

Neutrinos for Geophysics

Walter Winter of the Institute for Advanced Study in Princeton in the US has proposed using a beam of neutrinos to measure the density of the Earth's core.

He says that neutrinos could provide information about the Earth that is not available with other techniques.

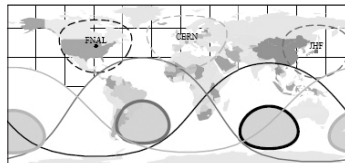
According to Physics Web.org, although measurements of the seismic waves produced by earthquakes can be used to reconstruct a profile of the Earth's interior, they provide only indirect information.

Neutrinos come in three flavours—electron, muon and tau neutrino. They are

also electrically neutral and only interact weakly with other particles, which means that they can pass through thousands of kilometres of matter without being absorbed.

However, neutrinos can change flavour or "oscillate" as they pass through matter with, for instance, electron neutrinos oscillating into muon neutrinos and so on. Since the amount of oscillation depends on the electron density in the matter, and since the electron density is directly related to the overall matter density, it should be possible to determine the matter density of the Earth by making accurate measurements of the oscillations.

Winter proposes sending a beam of neutrinos from an accelerator tens of thousands of kilometres through the Earth to a detector on the other side of the globe. In principle, the beam would travel from a proposed "neutrino factory" in the northern hemisphere to a 50,000 ton iron detector in the southern hemisphere. For example, a beam could be sent from CERN in Switzerland through the inner core of the Earth to a detector in New Zealand.



Positions of three of the major potential neutrino factory laboratories, (typical) L = 3,000 km detector sites (dashed curves), as well as potential detector sites with outer core crossing baselines (below thin solid curves), and inner core crossing baselines (with-in thick solid curves).

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Mars Pictures Reveal Frozen Sea

Age, frozen sea lies just below the surface of Mars, a team of European scientists has announced, BBC News website reported.

Their assessment is based on pictures of the planet's near-equatorial Elysium region that show plated and rutted features across an area 800 by 900km.

The team thinks a catastrophic event flooded the landscape five million years ago and then froze

out. Large reserves of water-ice are known to be held at the poles on Mars but if this discovery is confirmed by follow-up observations, it would be a first for a region at such a low latitude.

"It's been predicted for a long time that you should find water close to the surface of Mars near the equator," Jan-Peter Muller, from University College London, UK, said.

The interpretation is based on images taken by the High Resolution Stereo Camera on Europe's Mars Express spacecraft. These show extensive fields of large, platy features - reminiscent of the fractured ice floes found in polar regions on Earth.

Finding exposed ice at the equator would be unlikely. Very low pressures on the planet would lead to sublimation - the ice would erode over time straight to water vapor.

Sars Bug Beaten

Scientists say the lung disease Sars has been beaten, ananova.com said.

After passing from wild animals in China in 2002, it affected more than 8,000 people and killed

774. Since then, ways of detecting the cold-like virus have been found reports the Mirror.

Scientist do not think the disease will return to infect humans unless

there is an unlucky escape from a lab or the virus mutates into an entirely new form.

Dr. Kathryn Holmes of the University of Colorado said: "If an animal strain mutated again, we could get an outbreak. But so far the strain is not being harboured in animals. I think it's a triumph of modern science and medicine that this has happened so quickly."

Slimmers Told to Drink Milk

Italian researchers are urging overweight kids to drink more milk after they found it had a slimming effect, ananova.com said.

A study carried out by scientists from the Italian Research Institute found that children who do not drink much milk have a higher percentage of body fat than children who do. Scientist Dr. Gianvincenzo Barba, who carried out the study on 1,000 primary school children, said, "The study found an inverse correlation between milk consumption and obesity. The more milk you drink, the slimmer you are."

The correlation results from the high calcium content in milk, which stimulates fat burning and at the same time

slows the growth of fat cells.

Barba added the same applies to adults, "Recent studies carried out on adults have also proved the positive effects of a calcium rich diet."

He added the results of the study contrasted greatly to the behavior of fat-conscious adults who avoid milk and cheese products in order to lose weight.

The scientist said by doing this not only were they preventing the burning of fat but also the important intake of calcium.

"The results of the study have provided an important starting point for further research into the prevention of obesity especially in infants," said Barba.

Yawning, a Group Activity

Researchers say that if you see someone yawning, or read the word, you are likely to do it too. If someone yawns there is a 60 per cent chance others around will copy them reports The Sun.

Dr. Martin Schurmann from Finland tested a group of volunteers by showing them photos of stars including Michael Schumacher yawning and scanned their brains at the same time.

The results proved yawning is a "synchronised group activity"—a herd instinct the same as animals running off together when in danger or a flock of birds taking

flight.

Experts had believed that copycat yawning was just imitation. But the experts found the areas of the brain used for mimicry were not employed. They also found that most people only need to see the word "yawning" to set them off.

Schurmann said, "Such synchronisation could be essential for species survival and works without understanding. This is the same as when a flock of birds rises to the air as soon as the first bird does when it notices a predator."

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