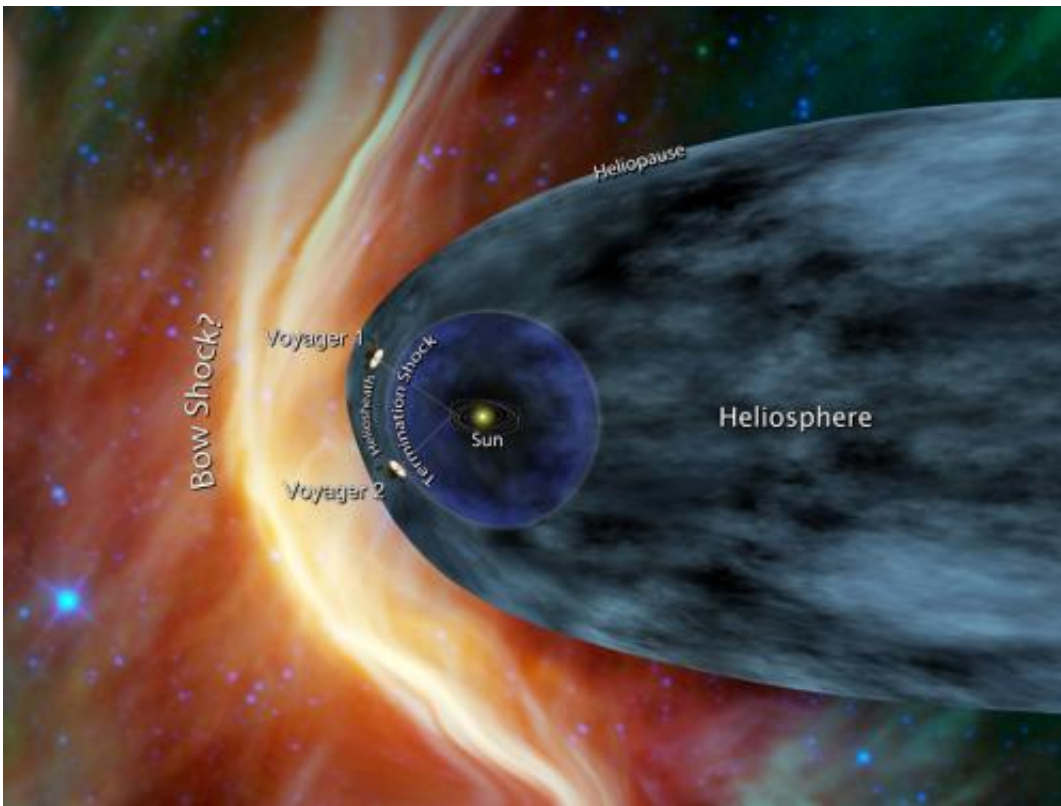


Recalculating the distance to interstellar space

June 15 2011, by Jia-Rui C. Cook



This artist's concept shows NASA's two Voyager spacecraft exploring a turbulent region of space known as the heliosheath, the outer shell of the bubble of charged particles around our sun. After more than 33 years of travel, the two Voyager spacecraft will soon reach interstellar space, which is the space between stars. Image Credit: NASA/JPL-Caltech

(PhysOrg.com) -- Scientists analyzing recent data from NASA's Voyager

and Cassini spacecraft have calculated that Voyager 1 could cross over into the frontier of interstellar space at any time and much earlier than previously thought. The findings are detailed in this week's issue of the journal *Nature*.

Data from Voyager's low-energy charged particle instrument, first reported in December 2010, have indicated that the outward speed of the charged particles streaming from the sun has slowed to zero. The stagnation of this solar wind has continued through at least February 2011, marking a thick, previously unpredicted "[transition zone](#)" at the edge of our solar system.

"There is one time we are going to cross that frontier, and this is the first sign it is upon us," said Tom Krimigis, principal investigator for Voyager's low-energy charged particle instrument and Cassini's [magnetospheric imaging](#) instrument, based at the Johns Hopkins University Applied Physics Laboratory in Laurel, Md.

Krimigis and colleagues combined the new Voyager data with previously unpublished measurements from the ion and neutral camera on Cassini's magnetospheric imaging instrument. The Cassini instrument collects data on [neutral atoms](#) streaming into our solar system from the outside.

The analysis indicates that the boundary between interstellar space and the bubble of charged particles the sun blows around itself is likely between 10 and 14 billion miles (16 to 23 kilometers) from the sun, with a best estimate of approximately 11 billion miles (18 billion kilometers). Since Voyager 1 is already nearly 11 billion miles (18 billion kilometers) out, it could cross into [interstellar space](#) at any time.

"These calculations show we're getting close, but how close? That's what we don't know, but Voyager 1 speeds outward a billion miles every three years, so we may not have long to wait," said Ed Stone, Voyager project

scientist, based at the California Institute of Technology in Pasadena.

Scientists intend to keep analyzing the Voyager 1 data, looking for confirmation. They will also be studying the Voyager 2 data, but Voyager 2 is not as close to the edge of the solar system as [Voyager 1](#). Voyager 2 is about 9 billion miles (14 billion kilometers) away from the sun.

Provided by JPL/NASA

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