help fully quantify the amount of water that can penetrate the slab.

Several aspects regarding water in subduction zones remain to be fully understood. These include, for example, the feasibility of dehydration-induced brittle deformation to explain even the deepest (300–660 km) earthquakes, and the amount of water that is ultimately retained in the slab and subducted into the deep mantle. Answering these questions requires an accurate quantification of the water budget of the subducting slab, a step we are much closer to achieving now that Faccenda and colleagues[5] have helped clarify the mechanism of slab hydration. ❐

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PLANETARY SCIENCE

# Wet Moon dry Earth

As the target of as many as four unmanned missions during the past two years, the Moon finds itself back in the limelight after a long hiatus. Much of the present interest seems to have been sparked by the desire to find water on the lunar surface. The presence of water on the Moon has long been predicted, but samples returned by the early lunar missions failed to show any evidence. Recent analysis of lunar volcanic glasses, and calculations based on these data, suggest that the Moon's interior could have as much water as is found inside Earth (*Nature* **454,** 192–195; 2008 and *Science* doi:10.1126/science.1181471; 2009). Lunar surface water, however, was still elusive.

An important objective of the Chandrayaan-1 mission — India's maiden foray into lunar exploration — was to detect water at the Moon's surface. An analysis of data collected by the Moon Mineralogy Mapper ($M^3$), a NASA instrument that the spacecraft hosts, now provides what seems to be unambiguous evidence for water or hydroxyl ions on the lunar surface (*Science* doi:10.1126/science.1178658; 2009). Soils containing these substances preferentially absorb electromagnetic radiation of a specific wavelength: $M^3$ picked up such a signal over a considerable area of the Moon. This finding has been confirmed by two other studies that used observations made by other spacecraft (*Science* doi:10.1126/science.1179788 and doi:10.1126/science.1178105; 2009).

It seems that the water or hydroxyl ions are confined to the uppermost few millimetres of the surface. Furthermore, the signal is stronger at higher latitudes and in regions where deeper material has been excavated and piled up around young impact craters. The source of the water/hydroxyl ions remains unclear, but the interaction of hydrogen ions supplied by solar wind with oxygen-rich soil surfaces is one possibility. Alternatively, water-bearing minerals may be part of the Moon's make-up, which somehow escaped sampling by early missions.


THE HINDU, CHENNAI

Chandrayaan-1 can rightfully declare its mission as accomplished, notwithstanding the fact that its lifespan was cut short by a technical glitch. Media reports of the premature expiration of the spacecraft were quickly replaced by paeans to the genius of Indian science and technology. A nation that hardly makes any ripples in either the Olympics or the Human Development Index is understandably eager to highlight its accomplishments.

Those Indians who have more than pride to worry about, however, may be justifiably perplexed with the hullabaloo surrounding the discovery of water on the Moon. Their predicament is aptly portrayed by the cartoon shown here. Whether water on the Moon could be used to support further exploration or settlement — an idea that has received much attention — is largely irrelevant to the large number of Indians (mostly women) who have to trudge for miles every day to fetch water for domestic purposes.

When our euphoria about a wet Moon begins to evaporate, it would perhaps be appropriate to ponder about how scientific and technological advances — as exemplified by Chandrayaan-1 and $M^3$ — could be used to make a difference in the lives of those for whom the Earth is still a rather dry planet.

NINAD BONDRE