

Rosetta, Philae to reunite on comet for Sept 30 mission end

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Rosetta, along with its space probe Philae, is being used to carry out a detailed study of comet 67P/Churyumov-Gerasimenko

After nearly two years apart, Europe's Rosetta spacecraft will join stranded robot probe Philae on September 30 on the icy surface of a comet hurtling through space, their eternal resting place, mission control said Thursday.

In orbit around comet 67P/Churyumov-Gerasimenko, which is speeding further and further away from the Sun and its battery-charging rays, the

trailblazing space laboratory is starting to run low on energy.

"Rosetta is reaching the end of its natural life," said the European Space Agency (ESA), announcing the swansong on a captivating 12-year quest.

"The time has come for the orbiter to join its companion Philae on Churyumov-Gerasimenko," added France's CNES space agency.

After its crashlanding, communications with Rosetta will be severed once and for all, closing the historic mission to unravel the secrets of comets—believed to be time capsules from the birth of the Solar System.

"This announcement may at first sight appear a little sad, given how people all over the world identified with this remarkable mission," said CNES president Jean-Yves Le Gall.

"But for Rosetta and Philae it will be a fitting end and the chance to obtain new measurements and close-up pictures of the comet that will yield new data for the world's scientific community."

The data obtained from Rosetta and Philae will continue to be analysed for months and years to come, with many more discoveries thought possible.

The 1.3-billion-euro (\$1.4-billion) mission, approved in 1993, saw Rosetta launched into space in March 2004, with a comet lander dubbed Philae riding piggyback.

Space age triumph

The pair travelled some 6.5 billion kilometres (four billion miles)—aided by gravity boosts from Earth and Mars—before entering

the comet's orbit in August 2014.

Three months later, Rosetta sent the 100-kilogramme (220-pound) Philae probe down to the comet surface, starting a deep-space saga closely watched around the world via cartoon recreations of the pioneering pair.

Philae's nail-biting exploits earned it a loyal Twitter following.

The washing machine-sized robot, with 10 instruments for sniffing and prodding, bounced several times after its harpoons failed to fire into the comet surface.

It ended up in a ditch shadowed from the Sun's battery-replenishing rays, but still managed to run about 60 hours of experiments and send home reams of valuable data before entering standby mode.

As 67P neared the Sun on its elongated orbit, Philae emerged from hibernation in June 2015 and sent a two-minute message via Rosetta, eliciting great excitement on Earth.

But after eight intermittent communications, the lander went permanently silent on July 2015.

Rosetta has continued to probe the comet from a distance, without catching sight of its long-lost charge.

But now, as 67P heads towards the orbit of Jupiter in the outer reaches of our Solar System, the craft has "significantly reduced" solar power for operating its instruments, and reduced bandwidth for sending science data back to Earth.

Ground controllers will start changing Rosetta's orbit in August, bringing

it progressively nearer the surface.

"The last six weeks will be particularly challenging as we fly eccentric orbits around the comet—in many ways this will be even riskier than the final descent itself," said ESA spacecraft operations manager Sylvain Lodiot.

Rosetta had been in hibernation for 31 months of its decade-long journey towards 67P.

But this time, the craft will reach a point so far from the Sun at 850 million km that it would likely not survive another 6.5-year comet orbit for a battery recharge later.

It was thus decided to land the craft, allowing closer-than-ever science observations on its final approach.

"And what better way for Rosetta to bow out than with a final, parting kiss!" said Le Gall.

Rosetta had taken unprecedented images of the comet surface, analysed gases coming off its surface and scanned its insides.

From the mission we have learnt that comets contain organic molecules, the building blocks of life.

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