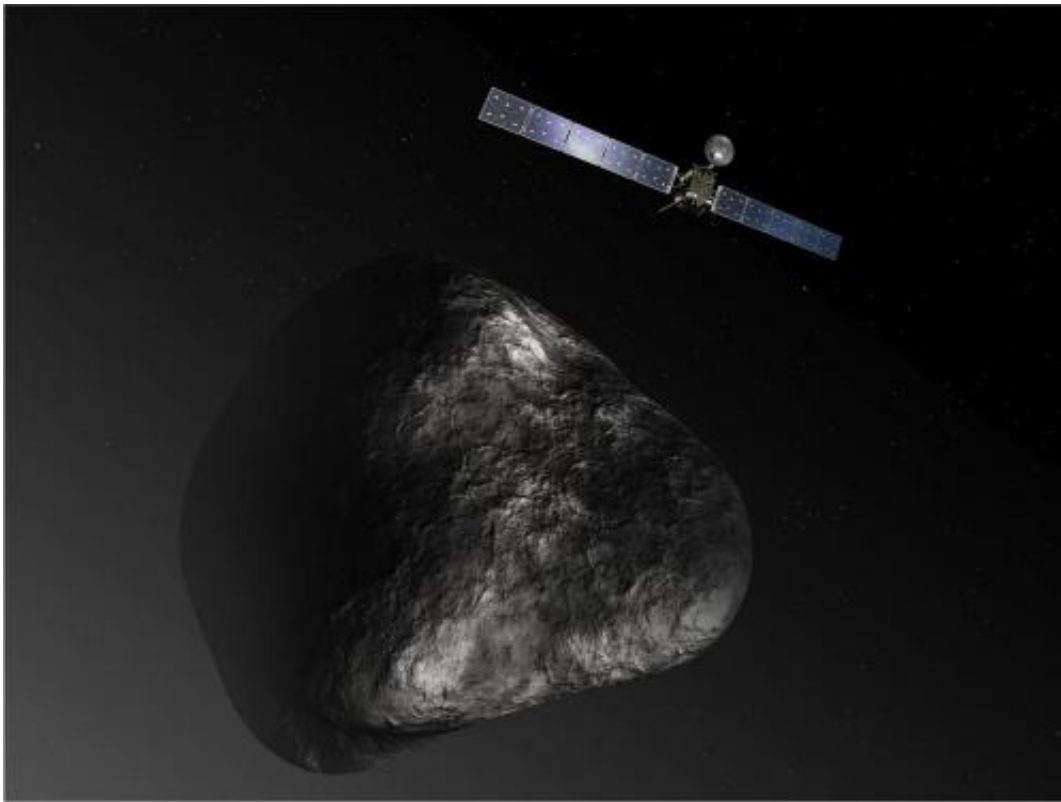


From doomsday to fact: Science lifts veil on comets

November 12 2014, by Richard Ingham



This artist's impression shows the Rosetta orbiter at comet 67P/Churyumov-Gerasimenko. The image is not to scale. Credit: ESA/ATG Medialab

For millennia, the sight of a comet filled humans with awe or dread.

The birth of Jesus, the assassination of Julius Caesar, the Great Plague of London, the coming of war or peace, bountiful harvests or famine... all

thought to be portended by cosmic herald.

Bit by bit, mysticism about comets has been replaced by fact as scientists discover more about these epic and ancient travellers of the skies.

As it turns out, comets may be more extraordinary than even the deepest superstition could imagine.

They may even have brought life to our planet, according to some theories.

For decades, astrophysicists have debated whether, at the dawn of our Solar System, comets peppered Earth with some of the chemical essentials for life as we know it.

The Rosetta mission hopes to provide an answer.

It comprises a three-tonne orbiter which on Wednesday sent down a 100-kilogramme (220-pound) robot lab, Philae, to Comet 67P/Churyumov-Gerasimenko.

"Comets are the most ancient objects in the Solar System," Francis Rocard of France's National Centre for Space Studies (CNES), told AFP.

"We want to know if comets played a part in providing Earth with water and carbon. There is no doubt that the results from Rosetta and Philae will shake up what we know."

Dubbed "dirty snowballs" by US astronomer Fred Whipple, comets are deemed to be clusters of primeval carbon and ice, typically a few kilometres (miles) across.

Blacker than coal, they were formed shortly after the Sun flared into life in a halo of dust and gas—the stuff that eventually formed the planets and other bodies.

Today, the Solar System is considered a pretty quiet place compared to 4.6 billion years ago, when it was a shooting gallery.

The nascent Earth would have been whacked over and over again by comets and asteroids, swelling the planet in size and depositing ice, which on some theories became today's oceans.

"This would have created a wonderful culture medium—a liquid enabling highly rich carbon material to react and create prebiotic chemistry," said Rocard.

"It would have led to the first membranes and ultimately the first cells—life itself," he said.

The key to confirming this theory lies in the ratio of hydrogen and deuterium on the comet, which will be compared to the chemical make-up of water on Earth.

Doomed to orbit the Sun in elliptical circuits, comets undergo thermal and gravity stress as they near the star.

Some of their ice is melted and transformed into gusts of gas, the bright "coma" around a comet's head.

Hairy star

The gassy wake, and dust loosened by the melting ice, creates a spectacular tail reflected in the Sun's rays and may stretch across millions of kilometres.

The word for comet comes from "stella cometa"—Latin for "long-haired star".

The best-known is Halley's Comet, named after 17th-century English astronomer Edmond Halley, who was the first to show that comets orbit the Sun and return regularly.

Just over 5,000 comets have been observed since the first recorded sighting by Chinese skygazers around 240 BC.

But some experts believe there could be as many as a trillion out there, the European Space Agency says.

"Short period" comets take less than 200 years to complete an orbit. They are believed to return to the Kuiper Belt, just beyond the orbit of Neptune.

"Long period" comets return to the Oort Cloud, a vast, frigid, dark place on the Solar System's fringes.

Some of these last swung by more than 100,000 years ago, when Homo sapiens ventured out of Africa, at the start of our conquest of the planet.

© 2014 AFP

Citation: From doomsday to fact: Science lifts veil on comets (2014, November 12) retrieved 26 April 2024 from <https://phys.org/news/2014-11-doomsday-fact-science-veil-comets.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.