

Juno completes its closest flyby of Io yet

October 20 2023, by Evan Gough



Not since the Galileo mission ended 20 years ago have we seen such great images of Io. NASA's Juno spacecraft captured this image with its JunoCam instrument on October 15th from less than 12,000 km altitude. Ted Stryk processed the image. Credit: Ted Stryk/NASA/JPL-Caltech/SwRI/MSSS/

Jupiter's ocean moons capture most of our attention because of their potential habitability. But Io, Jupiter's bad-boy volcanic moon, is in a class of its own. There's nothing else like it in the solar system, and


NASA's Juno spacecraft captured new images of the volcanic satellite during its closest approach yet.

Io is Jupiter's third-largest [moon](#) and the solar system's fourth largest moon. It's also larger than our moon. It has the highest density and the strongest gravity of any moon. Io also has the least amount of water of any astronomical object in the solar system.

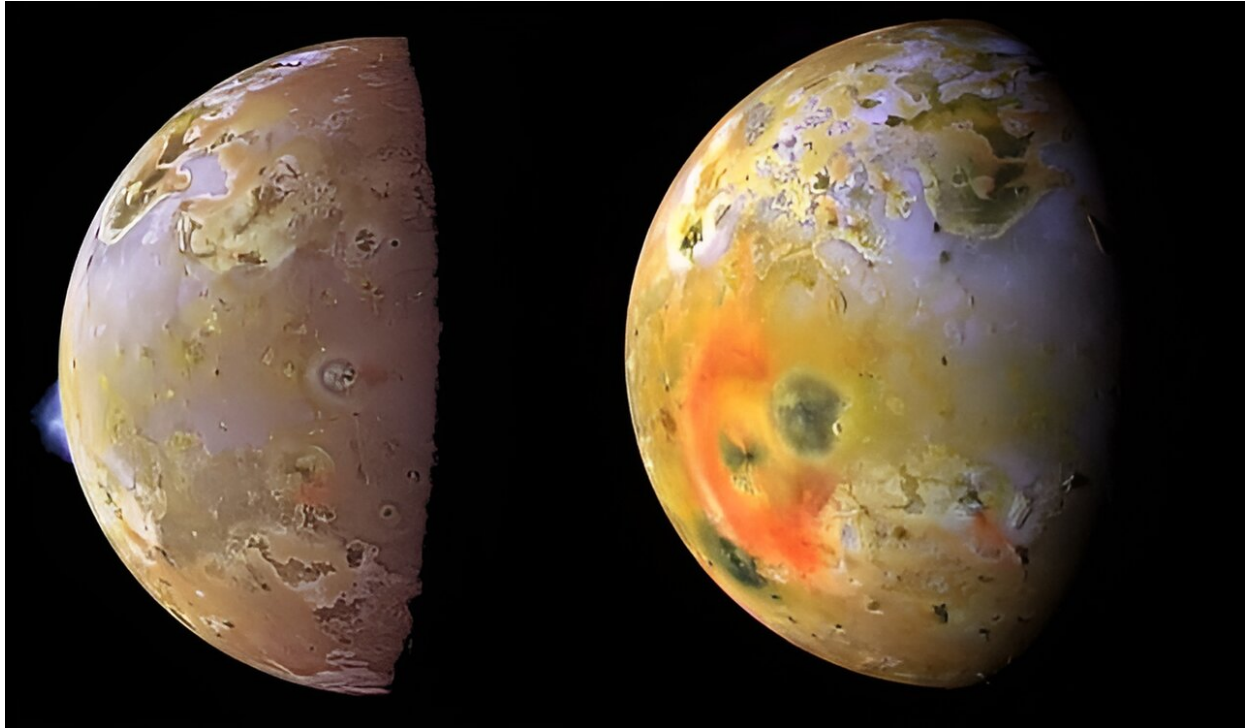
Those characteristics alone make it interesting. But what really garners Io so much attention, and led Juno to study it more closely, is its volcanic activity. It's the most geologically-active body in the solar system and boasts over 400 volcanoes, along with widespread lava flows.

Juno's JunoCam instrument captured new images of Io from its [closest approach](#) yet on October 15th, from less than 12,000 km away. Now, citizen scientists have processed these images and shared them with the rest of us. The result is the best images of Io we've seen since the Galileo mission ended 20 years ago.

We have NASA's foresight to thank for these images. When they were planning the Juno mission, they found room for JunoCam. JunoCam is primarily a public engagement instrument, though it does help provide context for the spacecraft's more rigorous science instruments. The camera was intended to capture images for [citizen scientists](#) and other skilled—or amateur—image processors to have fun with.

<i>Ganymede</i>		Jupiter	III (3)	2,634.1 ± 0.3
<i>Titan</i>		Saturn	VI (6)	2,574.73 ± 0.09
<i>Callisto</i>		Jupiter	IV (4)	2,410.3 ± 1.5
<i>Io</i>		Jupiter	I (1)	1,821.6 ± 0.5
<i>Moon</i>		Earth	I (1)	1,738

Io is the fourth largest moon in the solar system, but its volcanic activity is what sets it apart. Credit: Wikipedia



These Galileo images show two different episodes of volcanic eruptions and their plumes. The image on the left shows two plumes, one in blue on the moon's limb, and a more difficult to see one in the center near the terminator line. The image on the right shows another eruption from Pillan Patera in 1997 as the expanding red circle with the dark spot in the center. Credit: (L) NASA's Galileo spacecraft, public domain. (R) NASA/JPL

It's working as intended.

Io's widespread [volcanic activity](#) have shaped and reshaped its surface. The surface is restless, inhospitable, even tortured. The lava flows and volcanoes make it appear like a throwback to the [solar system](#)'s early days, when Earth and possibly the moon and other bodies were magma oceans. And with its sulfur-covered plains, comparisons with Hell are unavoidable.

Spacecraft have captured several of Io's eruptions over the years, and their scale is truly awesome. Some of them reach 400 km (250 miles) high.

Juno's not finished with Io yet. It's getting progressively closer to the volcanic moon. During Perijoves 57 and 58, on December 3rd and February 24th respectively, it'll perform two more Io flybys, each one closer than the last.

February 24th's flyby should be spectacular. It'll come to within 1500 km (930 miles) of the moon, giving us our most detailed images yet. Though Juno's main job is to study Jupiter, this [close approach](#) to Io should be one of the mission's highlights.

You could circle the date on your calendar, but that's probably not necessary. It'll be difficult to go on the web without seeing the images.

Provided by Universe Today

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