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OPINION

## Don't Buy Into The Supercollider Hype

By MICHIO KAKU

September 13, 2008; Page A13

If you can read this sentence, congratulations! You just survived the official opening of the Large Hadron Collider (LHC), which an army of critics claim might create mini black holes that will devour the earth. This colossal machine outside Geneva, the largest machine of science ever created, went to full power for the first time on Wednesday, and by mid-October the first real collisions will take place inside the machine.

Amusingly, the LHC criticism has backfired, similar to the way that media criticism of Gov. Sarah Palin has. The more the critics slammed the machine, the more curiosity and intense interest it generated. Subatomic particle physics and string theory, hardly the subject of dinner table conversation, suddenly became the talk of the town. There's now even a rap song about the LHC that's become an instant, monster hit on YouTube.

At the heart of this debate is a truly mammoth machine, 17 miles in circumference, straddling the French-Swiss border. After \$8 billion and 14 years of work by thousands of physicists and engineers, the LHC has finally been fired up. Its purpose is to accelerate two beams of protons to 99.999999% light speed in a huge tube in opposite directions and then slam them into each other to recreate the sizzling temperatures found at the instant of the Big Bang, and thereby unlock the greatest secrets of the universe.


At the very least, physicists hope to find a new particle, called the Higgs boson, the last piece of the Standard Model of particles. But some physicists hope to do even better. The LHC might shed light on the "theory of everything," a single theory which can explain all fundamental forces of the universe, a theory which eluded Albert Einstein for the last 30 years of his life. This is the Holy Grail of physics. Einstein hoped it would allow us to "read the Mind of God."

Today, the leading (and only) candidate for this fabled theory of everything is called "string theory," which is what I do for for a living. Our visible universe, according to this theory, represents only the lowest vibration of tiny vibrating strings. The LHC might find something called "sparticles," or super particles, which represent higher vibrations of the string. If so, the LHC might even verify the existence of higher dimensions of space-time, which would truly be an earth-shaking discovery.

But why, some ask, is this machine being built in Europe, and not the U.S.? President Ronald Reagan originally wanted to build a much larger machine, called the Super Conducting Super Collider, outside Dallas, Texas, to maintain U.S. leadership in advanced physics. Congress allotted \$1 billion to dig a huge circular hole for the machine. But Congress got cold feet and cancelled it in 1993. Then Congress gave physicists another \$1 billion to fill up the hole! As a consequence, Congress guaranteed that leadership in advanced physics would pass from the U.S. to Europe.

Still, critics cling to the fact that the LHC might produce mini black holes that will somehow destroy our world.

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They've even filed a lawsuit in a U.S. District Court in Hawaii demanding an injunction to stop the machine. (While the LHC is outside U.S. jurisdiction, many of its key components come from America, so the lawsuit could, theoretically, cripple the project.)

But if the critics and scaremongers knew their physics, they'd be less frantic. First of all, Mother Nature can hurl cosmic rays of astronomically greater energy than anything the puny Large Hadron Collider can produce. In fact, the LHC is actually a pea shooter compared to what the universe has been hurling at the earth for billions of years. Yet the earth is still here.

Second, these mini black holes are subatomic in size, so tiny they are invisible, like an electron or proton. Their entire energy would not even light up a single light bulb. Black holes, like cats, come in all sizes, from ferocious tigers and lions to purring pussy cats.

Third, these mini black holes are unstable and decay much too quickly to do any damage. These subatomic black holes simply evaporate away (via something called Hawking radiation) faster than the blink of an eye.

There is actually a parallel with the past, in which the media misled the people. Back in 1910, the media correctly stated that the earth would soon pass through the tail of Halley's Comet. The media also correctly stated that there might be poisonous gases in the tail. Almost overnight, these reports sparked mass hysteria around the world -- rumors spread like wildfire, gas masks were sold in the streets, would-be prophets warned of the Apocalypse.

But the media failed to report that the tail of a comet is extremely rarefied -- all the dust in the tail could probably fit inside a suitcase. Eventually the headlines and the panic subsided, and scientists were given a bonanza as they analyzed the comet's tail. Similarly, once the hyperventilating critics get bored with the LHC and find something else to pounce on, science will move on to unlock the secrets of Genesis.

**Mr. Kaku, professor of theoretical physics at City University of New York, is the author of "Physics of the Impossible: A Scientific Investigation into the World of Phasers, Force Fields, Teleportation, and Time Travel" (Doubleday Books, 2008).**

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