Big-bang project sparks cosmic response

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Read more about grid computing Scientists in Switzerland are building a machine to test the big-bang theory of how the universe began. But first they have to construct a computer network that can handle the volumes of data the device will produce. The new, more powerful particle accelerator, known as the Large Hadron Collider, is being built at CERN, the same Swiss laboratory where Tim Berners-Lee developed the World Wide Web. With such a tool, scientists say that they will either be able to produce the same particles thought to have existed when the universe was formed, or they will have proved that such particles just don't exist. But before they can test their theory, the scientists will need a computer network capable of processing and storing the massive amounts of data that will begin spewing from the collider once it starts smashing particles together in 2007. As a result, researchers at CERN created Openlab, a grid computing network designed to test the type of equipment that is likely to be standard by the middle to end of this decade when the project really gets under way. In grid computing, large numbers of desktop PCs and modestly sized servers are linked across a network in a way that allows them to function as a single, virtual supercomputer. "The hope is that we, together with partners, solve whatever bugs there are," said Francois Grey, development manager for the Openlab effort. Grey notes that the particle accelerator is likely to be up…more detail

You're always just a typo away from the Large Hardon Collider

CERN, Europe's nuclear research organization, operates the Large Hadron Collider (or LHC, for short) — the largest particle accelerator in the world. Inside this almost 17-mile ring of tubes and superconducting magnets, beams of high-energy particles collide at nearly the speed of light. The LHC is also, apparently, a "hardon" collider, according to certain reaches of the internet — including CERN's own site. That's right, CERN has made the dreaded hardon typo. Writer Anne Thériault recently pointed out a few on Twitter: I repeated Thériault's brilliant experiment — searching site:cern.ch, site:cds.cern.ch, and site:https://home.cern for "large hardon collider" "hardon" and "large…... [read more]

Govt brews national cloud for science

Australian scientists will have access to a multi-million dollar national cloud network and $50 million towards a petabyte supercomputer and data centre within three to five years under slated improvements to the nation's grid networks. The upgrades will make it easier for scientists working in fields such as cancer research, space exploration and mechanical engineering to access the nation-wide computer networks without requiring complex IT skills, or in most cases, without paying a cent. Grid networks provide unparalleled compute capacity critical to processing the huge data streams generated by cutting-edge scientific research. Such research would often be stonewalled without access…... [read more]

Planetary Protection: Contamination Debate Still Simmers

On Sept. 15, 2017, NASA's Cassini spacecraft will take a suicide plunge into Saturn to avoid contaminating the ringed planet's potentially habitable moons, Titan and Enceladus. Cassini's fate is tied to the issue of planetary protection, which refers to the measures scientists and engineers take to minimize that chances that life-forms from Earth make it to other worlds. And with NASA's Mars 2020 rover planning to cache samples to one day return to Earth's labs, planetary protection also means making sure that our own world is safe from contamination by possible alien life. Planetary protection was the first item on…... [read more]

The Higgs Boson: A Not-So-Godlike Particle

Paul Sutter is an astrophysicist at The Ohio State University and the chief scientist at COSI science center. Sutter is also host of Ask a Spaceman, RealSpace and COSI Science Now. He contributed this article to Space.com's Expert Voices: Op-Ed & Insights. Let's be perfectly honest. The Higgs boson and its role in the universe are not the easiest things to explain. It doesn't help that the Higgs

has the horrible nickname of "the God Particle" and is often described as being "responsible for mass in the universe" or something like that. The Higgs boson is indeed an important part…... [read more]

The Large Hadron Collider Is Back in Business

The Large Hadron Collider Is Back in Business The giant particle accelerator is all done with its repairs and will soon begin smashing protons together again. Most Popular For the past several months, the Large Hadron Collider in Switzerland has been undergoing maintenance. Equipment has been tested and upgraded, parts have been replaced, and this weekend, the giant machine will finally be switched back on to begin collecting data again. The LHC is the largest machine in the world, which means keeping it operational is a herculean task. Millions of components have to work seamlessly with one another, and if…... [read more]

Boffins gently wake the Large Hadron Collider from annual hibernation

CERN says the restart process for the Large Hadron Collider is complete and the proton-smasher is ready to start its 2017 science program. Alas, Vulture South's favourite mental image of an Igor saying "Yeth, marthter" and hauling on suitably Big Red Switch doesn't match reality: the restart process is a carefully-managed power-up of each part of the accelerator chain "until it gets to the final, biggest machine", CERN explains (so we'll just think operations leader Rende Steerenberg as "Igor in chief" and move on). The LHC layoff for maintenance and upgrades included a "massive" cable removal project, replacing a superconducting…... [read more]

A Cosmic-Ray Hunter Closes in on Super-Energetic Particles

On April 25, at 10:50 am local time, a white helium balloon ascended from Wanaka, New Zealand, and lifted Angela Olinto's hopes into the stratosphere. The football stadium-size NASA balloon, now floating 20 miles above the Earth, carries a one-ton detector that Olinto helped design and see off the ground. Every moonless night for the next few months, it will peer out at the dark curve of the Earth, hunting for the fluorescent streaks of mystery particles called "ultrahigh-energy cosmic rays" crashing into the sky. The Extreme Universe Space Observatory Super Pressure Balloon (EUSO-SPB) experiment will be the first ever…... [read more]

Oddities start to emerge from deeper analyses of LHC data

The Large Hadron Collider has generated a staggering amount of data in its years of operation; it's enough data that we'll be analyzing it for years after the collider shuts down. In the meantime, priority has gone to searches for big-ticket items like the Higgs boson (tick) and dark matter particles (MIA). But with time, some other analyses have managed to get done, and they're beginning to turn up unexpected results. Quark-gluon plasma In the current Universe, quarks are held together by gluons to form particles like protons and neutrons. In the first fractions of a second after the Big Bang,…... [read more]

Colliders, containers, dark matter: The CERN atom smashers careful cloud revolution

CERN made headlines with the discovery by physicists in 2012 of the Higgs boson, paving the way to a breakthrough in our understanding of how fundamental particles interact. Central to this was the Large Hadron Collider - a 26km ring of interconnected magnets chilled to -271.3C straddling the Franco-Swiss border. The LHC is the world's largest and most powerful particle accelerator. But 2012 was notable for another reason: an overhaul of the IT infrastructure that CERN's army of physicists using LHC and four other accelerators depend on to run their experiments and crunch their data. In came OpenStack - then…... [read more]

The Hunt for the Very First Stars Is Taking Us to the Moon

By Jay Bennett Apr 10, 2017 From probing the Dark Ages of the universe to building a telescope on the moon, pinpointing the light of the first star will be no easy task. Jack Burns is interested in the Dark Ages of the universe. His primary research team—consisting of 22 scientists from CU, UCLA, NASA Goddard, Arizona State and more—wants to know how things began. Specifically, they are working to investigate the time when the universe's very first stars were born, a period that's clouded in mystery and darkness. And they are going to do it by launching a telescope…... [read more]

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