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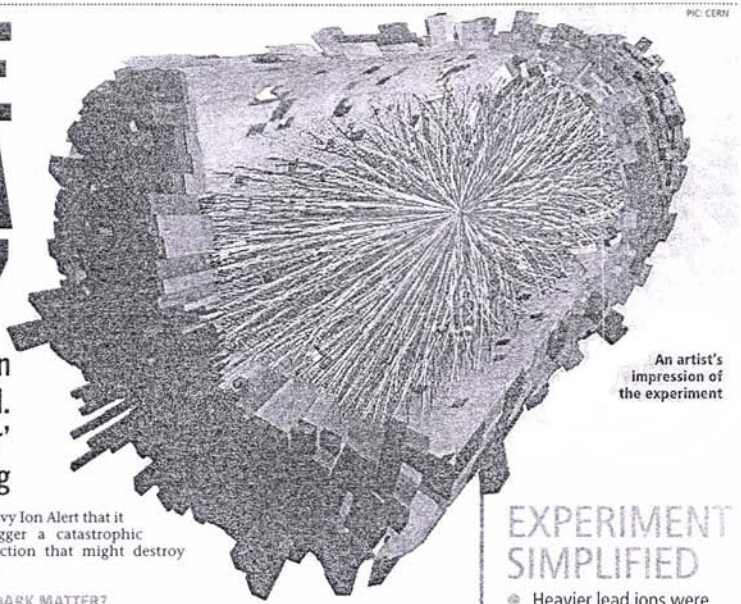
NEW BROWSER COMBINES WEB SEARCH WITH FACEBOOK

A new internet browser that requires a Facebook log-in has been unveiled, aimed squarely at social networking users. Called RockMelt, it has been set up by Marc Andreessen, the founder of Netscape. Based on Google's Chromium software, Rockmelt is designed to let users share everything they do with the friends on Facebook and Twitter. Netscape claims browsing information of users will not be sold to advertisers. —IANS

GOD MACHINE CREATES A 'MINI BIG BANG'

Scientists have managed to recreate the scene when the world came into being by firing lead ions at CERN. They are now going to study the hot soup of 'matter' that came out of the lab-created Big Bang

PIC: CERN



An artist's impression of the experiment

LONDON: Researchers at the Large Hadron Collider (LHC) have on November 8 recreated the Big Bang on a miniature scale. *The Telegraph* reports that the collisions were produced by firing lead ions — atoms with their electrons removed — at incredible speeds in opposite directions around the LHC's underground tunnel at CERN, the European Organisation for Nuclear Research, near Geneva. The heavyweight particle collisions follow seven months of earlier experiments crashing protons — which are 200 times lighter than lead ions — at near-light speeds.

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The reaction created temperatures a million times hotter than the centre of the Sun, which have not been reached since the first billionths of a second following the Big Bang. This was expected to cause atomic particles such as protons and neutrons to melt, producing a 'soup' of matter in a state previously unseen on Earth.

Scientists will now study the particles in the hope of discovering what holds atoms together and gives them their mass. "We are thrilled with the achievement. The collisions generated mini Big Bangs and the highest temperatures and densities ever achieved in an experiment," Dr David Evans, of Birmingham University, said.

"This process took place in a safe, controlled environment generating incredibly hot and dense subatomic fireballs with temperatures of over ten trillion degrees — a million times hotter than the centre of the Sun," he added.

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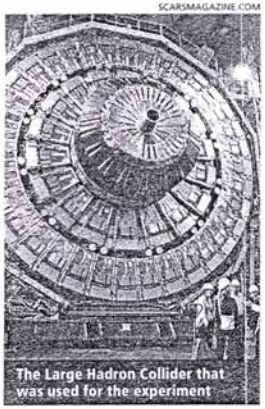

The Large Hadron Collider that was used for the experiment

"At these temperatures even protons and neutrons, which make up the nuclei of atoms, melt resulting in a hot dense soup of quarks and gluons known as a Quark-Gluon Plasma." Evans said. "By studying this plasma, physicists hope to learn more about the Strong Force, one of the four fundamental forces of nature," he added.

The latest experiment at CERN went ahead despite warnings by a group called Heavy Ion Alert that it could trigger a catastrophic chain reaction that might destroy the Earth.

WHAT'S DARK MATTER?

Dark matter is a form of matter that is undetectable by its emitted electromagnetic radiation, but whose presence can be inferred from gravitational effects on visible matter.

Its existence has been hypothesised to account for recently discovered discrepancies between measurements of the mass of the universe by gravitational methods, and measurements based on visible objects (galaxies, gas, dust).

According to observations of structures larger than galaxies, and Big Bang cosmology, dark matter accounts for 23% of the total mass-energy of the observable universe, while the ordinary matter accounts for only 4.6% (the remainder is attributed to dark energy).

HIGGS BOSON OR GOD PARTICLE

A boson is a sub-atomic particle. Atomic particles are protons, neutrons, and electrons. They are divisible into quarks, leptons, and bosons. But scientists aren't sure how these super tiny particles gained mass. They say that another boson — named after Peter Higgs, who came up with the idea — imparts mass on other bosons, quarks and leptons. It is one of the minutest building blocks of the Universe.

WORLD'S BIGGEST REFRIGERATOR

The LHC, the world's largest and highest-energy particle accelerator, is contained in a circular tunnel, with a circumference of 27 km, at a depth ranging from 50 to 175 metres underground.

The collider tunnel contains two adjacent parallel beam pipes that intersect at four points, each containing a proton beam, which travel in opposite directions around the ring.

Some 1,232 dipole magnets keep the beams on their circular path, while an additional 392 quadrupole magnets are used to keep the beams focused, to maximise the chances of interaction between the particles in the four intersection points, where the two beams will cross.

In total, over 1,600 superconducting magnets are installed, with most weighing over 27 tonnes. Approximately, 96 tonnes of liquid helium is needed to keep the magnets at their operating temperature of 1.9 K (-271.25 °C), making the LHC the largest cryogenic facility in the world at liquid helium temperature. 1K equals -272.15°C.

EXPERIMENT SIMPLIFIED

- Heavier lead ions were used instead of protons
- These ions were fired at each other from opposite directions at high speed
- The collision created temperatures a million times hotter than the Sun's core. This temperature, scientists say, hasn't been reached since the first billionths of a second after the Big Bang
- Protons and neutrons melt at these temperatures, creating Quark-Gluon Plasma — a hot, dense soup of quarks and gluons. This is expected to give physicists some idea about the Strong Force, one of the four fundamental forces of nature