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Rosetta ready for attempt to regain contact with Philae

Starting this Thursday 12 March, the Rosetta orbiter will try to regain contact with the Philae lander currently 'asleep' on the surface of comet Churyumov-Gerasimenko. If the lander wakes up as hoped, teams at the mission's Science Operations and Navigation Centre (SONC) at CNES's Toulouse Space Centre (CST) are all set to receive the results of its first health check and a press conference will be webcast live from the CST.

With every passing day, comet Churyumov-Gerasimenko is getting closer to the Sun and picking up speed on its elliptical orbit. The European Space Agency (ESA), in charge of the mission, CNES and DLR, the German aerospace agency, have decided to attempt to resume contact with Philae this month. Before they could do this, they had to wait for the Rosetta orbiter to be in the right position overhead and for optimum solar illumination conditions for the lander. These conditions will be met between 12 and 20 March. The question now is: Will Philae show any signs of life?

“Although the wider Philae community has been poring over the data from Rosetta's OSIRIS and VIRTIS instruments since the landing, we haven't been able to pinpoint Philae's position,” explains Philippe Gaudon, Rosetta Project Leader at CNES. “And we're not sure which way it's pointing with respect to the Sun or how high the rocks and cliffs around it are. However, we do know that Philae must be somewhere in the comet's southern hemisphere, so we're sure that the seasonal conditions on the surface will be more favourable as it approaches the Sun.”

Several steps before Philae can respond

The first step for Philae will be to accumulate enough energy from its solar panels to reach its threshold temperature of -45 °C . Only then will it be able to fire up its central unit again and send commands to the platform and 10 science instruments. A round-trip signal to Rosetta, for which it will need to switch on a full two-way transmitter, will require even more power (about 18 watts). Philae will then be able to receive commands from the orbiter but it won't yet be ready to respond. For that, it will have to wait for 'midday' on the comet, which is the ideal time as the temperature and electrical power generated vary with the day/night cycle.

CNES supplied the telecommunications system that is set to be used to attempt contact with Philae in the days ahead. This system comprises two antennas on the Rosetta orbiter and two on the lander. “The system worked well during the first science phase last November, even when Philae bounced off the comet's surface, so we're confident it'll work now,” says Philippe Gaudon.

What if Philae shows no signs of life in March?

“That would mean we were too optimistic and that the amount of daily sunlight hasn't increased sufficiently since last November. It could also mean there's still too much shade on Philae's upper solar panel, limiting the solar energy it can receive,” Gaudon explains. “Whatever happens, the situation can only improve as the months go by, so we'll keep trying to contact Philae regularly.”

In addition to efforts to locate Philae on the comet's surface, the SONC has been preparing various scenarios for the instruments with the lander's science team for if the lander wakes up. One would use only the solar energy from the panels, while another more complex scenario would use Philae's secondary batteries to build up as much power as possible, for example enough needed to activate its drill or ovens. A science meeting is scheduled in Paris to define priorities for the first science activities planned after Philae wakes up.

About the Rosetta mission

Rosetta is an ESA mission with contributions from its member states and NASA. Rosetta's Philae lander is provided by a consortium led by the German Aerospace Centre DLR, the Max Planck Institute for Solar System Research (MPS), CNES and ASI, the Italian space agency.

See the full interview with Philippe Gaudon on CNES's Rosetta blog:
"We're reasonably optimistic that Philae is going to wake up."

www.cnes.fr/rosetta-blog

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