Beat: Arts

UPDATE 2 -- Comet-chasing `Rosetta` spacecraft wakes up from hibernation

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USPA News - The `Rosetta` spacecraft, which is chasing a comet and plans to drop a lander onto its surface later this year, woke up from nearly three years of hibernation on Monday and sent a message back to Earth, the European Space Agency (ESA) said. The spacecraft was woken up by a pre-programmed internal `alarm clock,` warming up its key navigation instruments, coming out of a stabilizing spin, and aiming its main radio antenna at Earth.

It then sent a message that was received eight hours later by NASA`s Goldstone ground station in California at 18:18 GMT, just minutes before the first window of opportunity to receive a signal was to close. "This was one alarm clock not to hit snooze on, and after a tense day we are absolutely delighted to have our spacecraft awake and back online," said Fred Jansen, ESA`s Rosetta mission manager. ESA employees at mission control in the German city of Darmstadt erupted in cheers when the precious signal was received in California. "We have our comet-chaser back. With Rosetta, we will take comet exploration to a new level," said Alvaro Giménez, ESA`s Director of Science and Robotic Exploration. "This incredible mission continues our history of firsts at comets, building on the technological and scientific achievements of our first deep space mission `Giotto,` which returned the first close-up images of a comet nucleus as it flew past Halley in 1986." Since its launch from Europe`s Spaceport in Kourou in March 2004, Rosetta has traveled to a distance of some 800 million kilometers (500 million miles) from the Sun and close to the orbit of Jupiter, passing by Earth three times and Mars once, and flying past asteroids Steins and Lutetia along the way. Although still 9 million kilometers (5.6 million miles) away, it is now closing in on its destination, Comet 67P/Churyumov"Gerasimenko, as it moves farther into the inner Solar System. Rosetta, which operates on solar energy alone, was placed into deep space hibernation in June 2011 as it cruised to a distance of nearly 800 million kilometers (500 million miles) from the Sun, but now at `only` 673 million kilometers (418 million miles) from the Sun, there is enough solar energy to fully power the spacecraft. Comets are considered by scientists to have been the primitive building blocks of the Solar System and likely helped bring water to Earth, and perhaps even the ingredients for life. But many fundamental questions about the mysterious objects remain, which ESA`s mission hopes to provide the answers to. After Monday`s wake-up call, essential health checks began before the eleven instruments on the orbiter and ten on the lander will be fully turned on. The probe`s first images of 67P/Churyumov-Gerasimenko are expected in May, when the spacecraft is still 2 million kilometers (1.2 million miles) from its target, before an important manoeuvre later that month to line it up for its rendezvous with the comet in August. "We have a busy few months ahead preparing the spacecraft and its instruments for the operational challenges demanded by a lengthy, close-up study of a comet that, until we get there, we know very little about," said Andrea Accomazzo, ESA`s Rosetta operations manager. ESA said it hopes the eventual results will help decipher the role of comets in the formation of the Solar System. After rendezvousing with the comet in August, Rosetta will start with two months of extensive mapping of the comet`s surface, measuring the comet`s gravity, mass and shape, and assess its gaseous, dust-laden atmosphere that is known as a coma. The orbiter will also probe the plasma environment and analyze how it interacts with the Sun`s outer atmosphere, the solar wind. Using the crucial data, scientists will then choose a landing site for the mission`s 100-kilogram (220-pound) Philae probe. The landing is currently scheduled to take place on November 11 and will represent the first time in history that an attempt has been made to land on a comet. Philae, which will have to use its ice screws and harpoons to stop it from rebounding back into space after touchdown, is expected to send back a panorama of its surroundings, as well as high-resolution photos of the surface. It will also perform an analysis of the composition of the ices and organic material, including drilling down to 23 centimeters below the surface and feeding samples to its on-board laboratory for analysis. "We will face many challenges this year as we explore the unknown territory of comet 67P/Churyumov-Gerasimenko and I`m sure there will be plenty of surprises, but today we are just extremely happy to be back on speaking terms with our spacecraft," said Matt Taylor, ESA`s Rosetta project scientist. After carrying out the scientific measurements, the focus of the mission will then move to the `escort` phase, during which Rosetta will stay alongside the comet as it moves closer to the Sun, monitoring the conditions on the surface as the comet warms up and its ices sublimate. The comet will reach its closest distance to the Sun in August 2015 at a distance of about 185 million kilometers (115 million miles), roughly between the orbits of Earth and Mars. Rosetta will follow the comet throughout the remainder of 2015, as it heads away from the Sun and activity begins to subside.

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