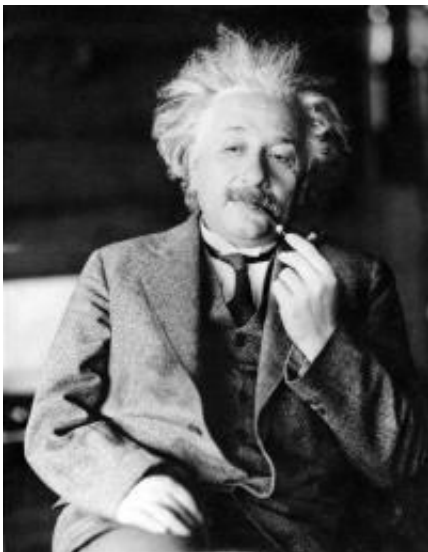


# Challenging Einstein is usually a losing venture

September 23 2011, By FRANK JORDANS and SETH BORENSTEIN ,  
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This undated file photo shows famed physicist Albert Einstein. Scientists at the European Organization for Nuclear Research, or CERN, the world's largest physics lab, say they have clocked subatomic particles, called neutrinos, traveling faster than light, a feat that, if true, would break a fundamental pillar of science, the idea that nothing is supposed to move faster than light, at least according to Einstein's special theory of relativity: The famous  $E = mc^2$  equation. That stands for energy equals mass times the speed of light squared. The readings have so astounded researchers that they are asking others to independently verify the measurements before claiming an actual discovery. (AP Photo)

(AP) -- Betting against Einstein and his theory of relativity is a way to go

broke. For more than a century, everyone from physicists to the Nazi Party - which encouraged the publication of the tract "One Hundred Authors Against Einstein" - has tried to find cracks in his work. And all have failed.

On Thursday, the world's biggest physics lab [unveiled a shocking finding](#) : that one type of [subatomic particle](#) was clocked going faster than the speed of light. If true - a big if, even the scientists there concede - it could undercut Einstein's theories. Physicist Michio Kaku of City College of New York called it "the biggest challenge to relativity in 100 years."

Antonio Ereditato, who participated in the European experiment as head of the [Albert Einstein](#) Center for [Fundamental Physics](#) in Bern, knows what is at stake. After his team fielded two hours of technical questions, some a bit sharp, from a skeptical audience Friday, Ereditato had a beer in hand and was asked about the idea that his work was challenging the secular saint of modern physics.

"Yes, that's why I'm concerned," he said with a laugh.

There's a long history of experimental results that at first seem to contradict relativity, only later to be found to fit neatly with the theory Albert Einstein loved for its simplicity and elegance.

"It's dangerous to lay odds against Einstein," said Rob Plunkett, a physicist at the [Fermilab](#) near Chicago who has tried similar speed-of-light experiments and will now try to test the new findings.

Even Einstein himself was wrong in 1929 when he called his cosmological constant his "biggest blunder." He introduced the constant in his [general relativity theory](#) as a force that keeps the universe from collapsing. In 1998, new findings showed that the universe is

accelerating and that in general Einstein's "blunder" wasn't a mistake.

Harvard University science historian Peter Galison said Einstein's relativity theories have been challenged and "pushed on as hard as any theory in the history of physical sciences ever" and they have survived.

The elegance of Einstein's theory and its proven track record are why nearly every one of the more than a dozen physicists contacted by The Associated Press about the new findings has been cautious, skeptical or downright disbelieving.

The research is the result of a collaboration between France's National Institute for Nuclear and Particle Physics Research and Italy's Gran Sasso National Laboratory.

The scientists fired a beam of neutrinos 454 miles (730 kilometers) underground from Geneva to Italy. They found it traveled 60 nanoseconds faster than light. That's 60 billionths of a second, a time no human brain could register.

"You could say it's peanuts, but it's not. It's something that we can measure rather accurately with a small uncertainty," Ereditato told the AP.

On Friday, hundreds of scientists packed an auditorium at CERN, the European Organization for Nuclear Research, on the Swiss-French border to hear the details. Physicists on the team said they were as surprised as their skeptics about the results, which appear to violate the laws of nature as we know them.

Going faster than light is something that is just not supposed to happen, according to Einstein's 1905 special [theory of relativity](#). The speed of light - 186,282 miles per second (299,792 kilometers per second) - has

long been considered the cosmic speed limit.

"If you find some matter particle such as the neutrino going faster than light, this is something which immediately shocks everybody, including us," Ereditato said.

The experiment needs to be independently reviewed - most likely by teams in the U.S. or Japan.

"If this result holds, and I kind of doubt it, it means we'll have to rewrite all of [modern physics](#)," said Kaku, author of the book "Physics of the Future" and host of a Science Channel television show. "Einstein has come out ahead every single time. However, this time you're talking about the largest particle accelerator in the world registering a significant deviation in relativity."

Columbia University physicist Brian Greene said he would "bet just about everything I hold dear that this won't hold up to scrutiny." But even if the results are confirmed, Einstein's theories will need more of a patch than anything else, he said.

Ereditato agreed.

"When Einstein did his relativity, it didn't destroy what Newton did. In fact, Newton explains 99.9 percent of what is happening around us. But still, in some special conditions of matter, you are forced to use special relativity," Ereditato said. "Now suppose we would find one day that under extreme conditions you have to take into account corrections to what we know now. This doesn't mean that Einstein's wrong."

And this is the glory of science, said Don Howard, who lectures on Einstein and heads the Reilly Center for Science, Technology and Values at Notre Dame University. Experiments are allowed, even encouraged, to

challenge pillars of science.

"Everything is up for grabs," Howard said. "Even a genius like Einstein."

**More information:** CERN site for neutrino project:  
<http://bit.ly/nd9sm1>

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