Jupiter as you've never seen before

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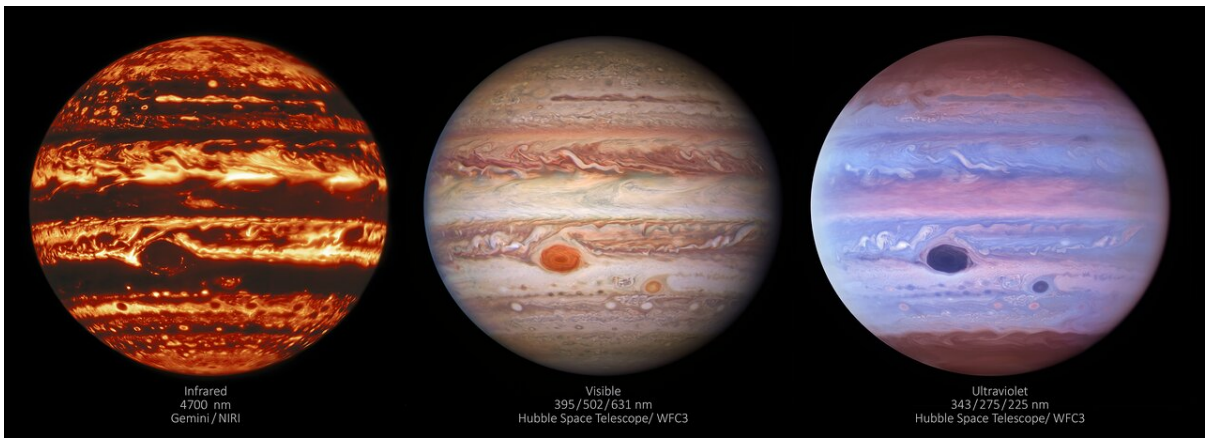

Jupiter is a gas giant with a quite agitated atmosphere: it has bands of clouds that spin in opposite directions and countless, almost never-ending storms sprinkled all over its surface. One of the biggest of these storm systems, the famous Great Red Spot, is so large it could swallow the entire Earth!

Astronomers love looking at planets and stars using different instruments and different types of light, as each of them can reveal something different. The details you can see with X-Ray telescopes are not visible with infrared, and vice-versa. Radio telescopes capture details from the Universe that we cannot detect using instruments working with the visible light our eyes can see.

A team of scientists using the Gemini North telescope and the NASA/ESA Hubble Space Telescope just took a few pictures of Jupiter in infrared, visible, and ultraviolet light.

These are different kinds of light distributed in what is called the "electromagnetic spectrum" in science. Heat, for example, is on the infrared part of the spectrum. We cannot see it with our eyes, but snakes can! Ultraviolet light, which causes sunburn, is also invisible to us, but bees can see it. There are many types of light that our eyes alone cannot see, so we need special instruments, like telescopes, to observe them.

Jupiter's dark region at the Great Red Spot is larger in infrared than in the image using visible light, for example. This is because different wavelengths of light reveal different structures.

While the infrared shows thick clouds in the region, visible and ultraviolet observations show the locations of chromophores — particles that give the Great Red Spot its specific colour by absorbing blue and ultraviolet light.

Jupiter also has a bright streak at its northern part, or hemisphere. Scientists believe it can be a powerful cyclone or a series of cyclones going from east to west, covering the huge area of 72,000 kilometers (nearly 45,000 miles) — that is one-fifth of the distance from the Earth to the Moon!

At visible light, the cyclone looks dark brown (these features are called "brown barges" because of this) — but at ultraviolet, it is barely visible. With infrared, it is possible to see four "hot spots" just below the brown barge. Astronomers are using data to study clouds in areas where NASA's Juno spacecraft detected radio signals coming from lightning activity. Isn't that amazing?

The image shows Jupiter in three different types of light: infrared, visible and ultraviolet

Image credit: International Gemini Observatory/NOIRLab/NSF/AURA/NASA/ESA, M.H. Wong and I. de Pater (UC Berkeley) et al.

COOL FACT

Jupiter is truly huge: it is twice as massive as all other planets combined. Despite its size, the planet has the shortest day of any other — it only takes about 10 hours for a complete rotation!

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