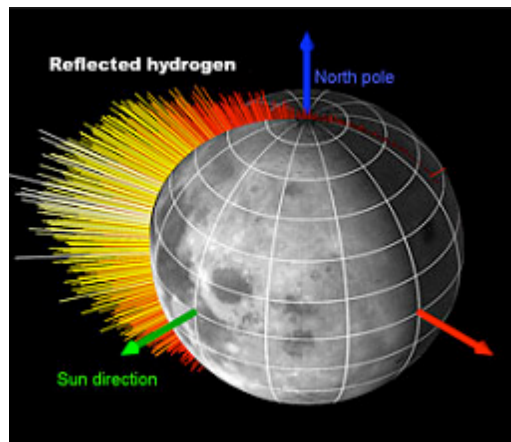


Scientists find out how moon makes own water: report

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Courtesy European Space Agency
and World Science staff

Moon, like a big sponge, absorbs electrically charged particles from the Sun, which in turn combine with oxygen in some lunar dust to make water, scientists say.

They add that the finding—made using the Indian Chandrayaan-1 lunar orbiter—also suggests a new way to make images of the Moon and other airless Solar System bodies.



Hydrogen flow on the moon as measured by the Chandrayaan-1 lunar orbiter's Sub-keV Atom Reflecting Analyzer. (Courtesy ESA)

Researchers reported only last month that the moon has either water or a similar molecule, called hydroxyl.

The lunar surface is a loose collection of irregular dust grains, called regolith. Incoming particles are probably trapped in the spaces between the grains and absorbed, according to scientists.

When this happens to protons—electrically charged particles that lie at the cores of atoms—the protons are expected to combine with the oxygen in the regolith to produce hydroxyl and water, the investigators explain.

The research group, Stas Barabash of the Swedish Institute of Space Physics and colleagues, reported the findings in a paper to be published in the journal *Planetary and Space Science*.

The results confirm that protons are being absorbed by the regolith, but also highlight a mystery, Barabash said: not every proton is absorbed. One in five of them rebounds into space and joins with an electron, another subatomic particle, to become a hydrogen atom. “We didn’t expect to see this at all,” said Barabash, the European principal investigator for the orbiter’s Sub-keV Atom Reflecting Analyzer, an instrument used in the research.

The discovery paves the way for a new type of image to be made, he added. The hydrogen shoots away with speeds about as fast as a speeding train and escapes the moon. Hydrogen is also electrically neutral, and is not diverted by the magnetic fields in space, so the atoms fly in straight lines, just like particles of light.

In principle, each atom can be traced back to its origin and an image of the surface can be made,

Barabash predicted. The areas that emit most hydrogen would appear brightest.

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