

Re: On the Subject of Ice

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The quoted passage below, from a NASA website, explains how ice exists on the Moon.

"The Moon has no atmosphere, any substance on the lunar surface is exposed directly to vacuum. For water ice, this means it will rapidly sublime directly into water vapor and escape into space, as the Moon's low gravity cannot hold gas for any appreciable time. Over the course of a lunar day (~29 Earth days), all regions of the Moon are exposed to sunlight, and the temperature on the Moon in direct sunlight reaches about 395 K (395 Kelvin, which is equal to about 250 degrees above zero F). So any ice exposed to sunlight for even a short time would be lost. The only possible way for ice to exist on the Moon would be in a permanently shadowed area."

"The Clementine imaging experiment showed that such permanently shadowed areas do exist in the bottom of deep craters near the Moon's south pole. In fact, it appears that approximately 6000 to 15,000 square kilometers (2300 to 5800 square miles) of area around the south pole is permanently shadowed. The permanently shadowed area near the north pole appears on Clementine images to be considerably less, but the Lunar Prospector results show a much larger water-bearing area at the north pole. Much of the area around the south pole is within the South Pole-Aitken Basin (shown at left in blue on a lunar topography image), a giant impact crater 2500 km (1550 miles) in diameter and 12 km deep at its lowest point. Many smaller craters exist on the floor of this basin. Since they are down in this basin, the floors of many of these craters are never exposed to sunlight. Within these craters the temperatures would never rise above about 100 K (280 degrees below zero F) (2). Any water ice at the bottom of the crater could probably exist for billions of years at these temperatures."

Thought it might help.

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