

Large Hadron Collider hiatus sets stage for more discovery (Update)

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A person stands in front of the huge ATLAS detector, one of six detectors that are part of the Large Hadron Collider near Geneva. Credit: Maximilien Brice, CERN

The world's largest and most powerful atom smasher goes into a 2-year hibernation in March, as engineers carry out a revamp to help it reach maximum energy levels that could lead to more stunning discoveries following the detection of the so-called "God particle."

With the reopening of its \$10 billion proton collider in early 2015, the stage will be set for observing more rare phenomena—and unlocking more mysteries, said James Gillies, chief spokesman for the European particle physics laboratory known as CERN.

The Large Hadron Collider under the Swiss-French border will operate

for two more months then shut down through 2014, allowing engineers to lay thousands more superconducting cables aimed at bringing the machine up to "full design energy," Gillies told The Associated Press on Friday.

Physicists at the European Center for Nuclear Research, known by its French acronym CERN, won't exactly be idle as the collider takes a break. There are still reams more data to sift through since the July discovery of a new subatomic particle called the Higgs boson—dubbed the "God particle—which promises a new realm of understanding of the universe.

For the next two months, the Large Hadron Collider will be smashing protons with lead ions, then undergo several weeks of testing before it shuts down. The collider launched in September 2008, but had to be switched off just nine days later when a badly soldered electrical splice overheated, causing extensive damage to the massive magnets and other parts of the collider some 300 feet (100 meters) below the ground.

It cost \$40 million to repair and improve the machine. Since its restart in November 2009, the collider has performed almost flawlessly and the power produced has been ramped up to ever-new record levels, creating a treasure trove of new data to sift through.



In this March 30 2010 file picture s cientist of the European Organization for Nuclear Research, CERN, react in the SMS experiment control room at their headquarter outside Geneva, Switzerland. The world's largest and most powerful atom smasher goes into a 2-year hibernation in March 2013 , aiming to reach maximum energy levels that may lead to more stunning discoveries after hunting down the so-called "God particle. But physicists at the European Center for Nuclear Research, known by its French acronym CERN, won't exactly be idle as the US \$10 billion proton collider goes on hiatus for maintenance and retooling -- in preparation for unlocking more mysteries. There are still reams more data to sift through since the July discovery of a new subatomic particle called a Higgs boson and promises a new realm of understanding in subatomic science. (AP Photo/Anja Niedringhaus)

But because of the 2008 accident, the collider could only run at an energy level far below what it was designed to do. To fix that, Gillies said, engineers over the next two years will install 10,000 redesigned superconducting cables that connect between the magnets. That will

vastly improve its capacity to simulate the moments after the Big Bang nearly 14 billion years ago.

"It will bring you more collisions. Which means that the more collisions you have, the more likely you are to see rare events," he said. "The Higgs particle was just one of many on the wish list that we'd like to find, so higher energy increases your discovery potential."

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