Jupiter's red spot thickness remains steady as surface area decreases

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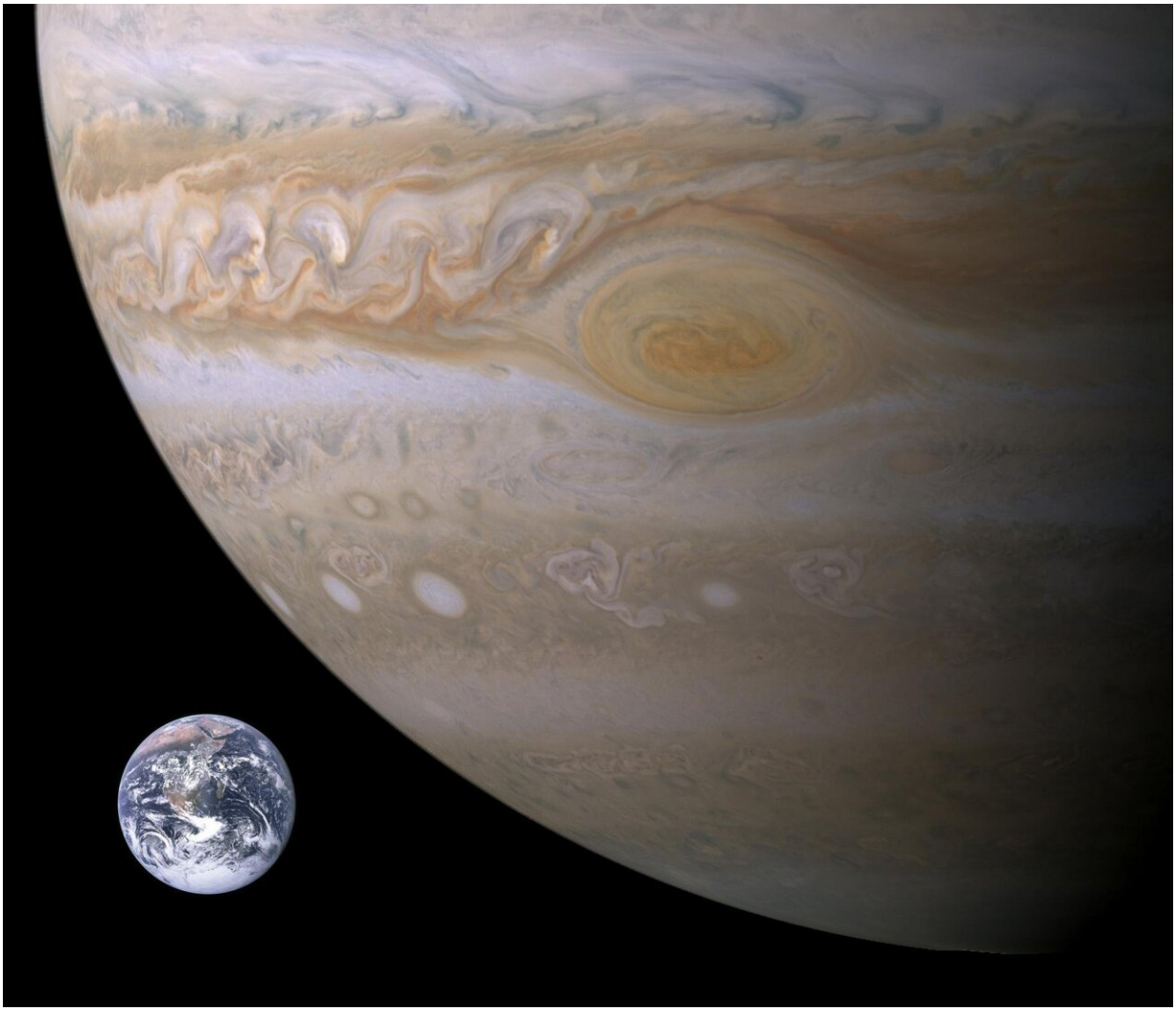

Jupiter’s Great Red Spot. Credit: NASA

A team of researchers affiliated with Aix-Marseille Université has found evidence that suggests the thickness of Jupiter's red spot has remained relatively stable as its surface area has decreased. In their paper published in the journal *Nature Physics*, the group describes how they estimated the thickness of the spot and why they believe it is not going to disappear anytime soon.

Jupiter's first three moons were discovered in 1610 by Galileo Galilei. Its Great Red Spot was first observed approximately 200 years later by Samuel Heinrich Schwabe. Since that time, the spot has remained an object of curiosity and scrutiny by both professional and amateur astronomers alike. In recent years, it has become clear that the spot is shrinking. Where once it was approximately three times as wide as Earth, it is now just twice as wide. Because of that, some in the space science community have begun to wonder if the storm that creates the spot is winding down and whether it will someday disappear completely. In this new effort, the researchers sought to better understand the thickness of the spot, which could provide clues about the strength of the storm, and ultimately, whether the spot is likely to disappear.

Back in 1979, the two Voyager space probes passed by the giant planet, giving researchers the opportunity to measure the red spot. The researchers with this new project wondered if its thickness had changed since back then. But because of the opaque atmosphere, it is impossible to measure the thickness of the spot directly. That forced them to use indirect means, such as creating math models and numerical simulations —they even built a stand-in for the red spot—a vortex in a plexiglass tank filled with saltwater. By comparing and combing their results from their work efforts, they were able to come to a consensus—the spot is approximately 170 kilometers thick. They noted that their results matched very closely with measurements taken by the Voyager probes, suggesting that the thickness of the spot has remained relatively steady. They next plan to compare their results with data from NASA's Juno

space probe, which orbits the planet every 53 days.

More information: Daphné Lemasquerier et al. Remote determination of the shape of Jupiter's vortices from laboratory experiments, *Nature Physics* (2020). DOI: 10.1038/s41567-020-0833-9