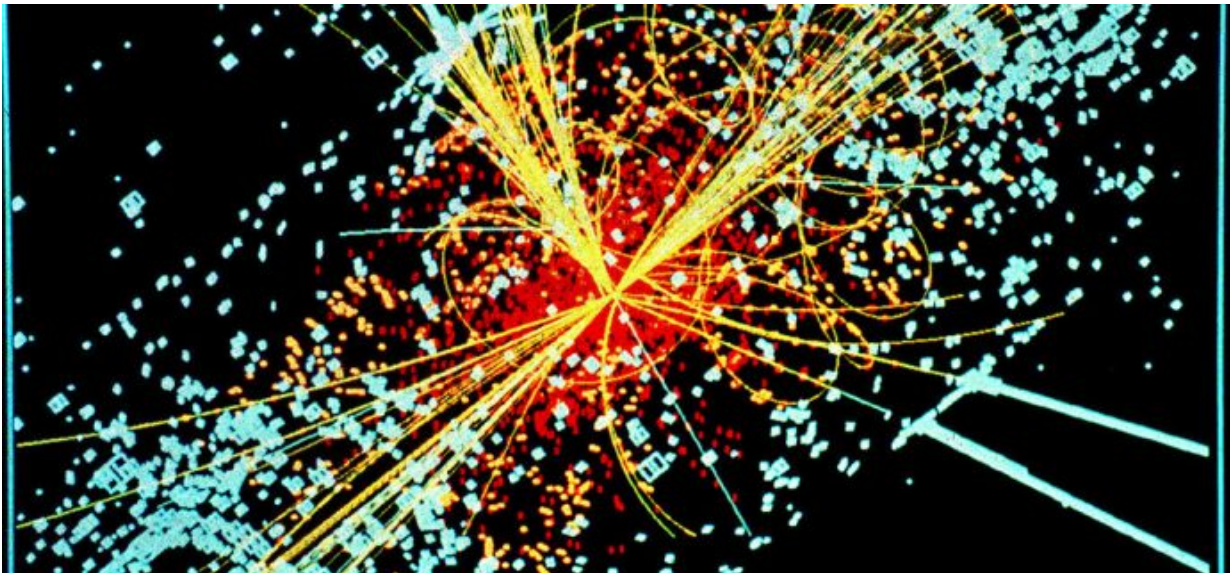


The end of physics? Plus new gene editing dispute

August 15 2016, by Tabitha M. Powledge



Credit: Public Library of Science

It was, potentially, "the [most important discovery in particle physics in a half-century](#)," "a totally unanticipated new elementary particle six times heavier than the recently discovered Higgs particle," according to the very eminent physicist Lawrence Krauss's post at SciAm.

Except, as things turned out, it was no discovery at all. It was, scientists at the Large Hadron Collider acknowledged, statistical noise.

So the Standard Model of physics remains intact. I confess to being somewhat relieved that, in this dizzying year, some widely accepted picture of our world still stands. Scientists (and many science writers) are of course cast down by this news that there is no news. As John Timmer observed at Ars Technica, "it's hard [not to be disappointed](#) that the most promising hint of a new particle (since the Higgs) has turned out to be a bust."

Astrophysicist Ethan Siegel's hand-wringing post at Starts with a Bang asks [how physicists deceived themselves](#) into believing in the new particle. Siegel answers his own question in statistical detail.

But it's easy enough to speculate that the reason physicists deceived themselves is that they are human beings like the rest of us. They Want to Believe. They also needed to believe, as we shall see in a moment. Siegel concluded with wisdom from the late great physicist Richard Feynman: "The first principle is that you must not fool yourself, and you are the easiest person to fool."

Not everyone was disappointed. At the "Intelligent" Design site Uncommon Descent, under the hed "Physics to crack wide open?", Rob Sheldon quotes physicist Sabine Hossenfelder on this "nightmare scenario" for physics. Sheldon adds, "What their theory lacks is court rulings that force it to be taught in publicly funded school, like Darwinism."

What is the nightmare scenario? Hossenfelder explains at her blog BackRe(Action): "[W]e've entered what has become known as the "nightmare scenario" for the LHC: The Higgs and nothing else. Many particle physicists thought of this as [the worst possible outcome](#)," she says. "It has left them without guidance, lost in a thicket of rapidly multiplying models. Without some new physics, they have nothing to work with that they haven't already had for 50 years, no new input that

can tell them in which direction to look for the ultimate goal of unification and/or quantum gravity."

The paleoanthropologist John Hawks's work on human evolution is of course as far as possible from the "Intelligent" Design fantasy. Still, he [also quotes Hossenfelder approvingly](#): "I hope that this latest null result will send a clear message that you can't trust the judgement of scientists whose future funding depends on their continued optimism."

Hawks adds, "My reaction was that a few billion dollars spent on [human origins](#) research would produce a much higher rate of discovery than the LHC."

At Cross-Check, John Horgan doesn't mention LHC's disappeared [new particle](#), but he also quotes the same Hossenfelder remarks about funding prospects for physics that Hawks chose. The occasion for Horgan's post is the 20th anniversary of his hot-button book [The End of Science](#). There he argued that researchers had already revealed the most fundamental truths of the universe, and all that is left is to fill in the blanks.

Horgan concedes that the blanks amount to a ton of stuff, but not fundamental stuff like the Big Bang and evolution by natural selection. He also concedes that his thesis depends on how you define "fundamental." Other basic questions, such as why there is something rather than nothing, may be unanswerable. "The weird thing about my end-of-science thesis is that it can never be said to be true. It can only be said to be true so far. I think it is true so far, and some scientists seem to reluctantly agree."

MEANWHILE, GENETICS: DOES THE NgAgo GENE EDITOR WORK?

In the meantime, back in the lab, scientists are beavering away at filling in those blanks. In the year 2000, Craig Venter forecast that [figuring out genomics would take most of this century](#). So, plenty of work—and funding, one hopes—for the genetics folks. (Including, presumably, the work on human origins that Hawks—and many of the rest of us—so greatly desire.)

This week, a burgeoning controversy over a new form of gene-editing, with a protein called NgAgo derived from the bacterium *Natronobacterium gregoryi*. The method [was published](#) in *Nature Biotechnology* in May, but other researchers are angrily reporting failures to replicate.

The hunt has been on for gene-editing methods other than CRISPR/Cas9 because, despite its widespread use, CRISPR has disadvantages. (I've written about CRISPR here at On Science Blogs a number of times. For example [here](#). Also [here](#).) Heidi Ledford reviewed some alternative possibilities at Nature News early this week (paywall). NgAgo's developer, Han Chunyu at Hebei University of Science and Technology in Shijiazhuang, China, claims that NgAgo cuts only target genes. CRISPR/Cas9 sometimes edits the wrong genes, according to David Cyranoski's post [about the controversy](#) at Nature News (paywall).

Cyranoski reports that Han gets dozens of harassing calls and texts every day, although he remains committed to NgAgo. NgAgo's disappointments have also prompted storms on Twitter and [at Google Groups](#), although somewhat more civil than many an internet trolling.

Throwing away all the #NgAgo transfectants into lysol.
— Tea (@tea_gondii) August 11, 2016

As astonishing comment thread: featuring failures to replicate and a molecular biology troll? (scroll down) t.co/oA8xm1dqkx #NgAgo

— *Neuroskeptic (@Neuro_Skeptic) August 11, 2016*

My guess is it's not looking good for NgAgo. That's because the journal that published the paper, Nature Biotechnology, has launched an investigation. Uh-oh.

Stem cell researcher Paul Knoepfler has been following NgAgo from the beginning at his blog The Niche. ([NgAgo archive here.](#)) He observes, "Hopefully more clarity can quickly be achieved on NgAgo. [Some are comparing NgAgo to STAP](#), but I think that's premature at this stage."

STAP, you may recall, was the big retraction story of 2014-2015, involving a Japanese researcher who claimed in two Nature papers (retracted) to have [created pluripotent stem cells](#) by stressing differentiated mouse cells. [See the STAP recap](#) by Karen Zusi at The Scientist. (STAP = stimulus-triggered acquisition of pluripotency.) The researcher was later stripped of her Ph.D. Shannon Palus summarized [the STAP story to date](#) last February at Retraction Watch.

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