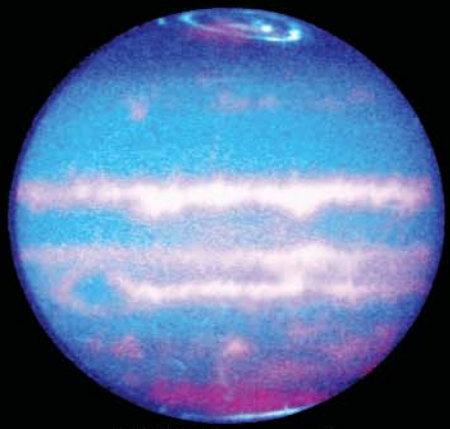


Infrared Light Only

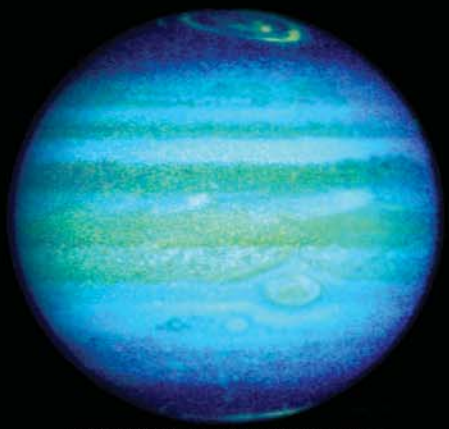


Visible/IR/UV Composite

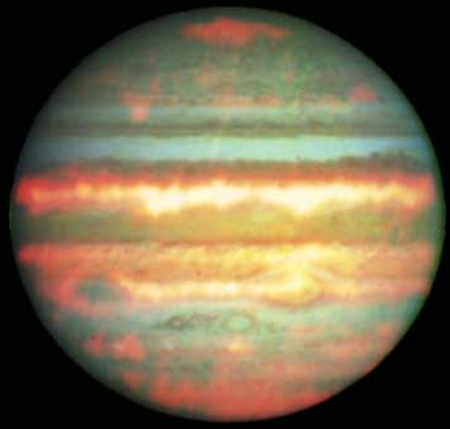
Visible/UV Composite



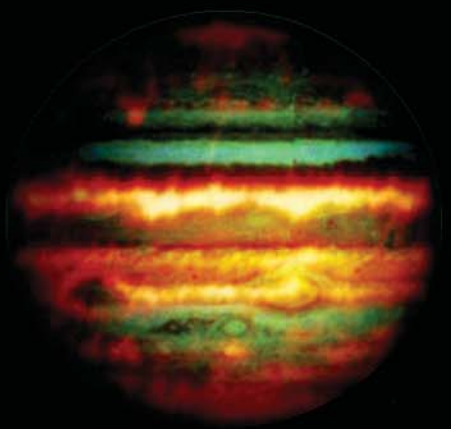
UV/IR Composite



UV/Visible Composite



Visible/IR Composite



IR/Visible Composite

What is a false-color composite?

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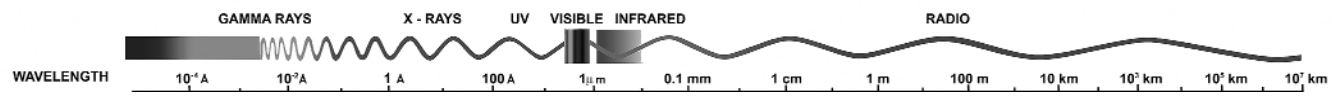
What Is a False-Color Composite?

When most of us think of light, we naturally think about the light we can see with our eyes. But did you know that visible light is only a tiny fraction of the *electromagnetic spectrum*?



You see, the human eye is only sensitive to certain *wavelengths* of light, and there are many other wavelengths, including radio waves, infrared light, ultraviolet light, x-rays, and gamma rays.

When astronomers observe the cosmos, some objects are better observed at wavelengths that we cannot see. In order to help us visualize what we're looking at, sometimes scientists and artists will create a *false-color* image. Basically, the wavelengths of light that our eyes can't see are represented by a color (or a shade of grey) that we can see. Even though these false-color images do not show us what the object we're observing would actually look like, it can still provide us with a great deal of insight about the object.

A *composite* is an image which combines different wavelengths into the same image. Since a composite isn't what an object really looks like, the same object can be represented countless different ways to emphasize different features. On the reverse are nine images of the planet Jupiter. The first image is a visible-light image, and shows the planet as it might look to our eyes. This image is followed by two false-color images, one showing the planet in the ultraviolet spectrum, and one showing it in the infrared spectrum. The six composites that follow are all made from the first three images, and you can see how different the planet can look!

Definitions

composite – An image that combines several different *wavelengths* of light that humans cannot see into one picture.

electromagnetic spectrum – Radio waves, infrared light, visible light, ultraviolet light, x-rays, and gamma rays. All these are actually types of light.

energy – See *wavelength*.

false-color – Any representation that does not show the true colors of the subject as they would appear to the eye. Usually false-color images are used to represent colors that the human eye cannot see.

wavelength – Literally, the distance between one peak of a wave and another. Since light travels in waves, wavelength is how we define its place in the *electromagnetic spectrum*. Radio waves can have incredibly long wavelengths, even longer than the size of the Earth. Gamma rays can have wavelengths smaller than an atom. Since the speed of light is always the same, we sometimes refer to wavelength as the *energy* of the light.

Image Credits: *Visible Light Image:* NASA / STScI. *Ultraviolet:* STScI, John T. Clarke and Gilda E. Ballester (University of Michigan), and John Trauger and Robin Evans (JPL). *Infrared:* Richard J. Terrile (JPL/Palomar Observatory). *Composites:* Jim Keller/SSC/IPAC/NASA. Electromagnetic Spectrum: Charles Bluehawk/IPAC/NASA.

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