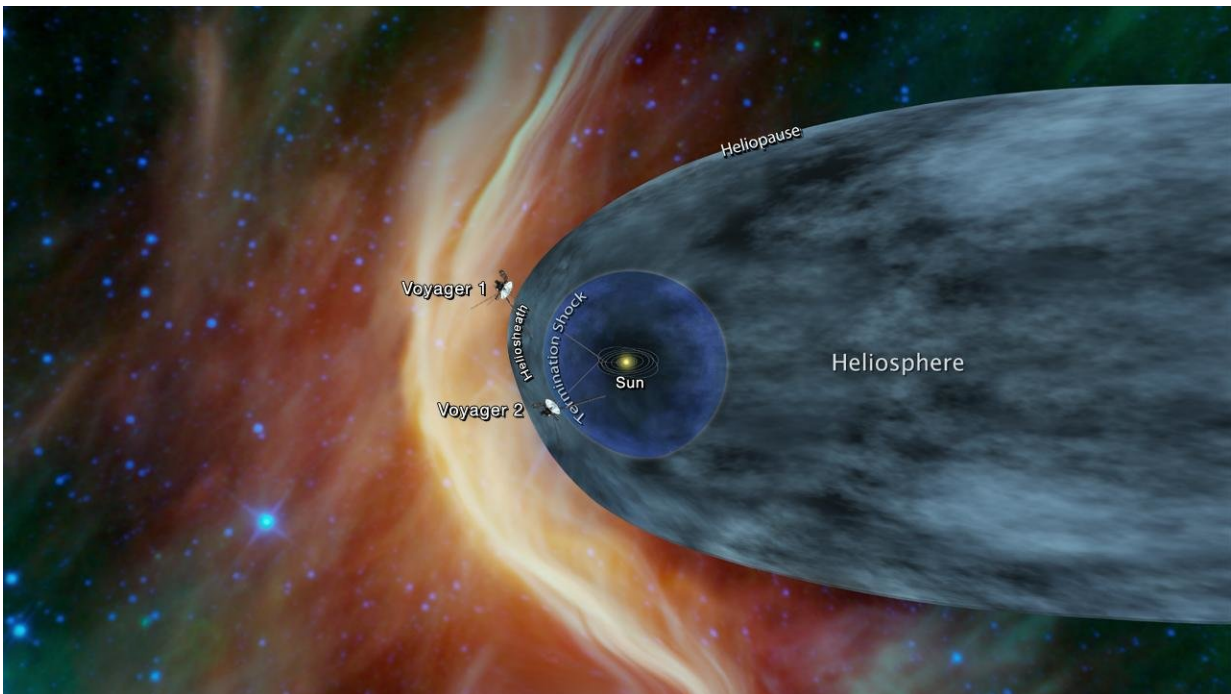


# NASA Voyager 2 could be nearing interstellar space

October 5 2018, by Karen Fox



This graphic shows the position of the Voyager 1 and Voyager 2 probes relative to the heliosphere, a protective bubble created by the Sun that extends well past the orbit of Pluto. Voyager 1 crossed the heliopause, or the edge of the heliosphere, in 2012. Voyager 2 is still in the heliosheath, or the outermost part of the heliosphere. Credit: NASA/JPL-Caltech

NASA's Voyager 2 probe, currently on a journey toward interstellar space, has detected an increase in cosmic rays that originate outside our

solar system. Launched in 1977, Voyager 2 is a little less than 11 billion miles (about 17.7 billion kilometers) from Earth, or more than 118 times the distance from Earth to the Sun.

Since 2007 the probe has been traveling through the outermost layer of the heliosphere—the vast bubble around the Sun and the planets dominated by solar material and magnetic fields. Voyager scientists have been watching for the spacecraft to reach the outer boundary of the heliosphere, known as the heliopause. Once Voyager 2 exits the heliosphere, it will become the second human-made object, after Voyager 1, to enter interstellar space.

Since late August, the Cosmic Ray Subsystem instrument on Voyager 2 has measured about a 5 percent increase in the rate of cosmic rays hitting the spacecraft compared to early August. The probe's Low-Energy Charged Particle instrument has detected a similar increase in higher-energy cosmic rays.

Cosmic rays are fast-moving particles that originate outside the solar system. Some of these cosmic rays are blocked by the heliosphere, so mission planners expect that Voyager 2 will measure an increase in the rate of cosmic rays as it approaches and crosses the boundary of the heliosphere.

In May 2012, Voyager 1 experienced an increase in the rate of cosmic rays similar to what Voyager 2 is now detecting. That was about three months before Voyager 1 crossed the heliopause and entered [interstellar space](#).

However, Voyager team members note that the increase in [cosmic rays](#) is not a definitive sign that the probe is about to cross the heliopause. Voyager 2 is in a different location in the heliosheath—the outer region of the [heliosphere](#)—than Voyager 1 had been, and possible differences

in these locations means Voyager 2 may experience a different exit timeline than Voyager 1.

The fact that Voyager 2 may be approaching the heliopause six years after Voyager 1 is also relevant, because the heliopause moves inward and outward during the Sun's 11-year activity cycle. Solar activity refers to emissions from the Sun, including solar flares and eruptions of material called [coronal mass ejections](#). During the 11-year solar cycle, the Sun reaches both a maximum and a minimum level of activity.

"We're seeing a change in the environment around Voyager 2, there's no doubt about that," said Voyager Project Scientist Ed Stone, based at Caltech in Pasadena. "We're going to learn a lot in the coming months, but we still don't know when we'll reach the heliopause. We're not there yet—that's one thing I can say with confidence."

Provided by Jet Propulsion Laboratory

Citation: NASA Voyager 2 could be nearing interstellar space (2018, October 5) retrieved 21 March 2023 from <https://phys.org/news/2018-10-nasa-voyager-nearing-interstellar-space.html>

<p>This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.</p>
--