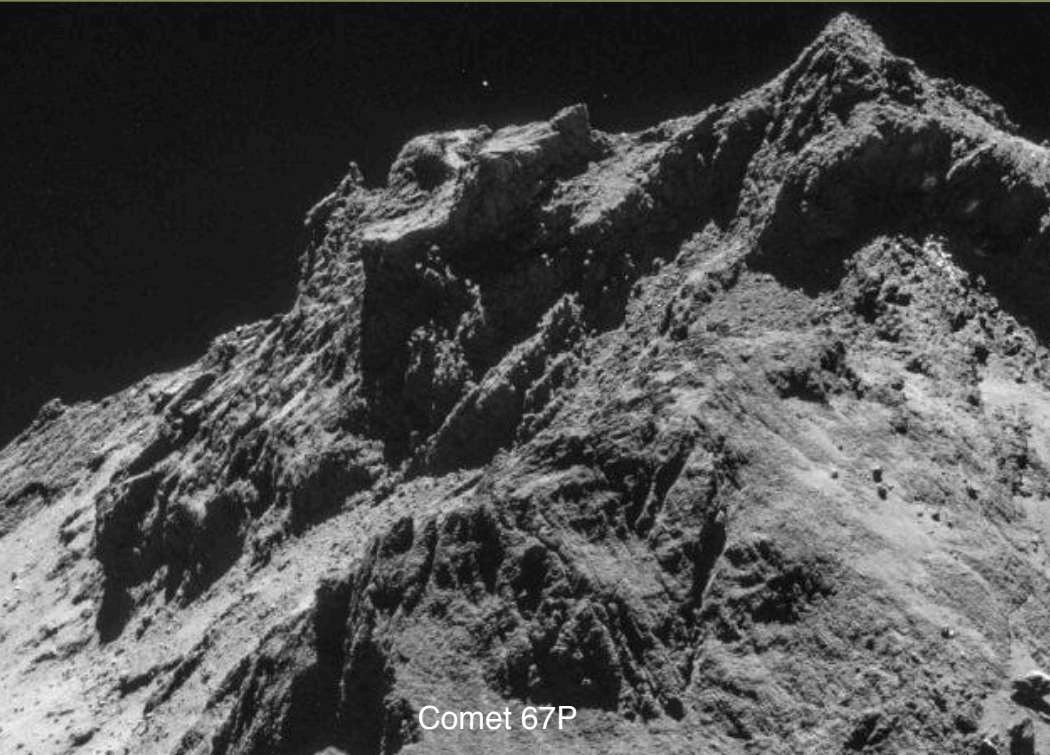


Tessmann Focal Points



Comet 67P

A Tale of Two Comets

This fall, the European Space Agency (ESA) made history when its Rosetta spacecraft encountered a comet called 67P (also known as Churyumov–Gerasimenko). Not only did it take 10 years to chase down the comet, but they imaged and took readings of the comet in unprecedented detail, adding a new chapter to our understanding of comets. To top off the achievement, they released a probe named Philae on November 12th, which landed on the comet's surface. Although the lander had problems recharging its batteries, it was still able to send back the first-ever measurements taken on the surface of a comet.

A few weeks earlier, space crafts from NASA, the ESA and the Indian Space Agency (ISRO) had a close encounter with another comet, named Siding Spring, making 2014 a banner year in comet exploration. Siding Spring came close enough to the planet Mars to have its long tail brush and interact with the Martian atmosphere. Because two rovers and three orbiting space craft are currently active around Mars, they were able to gather valuable data of this once-in-a-lifetime event. Mankind, for once, happened to be at the right place at the right time with the right instruments.

But you're probably asking, why all the fuss? Why should we even bother to study comets? Why send a spacecraft on a ten-year journey to intercept one?

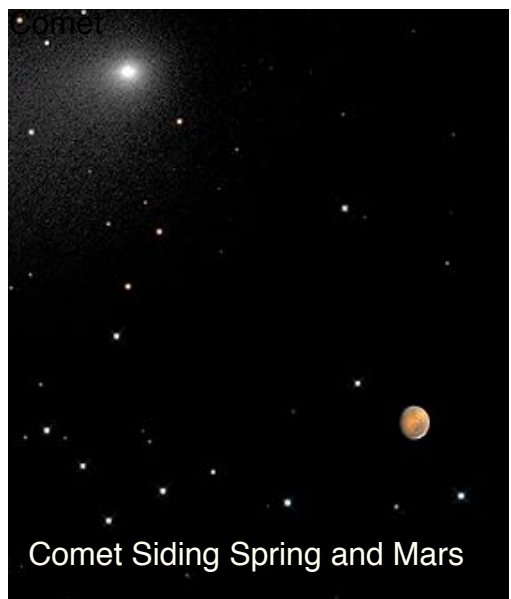
Comets have been, up to now, locked treasure chests that contained arcane information about what happened in our early solar system. On Earth, the original make-up of the material that formed our planet is long gone. It has been transformed, buried and no longer available for us to study due to plate tectonics and a myriad of other factors. If we wanted to know how the solar system formed, we needed

to search elsewhere. And that's where comets come in.

Comets are relics of that early formative period. If we can unlock their composition, we can travel back in time to ferret out what the original materials were. We're trying to find out if comets brought the building blocks of life – organic materials in the form of amino acids --to Earth. And also discover if comets contributed to the bringing of water to our planet. (There are other competing theories.)

Measurements taken from Siding Spring have already revealed eight metal ions, including sodium, magnesium and iron. The Philae lander "sniffed out" organic molecules on 67P. Early observations of Philae's landing indicate that a thick layer of ice, perhaps 8 ft. thick, is hidden under the comet's dusty surface. Data collected from the two comets will be studied for years to come.

There are literally billions of comets, some nearby and countless others beyond Pluto, in the distant, icy Oort cloud that surrounds our system. They are moments frozen in time, carrying the secrets of the earliest arrangement of the building blocks of our solar system. Comets are the keys to our understanding how planets, oceans and life formed in our solar system, perhaps the most fundamental mysteries of all.



Comet Siding Spring and Mars