

# 1st Peek at Sun's Poles

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**Context:** NASA, in collaboration with the European Space Agency (ESA), is launching a new spacecraft 'Solar Orbiter' to snap the first pictures of the Sun's north and south poles

- 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.
- All solar imaging instruments till now have been within the ecliptic plane, look down on the Sun from above
- The Sun has a massive magnetic field that 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.
- 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,
- The poles are particularly important to be able to model more accurately
- 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 there is no explanation as to why it is 11 years. Observing the changing magnetic fields of the poles could offer an answer,

Other

- 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.