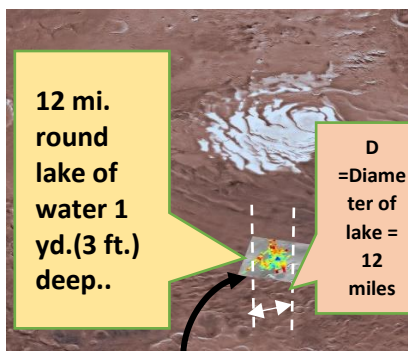


A Large Body of Water on Mars Is Detected, Raising the Potential for Alien Life

The discovery suggests that the liquid conditions beneath the icy southern polar cap may have provided one of the critical building blocks for life on the red planet



INTRODUCTION: Function of this application is to verify the last statement in this article..... **back-of-the-envelope calculation indicated (((several hundred million cubic meters of water. That's tens of billions of gallons.)))**

QUESTIONS: (a) Find radius(R) of lake?, In miles & ft. (b) Find area (A) of this round lake of water in ft.²?, (c) Find volume (V) of lake water in ft.³?, (d) Verify the lake is several hundred million cubic meters of water by converting volume in ft.³ to meters³?, (e) How many billions of gallons of water would this be?

HINTS: $A_{\text{circle}} = \pi R^2$, $R = D/2$, $V_{\text{cylinder(round lake)}} = A h$, $0.0283 \text{ m}^3/\text{ft}^3$, 7.48 gal./ft^3 , 5280 ft./mile

ANSWERS: (a) 6 mi. or 31,680 ft., (b) $3.152 \times 10^9 \text{ ft}^2$, (c) $V = 9.456 \times 10^9 \text{ ft}^3$, (d) $267.6 \times 10^6 \text{ m}^3$, (e) $71 \times 10^9 \text{ gal}$.

COMMENT: Thus, last statement in article is TRUE.

Because water is essential to life, the discovery offers an exciting new place to search for life-forms beyond Earth. Italian scientists working on the European Space Agency's Mars Express mission announced on Wednesday that a **(((12-mile-wide underground liquid pool)))** — not just the **momentary damp spots seen in the past** — had been detected by radar measurements near the Martian south pole. "Water is there," Enrico Flamini, the former chief scientist of the Italian Space Agency who oversaw the research, said during a news conference. **"It is liquid, and it's salty,** and it's in contact with rocks," he added. "There are **all the ingredients for thinking that life can be there,** or can be maintained there if life once existed on Mars." ***The body of water appears similar to underground lakes found on Earth in Greenland and Antarctica. On Earth, microbial life persists down in the dark, frigid waters of one such lake. The ice on Mars would also shield the Martian lake from the damaging radiation that bombards the planet's surface.*** Jonathan Lunine, director of the Center for Astrophysics and Planetary Science at Cornell University, who was not involved with the research, said the finding transforms Mars from a dusty planet to **yet another "ocean world" in the solar system.** Dr. Lunine said, or years, "follow the water" has been the mantra of NASA and indeed humanity's search for life somewhere else. Without water, there is no life as we know it. In recent years, that has led the space agency to contemplate robot probes to the moons of Jupiter and Saturn, like Europa or Enceladus, where it is now known that salty oceans exist underneath thin shells of ice and where imaginative astrobiologists can envision microbes or more complex creatures. Since humans could see through telescopes across space, Mars has been the favorite abode of imaginary life, the backyard just over the fence where the astronomer Percival Lowell imagined he could see canals and even cities webbing the orange globe. In the final evenings of this month, the planet looms like a red lantern in the East, just 35,784,871 miles from Earth — the closest it has been in 15 years. Those early science fiction visions were dashed when the first spacecraft photos of the planet revealed a dry, cratered and lifeless-looking surface — a seemingly dead planet. In the history of Mars exploration ever since, the more we learn, the more we think it could have had a watery, perhaps life-sustaining past. The surface is scored by old gorges, canyons, beaches, ocean basins and giant volcanoes, whose eruptions could have kept things riled up on the planet. Where this water went and how, taking most of Mars's atmosphere with it, is one of the great and ominous environmental mysteries of our time. If life did arise from those early, cozy conditions, it could have moved underground as the surface cooled and dried. And if Mars was once flush with liquid, was it also flush with life? If astronauts ever crunch across the red sands, will they also be crunching over fossils of microbes? The current findings, however, "cannot say anything more," Dr. Flamini said. "We may guess about what are the conditions and if the conditions are favorable." Roberto Orosei, a co-investigator on the radar instrument and lead author of the **paper published on Wednesday** in the journal Science, said the scientists could not measure the thickness of the lake, but that it had to be at least a yard or so thick for the radar pulses to bounce back. He said a **back-of-the-envelope calculation indicated (((several hundred million cubic meters of water. That's tens of billions of gallons.)))**