

# Cosmic Chatter

Thoughts on space and human exploration

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## COMING FULL CIRCLE ON WATER IN THE COSMOS

*Editor's note: This story was originally posted 25 Jan 2014, but it's now graduated and become part of Astronomy 101! Please be aware that any references to events that seem current may not actually reflect events happening right now.*

*"...the most self-evident explanation from the markings themselves is probably the true one; namely, that in them we are looking upon the result of the work of some sort of intelligent beings. . . ."*

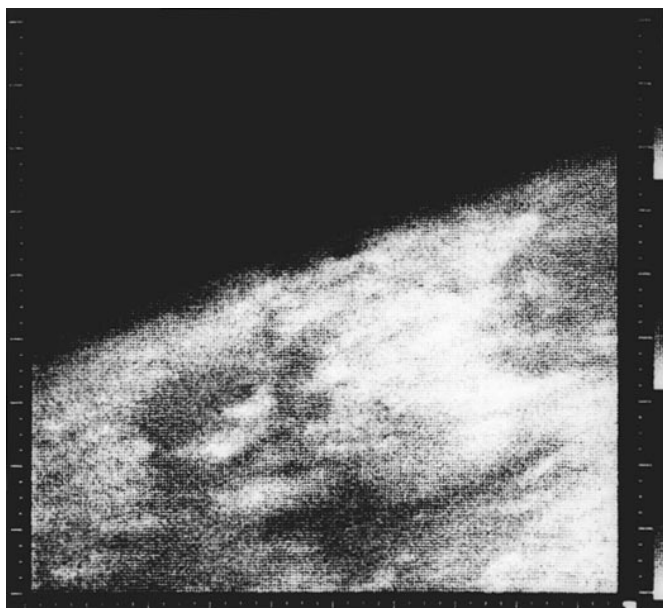
— Percival Lowell, 1894

It's been a remarkable journey. If, just recently, one were to become aware of our scientific endeavors in space, she might take for granted the abundance of water in our solar system. After all, it hardly seems that a week goes by without the discovery, here or there, of some new source. This week it was freshwater seas on ancient Mars; last week it was jets of water on the asteroid Ceres. A month ago it was geysers on Jupiter's moon Europa. A partial list might include:

- Earth (duh!)
- The Moon



desperate attempt to ferry water to a failing civilization. They were complete fiction. Nonetheless, the public ate it up. Lowell's vision of Mars would dominate for fifty years.



The first spacecraft image returned from another planet. (Image credit: NASA)

The year 1965 shattered all of that. The American spacecraft *Mariner 4* returned the first close-up images of Mars in July. The results were unambiguous: Mars was a desert. Images returned from the Moon had shown the same thing. Suddenly the Earth seemed unique. Water was fleetingly rare in the cosmos and our planet seemed to have the lion's share.

In the 1970s, the Viking landers only confirmed these notions. Observations from the surface of Mars showed it to be dry and devoid of life. The Apollo astronauts had found the same on Mars. Landings by the Soviet Union on Venus showed it to be even more harsh. In 1990, the *Voyager 1* probe sent back the image known as the Pale Blue Dot. Never before had the Earth seemed so fragile.

But, once again, our viewpoint was changing. *Mariner 9* and *Viking* had uncovered features on the surface which could have formed through erosion. In 1996, the *Mars Global Surveyor* orbiter reported the first discovery of water-formed minerals. Perhaps at one time in the past Mars had indeed been a wet world. More recently, Spirit, Opportunity, and Curiosity have further established Mars' wet past.

Our story, though, wouldn't start to come full circle until 2001. *Mars Odyssey*, peering down from orbit with its spectrometer, made the remarkable discovery that the soil of Mars did, in fact, contain water *today*. After that, the floodgates (no pun intended) were opened.

*Cassini* soon after found jets of nearly pure water shooting thousands of kilometers into space at the moon Enceladus. *Phoenix Mars Lander* would dig trenches and expose ice near the Martian pole.



Water ice uncovered by the *Phoenix Mars Lander* propulsion system. (Image credit: NASA)

While it's now clear that Earth is indeed alone in the solar system when it comes to surface water, oceans believed to exist under the surfaces of Europa and Enceladus mean that we're far from the only body with substantial water today.

So, it turns out we're not exactly back where we started. There are no sentient races on other worlds. No canals and no War of the Worlds. But the solar system is a far more dynamic place than it appeared fifty or sixty years ago. The Earth, it seems, is not alone after all.

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📅 January 26, 2014 / 👤 Morgan Rehnberg

🏷️ water, history

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