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Water on the Moon has Major Implications for Space Exploration

The discovery of large quantities of water on the moon will have very significant implications for human space exploration, according to space expert Chris Welch. The findings by NASA, which have been hitting the headlines recently, were reportedly made after researchers examined data from three separate missions to the moon.

"Scientists thought they knew fairly accurately what the surface of the moon was like, and these results show that they didn't — or at least not completely," Welch said. "Finding so much more water could make living on the moon much easier in the future. Water is very heavy, and to have to launch it into space would be difficult and expensive.

Current thinking is that the water comes from particles in the solar wind, which is emitted by and streams away from the sun continuously, Welch, winner of the 2009 Sir Arthur Clarke Award for Achievement in Space Education, explained. The wind strikes the soil on the surface of the moon, which has no magnetic field or atmosphere to protect it, and stimulates chemical reactions in which oxygen atoms in the soil combine with hydrogen nuclei to form water (H2O) and hydroxyl (HO) molecules, he said.

"The water is thought to exist as a very fine film covering the particles of the lunar soil, or as groups of molecules, not as a liquid," Welch explained. "You couldn't drink it in its current form but, if extracted, then you certainly could. It has been suggested that one cubic meter of soil might provide one liter of water."

Earlier estimates suggested that there could be more than 300 million tons of water ice on the moon, and these new results suggest that it could be even more, Welch said. The water is not in the form as we know it on Earth. "The water is on the main lunar surface which is slightly 'damp' soil and rocks," Welch said. "These are still much dryer than any on Earth, though. At the poles of the moon, it is thought that water ice may exist in craters that have been in shadow for millions of years and which act as 'cold traps' for water vapor that might arrive either from cometary impacts or, now, from the rest of the surface."

While groundbreaking, Welch does not believe the new findings show there is or could once have been life on the moon. He believes further research is needed. "There need to be more detailed science missions, preferably with astronauts landing on the moon, to analyze the soil in space. On October 9, 2009, NASA LCROSS spacecraft is due to carry out two impacts on polar craters to see if it can throw up evidence of water ice."



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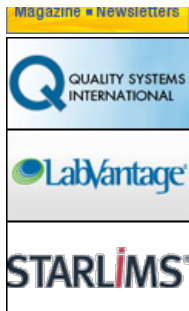
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