

NEW MISSION TO TAKE FIRST PEEK AT SUN'S POLES: NASA

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File photo. To prepare for arriving solar storms, scientists monitor the Sun's magnetic field. | Photo Credit: [AP](#)

NASA, in collaboration with the European Space Agency (ESA), is launching a new spacecraft next month to snap the first pictures of the Sun's north and south poles, the US space agency announced on Tuesday.

The Solar Orbiter spacecraft will have its first opportunity to launch from Cape Canaveral in the U.S. on February 7, 2020, NASA said in a statement.

The spacecraft will use Venus's and the Earth's gravity to swing itself out of the ecliptic plane — the swath of space, roughly aligned with the Sun's equator, where all planets orbit.

“Up until Solar Orbiter, all solar imaging instruments have been within the ecliptic plane or very close to it,” said Russell Howard, a space scientist at the Naval Research Lab in the US.

“Now, we'll be able to look down on the Sun from above,” said Mr. Howard, who is also the principal investigator for one of Solar Orbiter's ten instruments.

The Sun plays a central role in shaping space around us. Its massive magnetic field stretches far beyond Pluto, paving a superhighway for charged solar particles known as the solar wind.

When bursts of solar wind hit Earth, they can spark space weather storms that interfere with our GPS and communications satellites — at their worst, they can even threaten astronauts, the researchers said.

To prepare for arriving solar storms, scientists monitor the Sun's magnetic field.

However, their techniques work best with a straight-on view, and the steeper the viewing angle, the noisier the data.

The sidelong glimpse we get of the Sun's poles from within the ecliptic plane leaves major gaps in the data, according to NASA.

“The poles are particularly important for us to be able to model more accurately,” said Holly Gilbert, NASA project scientist for the mission.

“For forecasting space weather events, we need a pretty accurate model of the global magnetic field of the Sun,” Ms. Gilbert said.

The Sun's poles may also explain centuries-old observations, the researchers said.

In 1843, German astronomer Samuel Heinrich Schwabe discovered that the number of sunspots — dark blotches on the Sun's surface marking strong magnetic fields — waxes and wanes in a repeating pattern.

Today, we know it as the approximately-11-year solar cycle in which the Sun transitions between solar maximum, when sunspots proliferate and the Sun is active and turbulent, and solar minimum, when they're fewer and it's calmer.

"But we don't understand why it's 11 years, or why some solar maximums are stronger than others," Ms. Gilbert said.

Observing the changing magnetic fields of the poles could offer an answer, NASA said.

The only prior spacecraft to fly over the Sun's poles was also a joint ESA/NASA venture.

Launched in 1990, the Ulysses spacecraft made three passes around our star before it was decommissioned in 2009.

However, Ulysses never got closer than Earth-distance to the Sun, and only carried what is known as in situ instruments — like the sense of touch, they measure the space environment immediately around the spacecraft.

Solar Orbiter, on the other hand, will pass inside the orbit of Mercury carrying four in situ instruments and six remote-sensing imagers, which see the Sun from afar.

"We are going to be able to map what we 'touch' with the in situ instruments and what we 'see' with remote sensing," said Teresa Nieves-Chinchilla, NASA deputy project scientist for the mission.

After years of technology development, it will be the closest any Sun-facing cameras have ever gotten to the Sun, according to NASA.

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