

Rosetta instrument will make invaluable discoveries, says ESA scientist Matt Taylor

December 23 2014, by Tomasz Nowakowski, Astrowatch.net



On Dec. 10, ESA announced the latest important discovery regarding comet 67P/Churyumov–Gerasimenko. Rosetta spacecraft orbiting the comet has found the water vapor from its target to be significantly different to that found on Earth. The discovery made by Rosetta Orbiter Spectrometer for Ion and Neutral Analysis (ROSINA) fuels the debate on the origin of our planet's oceans. That's not all, ESA's Rosetta project scientist, Matt Taylor, believes that ROSINA will make more key findings for our understanding of the origin of life. "ROSINA is continuing to take measurements and will for the rest of the mission,"

Taylor told astrowatch.net. "It is making and will make invaluable detections of the composition of the comets atmosphere, as well as monitoring its density."

ROSINA is a combination of two [mass spectrometers](#) and a [pressure sensor](#). The mass spectrometers determine the composition of the [comet](#)'s atmosphere and ionosphere, measure the temperature and bulk velocity of the gas and ions, and investigate reactions in which they take part. The ROSINA pressure sensor is capable of measuring both total and ram pressure, and will be used to determine the gas density and rate of radial gas flow.

"It can detect many different kinds of molecules and get to the heart of the constituents of the ancient comet, giving us unprecedented insight into what the conditions were at the beginning of the solar system," Taylor revealed.

No single instrument could have the capabilities required to accomplish the ROSINA science objectives, so a three-sensor approach has been adopted. Each sensor is optimized for a part of the scientific objectives, while at the same time complementing the other sensors.

The latest results were the most anticipated, because the origin of Earth's water is still an open question. Taylor noticed that those findings have put recent Herschel results into context and agree with results from the Giotto mission. "It is a very important result and was of the most anticipated, if only that it was one of the first we would be able to make," he said.

In January 2014, ESA's Herschel mission discovered [water vapor](#) around dwarf planet Ceres, and in 1986, ESA's Giotto was the first spacecraft to make close up observations of a comet.

Comets in particular are unique tools for probing the early Solar System. They harbor material left over from the protoplanetary disc out of which the planets formed, and therefore should reflect the primordial composition of their places of origin.

Source: [Astrowatch.net](https://www.astrowatch.net)

Citation: Rosetta instrument will make invaluable discoveries, says ESA scientist Matt Taylor (2014, December 23) retrieved 23 May 2024 from <https://phys.org/news/2014-12-rosetta-instrument-invaluable-discoveries-esa.html>

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