

Large Hadron Collider experiments to present latest results at Moriond conference

March 4 2013

Experiments at CERN's Large Hadron Collider (LHC) are set to present their latest results at the Moriond conference, which begins tomorrow in the Italian town of La Thuile, and runs until 16 March. Although all of the LHC experiments will present results, eyes will be on the ATLAS and CMS collaborations, which will give updates on the analyses of the new particle whose discovery was announced last July.

"Patience is the order of the day," said [CERN](#)'s research director, Sergio Bertolucci. "Everyone wants to know exactly what it is we've discovered, and that will come through a long and painstaking analysis. But the Higgs is just one part of a wide research programme at the LHC experiments, and there will be plenty of other interesting physics at Moriond."

The new particle was discovered by first eliminating a vast range of mass values where both theory and previous experiments suggested that the long-sought Higgs boson should be, and then seeing a growing signal in the region of 125 GeV. The work now at hand is to measure the properties and quantum numbers of the particle, to determine whether it is indeed the type of particle first postulated by Peter Higgs and others in 1964. If it is such a particle, it could complete the so-called [Standard Model of particle physics](#), which describes the [fundamental particles](#) that make up all the [visible matter](#) in the universe and the forces that act between them, with the exception of [gravity](#).

Part of the key to finding out what kind of particle has been discovered lies in precisely measuring the rates at which it decays into others.

ATLAS and CMS will present and update on these eagerly awaited results at Moriond. Both collaborations will report some analyses based on the full 2012 dataset, including results on decays to two [photons](#), Z, W or tau particles. The larger [datasets](#) going into the Moriond analyses will allow the signal strengths to be more precisely measured, providing more clarity about the nature of the new boson.

"Precise measurements may not at first sight seem as exciting as discovering a new particle," explained Bertolucci, "but it's there that we really learn things. For example a discrepancy with theoretical predictions for the signal strengths in any of the decay channels would be one of the strongest markers for new physics."

Complementing the studies of the new boson, ATLAS and CMS will present updated results on a range of searches for other new particles, such as heavier versions of known objects or supersymmetric particles. Another strand of results will be in precision measurements for a variety of Standard Model processes.

All told, there will be a plethora of new measurements and search results emerging from the LHC in the coming weeks.

More information: For more information about the expected results at the upcoming Moriond conference:

[www.quantumdiaries.org/2013/03 ... -news-for-next-week/](http://www.quantumdiaries.org/2013/03...-news-for-next-week/)

[www.quantumdiaries.org/2013/03 ... st-t-elle-imminente/](http://www.quantumdiaries.org/2013/03...-st-t-elle-imminente/)

Provided by CERN

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