

Europe aims for first comet landing Nov. 11 (Update 2)

December 10 2013, by Frank Jordans



This undated picture publicly provided by the European Space Agency ESA shows an artist's impression of the Philae lander. The European Space Agency has set a tentative date for the first landing of a spacecraft on a comet. ESA says Tuesday Dec. 10, 2013 its Rosetta probe will wake up from hibernation Jan. 20 before chasing down comet 67P/Churyumov-Gerasimenko. If all goes according to plan, Rosetta will launch a lander onto the surface of the comet on Nov. 11, 2014. (AP Photo/ESA ATG medialab , Astrium E, Viktor)

It's been likened to a parachutist trying to land on a mountaintop. Or a person attempting to leap from one speeding car to another.

The European Space Agency is planning to land an unmanned spacecraft on a comet next year in an unprecedented and exquisitely tricky mission that has been underway for almost a decade and is about to enter a critical new phase.

The agency announced Tuesday that its Rosetta probe, which has been journeying through space since its launch in 2004, will be awakened from hibernation next month and will aim to drop a lander onto the icy surface of comet 67P/Churyumov-Gerasimenko on Nov. 11, 2014.

The plan is different from NASA's Deep Impact mission, which used a probe to fire a projectile into a comet in 2005 and create a plume of matter for scientists to study. That was just a drive-by compared with the rendezvous the Europeans are planning.

Scientists hope that by flying Rosetta alongside the comet and sending down a barrel-size lander to collect and analyze samples, they will get an even better idea of what comets are made of and what role they played in the formation of our solar system.

"Nobody has ever done this before," said Paolo Ferri, head of mission operations at the European Space Agency.

Ferri noted that while NASA managed to land a probe on an asteroid in 2001, comets are much more volatile places because they constantly release dust and gas that can harm a spacecraft. A comet is essentially a dirty snowball; an asteroid is a rock.

To catch 67P as it orbits the sun at up to 100,000 kph (62,000 mph), Rosetta has made several fly-bys of Earth, Mars and the sun, using their

gravity to accelerate.



This publicly provided image by the European Space Agency ESA shows an artist's impression of the Rosetta orbiter deploying the Philae lander to comet 67P/Churyumov–Gerasimenko. The image is not to scale; the Rosetta spacecraft measures 32 m across including the solar arrays, while the comet nucleus is thought to be about 4 km wide. The European Space Agency has set a tentative date for the first landing of a spacecraft on a comet. ESA says Tuesday Dec. 10, 2013 its Rosetta probe will wake up from hibernation Jan. 20 before chasing down comet 67P/Churyumov-Gerasimenko. If all goes according to plan, Rosetta will launch a lander onto the surface of the comet on Nov. 11, 2014. (AP Photo/ESA, C.Carreau)

Once the spacecraft picked up sufficient speed and was on course to

rendezvous with the comet, ESA put Rosetta into hibernation for more than two years to conserve energy.

This also gave engineers the time to find workarounds for two glitches that threatened the mission: a problem with two of the four reaction wheels used to turn the spacecraft, and a small helium leak that could affect the thrusters vital for its final maneuvers.

For now, scientists have a tense wait to see whether the probe wakes up as planned when its alarm clock goes off at 1000 GMT (5 a.m. EST) on Jan. 20.

The spacecraft will be about 800 million kilometers (500 million miles) from Earth at the time, and signals will take 45 minutes to travel each way.

If all goes according to plan, Rosetta will begin searching for 67P—a lump of rock and ice about four kilometers (2.5 miles) in diameter that is invisible to the naked eye.

By November, Rosetta will have drawn up alongside the comet and found a suitable place for the lander, called Philae.

The cylindrical lander—which is roughly the size of a chemical drum, at about 80 centimeters high by 100 centimeters wide (3.3 feet by 2.6 feet)—will gently glide down to the surface and latch onto the comet with a harpoon, to prevent it from drifting off into space because of the icy lump's weak gravity.

Using drills, Philae will dig up samples and analyze them with its on-board instruments.

Researchers hope to gain fascinating insights, because comets have

remained largely unchanged since our solar system formed.

"This time capsule's been locked away for 4.6 billion years," said ESA director of science Mark McCaughrean.

One key question scientists hope to answer is whether comets are responsible for the water on Earth.

Rosetta and Philae will keep sending back data until their batteries die or the debris streaming off the comet irreparably damages their sensitive instruments.

Ferri said Philae's useful lifetime could be as short as three days, while Rosetta is unlikely to survive beyond late 2016.

NASA, meanwhile, is also planning another space rock mission between 2019 and 2021. The agency is looking into sending a robotic spaceship to lasso a small asteroid and haul it close to the moon, where spacewalking astronauts would explore it.

More information: www.esa.int/rosetta

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