

## ROSETTA COMET COMES ALIVE

A spacecraft from Earth is about to do something no spacecraft has ever done before: orbit a comet and land on its surface.

Right now, the European Space Agency's Rosetta probe is hurtling toward **Comet 67P/Churyumov-Gerasimenko**. The spacecraft's mission is to study the comet at close-range as it transforms from a quiet nugget of ice and rock, frozen solid by years spent in deep space, to a sun-warmed dynamo spewing jets of gas and dust into a magnificently evolving tail. Comet 67P is coming alive and it is even more active than expected.

Launched in 2004, Rosetta has spent the past few years in hibernation as it chased the comet across the Solar System. In January of 2014, with its destination in sight, Rosetta woke up and turned on its cameras. At first, the comet looked like a dimensionless pinprick, inactive except for its quiet motion through space. **Then, on May 4th a bright cloud appeared around the nucleus and it began to look like a real comet.** In a few months from now, Rosetta will be deep inside this cloud of dust and en route to the origin of the comet's activity.

Spacecraft from NASA, ESA and other space agencies have flown by comets before. A whole armada of spacecraft visited **Comet Halley** in the mid-1980s. Other notable examples include NASA's Stardust mission, which flew through the tail of **Comet Wild** in 2004 and returned the samples to Earth two years later; and the Deep Impact spacecraft, which in 2005 dropped a projectile into **Comet 9P/Tempel**, blowing a hole in its nucleus so that researchers could look inside.

**Rosetta will do much more. It will orbit 67P for 17 months and watch the comet evolve toward the sun and back out again.** And in November a European-built lander will descend from the Rosetta spacecraft and touches down on the comet's surface. Once it has fastened itself, the lander will commence an unprecedented first-hand study of a comet's nucleus while Rosetta continues to monitor developments overhead. The lander's name is "Philae" after an island in the Nile, **the site of an obelisk that helped decipher—you guessed it—the Rosetta Stone.** The Rosetta Stone is a granodiorite stele inscribed with a decree issued at Memphis in 196 BCE



Jean-François Champollion 1790 – 1832 was a French scholar, philologist and orientalist. At he age of 16 he could speak 12 languages. He published the Rosetta Stone hieroglyphs in 1822, noticing that the Egyptian writing system was a combination of phonetic - ideographic signs

on behalf of King Ptolemy V. A stele is a stone or wooden slab, erected as a monument, very often for commemorative purposes. Stelae may be used for government notices or as territorial markers to mark borders or delineate land ownership. They very often have texts and decoration inscribed, carved in relief or painted onto the slab. **The Rosetta decree appears in three scripts:** the upper text is Ancient Egyptian hieroglyphs, the middle portion Demotic script, and the lowest Ancient Greek. Because it presents essentially the same text in all three scripts, it provided the key to the modern understanding of Egyptian hieroglyphs.

It was discovered near the town of Rashid (Rosetta) in the Nile Delta in 1799 by an astute soldier, **Pierre-François Bouchard**, of the Napoleonic expedition to Egypt. After the defeat of the French by the British in 1802 the stone was brought to the British Museum in London. In 1822 a translation was announced by Jean-François Champollion in Paris.

