

## Moon rocks are surprisingly wet

THE moon is not the shrivelled prune of a satellite we once thought. Beneath its dusty surface there is water - quite a lot of it.

Alberto Saal of Brown University in Providence, Rhode Island, and colleagues analysed 10 rocks brought back by the Apollo 17 mission and discovered that they contain water at concentrations of between 615 and 1410 parts per million. That's comparable to the 500 to 1000 parts per million of water in the Earth's upper mantle, the layer of near-molten rock just beneath the crust (*Science*, DOI: 10.1126/science.1204626).

The discovery does not mean the moon is swollen with water like a ripe melon, however. The liquid would actually be hard to extract.

But the notion that moon rocks hold any water at all is a surprise because it contradicts the prevailing ideas about how the moon formed.

Current thinking is that some 4 billion years ago, a Mars-sized object smashed into the proto-Earth, knocking off a chunk that eventually formed the moon. But the collision should have vapourised any water in the chunk.

"If the whole moon has the amount of water equivalent to what we analysed, then the giant impact theory is in a little trouble," says Saal. "How the water got there is a question people need to work on."



## Extreme weather is forecast to continue

THE El Niño Southern Oscillation (ENSO) - a climate mechanism that brings extreme weather - is likely to continue in a warmer world. That could be good news, though.

At the moment the Pacific Ocean oscillates between two extreme states, El Niño and La Niña, every few years. Floods and droughts follow both; the recent floods in Australia were a result of La Niña. There have been fears that as global temperatures rise, the ENSO may shut down and send the Pacific into a permanent El Niño. Without La Niña's upwelling

of cold water, warm water would cover most of the Pacific, heating the atmosphere even more.

But Ros Rickaby of the University of Oxford thinks this scenario is unlikely. She studied plankton fossils from the Pliocene (4.5 to 3 million years ago), during which global temperature was 3°C higher than now.

The plankton's tiny calcium carbonate shells record the temperature they grew in. Rickaby found that the fossils had experienced a wider range of temperatures than seasonal

change alone would explain. There must have been an extra source of variation, which she thinks was the ENSO (*Paleoceanography*, DOI: 10.1029/2010pa002097).

Pedro DiNezio of the National Oceanic and Atmospheric Administration in Miami, Florida, has produced models that also suggest the ENSO will continue in future, but warns that the Pliocene may have little to tell us about the present, because the climate is now changing much faster than it did then.

## Sounding out cancer cells

A DEVICE that filters cancer cells from human blood using sound could help to identify tumour cells that have spread.

Finding tumour cells in the blood indicates a cancer has metastasised - but the molecular markers that are used to identify the cells can modify them and make them unsuitable for study to confirm metastasis.

So Itziar González at the Institute for Acoustics in Madrid, Spain, and colleagues developed an alternative: a tiny vibrating plastic chamber through which a blood sample flows. The vibrations create a standing wave that deflects cells in the blood to a different degree depending on their size. Tumour cells are often larger than blood cells and so collect in a different region of the device. The process does not alter the cells.

David Beebe at the University of Wisconsin, Madison, thinks the technique has potential. "Not labelling the cells is an advantage" for cultivating and studying them, he says.

González presented the work at the International Conference on Microtechnologies in Medicine and Biology in Lucerne, Switzerland, last month.



HOLGER WINKLER/CORBIS

## On a diet? Try mind over milkshake

IF YOU want to lose weight, convince yourself that everything you eat is highly calorific. It could lower your levels of a hunger hormone, potentially suppressing your appetite.

Alia Crum at Yale University and her colleagues gave 46 healthy volunteers the same 380-calorie milkshake but were told it was either a sensible, low-calorie choice or an indulgent, high-calorie one. The team also measured levels of ghrelin - a hormone released by the stomach when we are hungry - before and after participants drank the shake.

Ghrelin levels have been shown to

spike half an hour before mealtimes and return to normal after eating.

Volunteers who thought they had indulged showed significantly greater drops in ghrelin levels than those who thought they had consumed less. The authors suggest that merely thinking that one has eaten something unhealthy can quell hunger pangs and perhaps help curb overeating (*Health Psychology*, DOI: 10.1037/a0023467).

The study shows that food labels can affect consumption in unexpected ways, says David Cummings, an endocrinologist at the University of Washington in Seattle.