

"Long before it's in the papers"

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Additional evidence of elusive “God particle” reported

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Courtesy of Michigan State University
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After 40 years of searching, physicists say they have turned up new evidence for the existence of the elusive Higgs boson.

The Higgs boson is a hypothetical particle thought responsible for giving mass to matter. It's also a critical but still unproven component of the long-standing Standard Model of particle physics, a working theory most physicists rely on to explain the makeup of the universe.

Michigan State University physicist Wade Fisher presented the new findings March 7 at a physics conference in La Thuile, Italy.

If a Higgs boson is created in a high-energy particle collision, it's expected to break down into lighter, more stable particles before even the world's best detectors can snap a picture of it. To find one, physicists retraced the path of these secondary particles and ruled out processes that mimic its signal.

“We see a distinct Higgs-like signature that cannot be easily explained without the presence of something new,” said Fisher, who coordinates scientific teams that go by the names Collider Detector at Fermilab and DZero, at the Department of Energy's Fermi National Accelerator Laboratory. “If what we're seeing really is the Higgs boson, it will be a major milestone for the world physics community and will place the keystone in the most successful particle physics theory in history.”

The results, which have been collected over several years at Fermilab, are similar to those found by teams working at the Large Hadron Collider at CERN, the European Organization for Nuclear Research. But even though the results are close, scientists are not quite ready to claim a definitive discovery, said Dmitri Denisov, a DZero spokesperson and physicist at Fermilab.

“There is still much work ahead before the scientific community can say for sure whether the Higgs boson exists,” Denisov said. “Based on these exciting hints, we are working as quickly as possible to further improve our analysis methods and squeeze the last ounce out of our data.”

The Collider Detector at Fermilab is an international experiment of 430 physicists from 58 institutions in 15 countries. DZero is an international experiment conducted by 446 physicists from 82 institutions in 18 countries.