"Higgs" boson may not open door to exotic realms

Robert Evans, Reuters

(Reuters) - A new elementary particle whose discovery was announced with fanfare to a waiting world in July may be just a little less exciting than scientists had hoped.

Reporting on a conference in Kyoto where the latest data from their Large Hadron Collider (LHC) was presented, scientists at the CERN European research center said on Thursday it seemed very likely that the particle was indeed the long-sought Higgs boson, which gives mass to matter.

But rather than an exotic beast opening the door to new realms of cosmology as some had hoped, the data increasingly suggests it is a "Standard Model Higgs" fitting into the current scientific concept of the universe, they asserted.

"It is still too early to tell, but the new particle looks like, sings like, and dances more and more like a Higgs boson," said Pauline Gagnon, a physicist on the LHC Atlas experiment, one of three which analyse the data.

Oliver Buchmueller, of the rival but parallel CMS experiment, told Reuters "the evidence for it being the Higgs gets stronger and stronger as we go along."

But there was still no sign of it being more unusual than originally predicted.

The prime task of the $10 billion LHC was to find the Higgs, without which the primeval chaos of flying particle debris after the Big Bang, 13.7 billion years ago, could not have formed into stars, planets and galaxies.

Existence of the particle was postulated in 1964 by British physicist Peter Higgs, who saw it filling a gap in the Standard Model, a blueprint of how the universe works at the fundamental level fully developed from the 1970s.

Scientists sought to track it from the 1980s and finally succeeded in spotting something like it two years after the LHC went into operation in 2010.

But they insisted they still had to establish its existence with what they call 5-sigma - or absolutely total - certainty.

They had also hoped their search would find at least some evidence for more out-of-the-box concepts such as super-symmetry, dark matter and dark energy - beyond the Standard Model and part of what they call fall "New Physics."

Super-symmetry could theoretically account for the dark matter believed to make up nearly 25 percent of the known universe - of which no more than five percent is

visible. But no sign of that has come so far, the reports from Kyoto say.

However, the CERN scientists have not given up hope that something more exotic might emerge. For the Higgs-like particle to presage super-symmetry, it would have to come in at least five different varieties.

"The challenge is to measure all the properties of the new particle in detail. It will take time to establish a comprehensive understanding of its true underlying nature," said Buchmueller, who is working on super-symmetry.

Scientists are now looking to the years after 2014 when the power of the circular collider is doubled, and even beyond to the construction [1] of a yet only conceptual huge linear collider, possibly in Japan [2].

(Editing by Matthew Tostevin)

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