Media information

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Rosetta: 100 kilometres to "touchdown"

The Rosetta spacecraft is approaching just 100 kilometres from its target comet, "Chury", today. After a ten-year journey, the Bernese instrument, ROSINA, will soon "reach" the first molecules of the comet's gas tail.

"We have reached comet Chury's orbit around the sun", says Kathrin Altwegg from the Centre for Space and Habitability (CSH) at the University of Bern. Altwegg is the project leader for the ROSINA instrument, which was developed at the CSH and is designed to analyse the gases coming from the comet. ROSINA consists of two mass spectrometers and a pressure sensor and should, amongst other things, answer the question of whether comets brought water and organic molecules to Earth. Organic molecules formed the basic building blocks for the development of life on Earth.

Rosetta will be slowed down to match comet Churyumov-Gerasimenko's orbit since it would otherwise fly past. Its speed relative to the comet is now a little less than one metre per second. "That's less than three kilometres per hour, making its speed slower than a pedestrian", says Annette Jäckel, a research associate on the ROSINA project. Rosetta will now hover above the comet on the sun side for a long period.

"For the next two weeks we will examine the comet from a distance of 100 kilometres", says Jäckel. "That corresponds to the Jungfrau of the Bernese Alps as seen from Zurich." Rosetta will then approach to a distance of 50 kilometres - which corresponds to the distance from Bern - until it moves into bound orbit about the comet at a distance of 30 kilometres.

In search of a landing site

Rosetta's primary goal at this stage will be to measure the comet three-dimensionally and to find a landing site for the "Philae" landing module which will be put down onto the comet's surface in November.
Rosetta's OSIRIS high resolution camera will be used for the measurement. Also with Bernese involvement: OSIRIS was co-developed by Nicolas Thomas of CSH. "Images already show that the comet has an unusual, two-part shape. In addition, we see indications of surface ice and outgassing from the surface", says Thomas.

The landing site should be in the summer hemisphere of the comet so that the landing module can charge its batteries. There cannot be too many holes and stones, and similarly no craters. "There also can't be too much gas so that the landing module is not blown off - and the checking of this is, again, a job for ROSINA", says Jäckel. ROSINA has already taken measurements during its journey to the comet and, according to its "support team", is functioning well. "In all likelihood, we will already be able to measure the first comet molecules by the middle of August at the latest", Jäckel exults. "It's all really starting now!"

The Bern team has a lot to do: in the coming weeks and months, the measurements from ROSINA need to be prepared and tested in accordance with scientific guidelines and the measuring data already collected needs to be interpreted.

The Bernese team's study
ROSINA (the Rosetta Orbiter Spectrometer for Ion and Neutral gas Analysis) is one of the key experiments of the Rosetta mission. Both mass spectrometers and the pressure sensor detect, among other things, the molecular composition of the coma and the gas layer at the comet core, as well as the temperature and speed of the gas. This provides information about the origin of comets and thus also about the origin of our solar system. OSIRIS is Rosetta's main imaging system and consists of a wide-angle camera and a narrow-angle camera with a joint control. It allows high resolution images of the comet's nucleus and coma. The pictures will be analysed by CSH together with an international team.

More information:
http://space.unibe.ch/ro sina.html /
http://space.unibe.ch/index.php?id=3355

Captions:
1) Like a rubber duck: Churyumov-Gerasimenko at a distance of 1000 km. The picture was acquired by the OSIRIS Narrow Angle Camera. Credits: Credits: ESA/Rosetta/MPS for OSIRIS Team

2) One of ROSINAs twin instruments at the Center of Space and Habitability (CSH) of the University of Bern. It serves as a model for ROSINAs measurements in space. Credits: University of Bern.
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