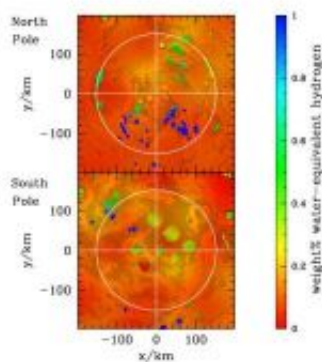


# Moon's polar craters could be the place to find lunar ice, scientists report

December 18 2008

---



A map showing the north and south polar regions of the moon. The dark blue shaded areas represent the highest concentrations of hydrogen. Credit: Dr. Vincent Eke, Durham University/NASA

Scientists have discovered where they believe would be the best place to find ice on the moon.

Astrophysicists, led by an expert at Durham University, say if frozen water exists then it is most likely to be found near to the moon's poles in craters that are permanently shaded from the sun.

Their findings are based on a new computer analysis of data from the Lunar Prospector, a space probe sent to the moon in 1998 by NASA. The researchers showed that hydrogen on the moon is concentrated into

polar craters where temperatures are colder than minus 170 degrees Celsius.

Hydrogen, together with the oxygen that is abundant within moon rock, is a key element in making water.

If ice is present in the craters then the researchers say it could potentially provide a water source for the eventual establishment of a manned base on the moon. A moon base could be used as a platform for exploration into the further reaches of our solar system.

The findings are published in the *International Journal of Solar System Studies, Icarus*.

They show that if the hydrogen is present as water ice, then the average concentration in some craters corresponds to ten grams of ice in each kilogram of moon rock.

However the researchers say that instead of being water ice, hydrogen may be present in the form of protons fired from the sun into the dusty lunar surface.

Dr Vincent Eke, in the Institute for Computational Cosmology, at Durham University, said: "This research applies a newly developed technique to data from the Lunar Prospector mission to show that hydrogen is actually concentrated into the permanently shaded polar craters.

"Water ice should be stable for billions of years on the moon provided that it receives no sunlight.

"If the hydrogen is present as water ice then our results imply that the top metre of the moon holds about enough water to fill up Kielder

Water."

Kielder Water, in Northumberland, UK, holds 200,000 million litres of water, making it the largest UK manmade reservoir in Northern Europe.

The research may be of immediate use in lunar exploration. Dr Richard Elphic, in the Planetary Systems Branch, NASA Ames Research Center, said: "These results will help NASA's soon-to-be launched Lunar Crater Observation and Sensing Satellite (LCROSS) and Lunar Reconnaissance Orbiter (LRO) missions.

"For example, LCROSS aims to liberate water by impacting into permanently shadowed polar terrain where ice may exist, and our improved maps of hydrogen abundance can help LCROSS select a promising impact site.

"These maps will also help focus LRO's search for possible polar ice by identifying hydrogen-rich locales".

Source: Durham University

Citation: Moon's polar craters could be the place to find lunar ice, scientists report (2008, December 18) retrieved 18 April 2024 from <https://phys.org/news/2008-12-moon-polar-craters-lunar-ice.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.