On Campus

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Columbia physicists Amber Miller, Michael Tuts, and Brian Greene discuss the search for the elementary particle known as the Higgs boson at a World Leaders Forum event. (Eileen Barroso)

It will be the most important physics discovery in 50 years. If scientists at the Large Hadron Collider near Geneva, Switzerland, are able to confirm the existence of the hypothetical Higgs boson, as is widely expected to happen soon, it will explain why all other elementary particles have mass. This will uphold the Standard Model of particle physics, which is the most widely accepted theory of how subatomic particles interact. But what if they *don't* find the Higgs?

"Well, it's one of those great win-win situations," said Brian Greene during a recent panel conversation with fellow Columbia physicists Amber Miller and Michael Tuts,

along with *Scientific American* editor in chief Mariette DiChristina and *New York Times* science reporter Dennis Overbye. “If they find it, it will be an amazing moment because it will confirm an idea — a purely mathematical idea that tells us that space may be filled with a molasses-like substance through which everything moves — that has been on the table since the 1960s. If they don’t find it, it will be amazing because it will force us back to the drawing board to think of what other explanation we may have for this manifest feature of reality — that particles have mass.”

Tuts, who manages some four hundred physicists searching for the Higgs at the Large Hadron Collider, said that he and his colleagues who are now smashing together protons in a seventeen mile- long circular tunnel are on the lookout for anything unusual: “Our job is to make sure that no matter what our theoretical friends predict, we’re ready and capable of finding whatever is out there. The most exciting thing, of course, would be to find something totally unexpected.”

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