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Protons and Champagne Mix as New Particle Collider Is Revved Up

By Dennis Overbye

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BATAVIA, Ill. Science rode a beam of subatomic particles and a river of Champagne into the future on Wednesday.

After 14 years of labor, scientists at the CERN laboratory outside Geneva successfully activated the Large Hadron Collider, the world's largest, most powerful particle collider and, at \$8 billion, the most expensive scientific experiment to date.

At 4:28 a.m., Eastern time, the scientists announced that a beam of protons had completed its first circuit around the collider's 17-mile-long racetrack, 300 feet underneath the Swiss-French border. They then sent the beam around several more times.

"It's a fantastic moment," said Lyn Evans, who has been the project director of the collider since its inception in 1994. "We can now look forward to a new era of understanding about the origins and evolution of the universe."

Outside, a half moon was hanging low in a cloudy sky, a reminder that the universe was beautiful and mysterious and that another small step into that mystery was about to be taken.

Dr. Oddone, who earlier in the day admitted it was a "bittersweet moment," lauded the new machine as the result of "two and a half decades of dreams to open up this huge new territory in the exploration of the natural world."

Roger Aymar, CERN's director, called the new collider a "discovery machine." The buzz was worldwide. On the blog "Cosmic Variance," Gordon Kane of the University of Michigan called the new collider "a why machine."

Others, worried about speculation that a black hole could emerge from the proton collisions, had called it a doomsday machine, to the dismay of CERN physicists who can point to a variety of studies and reports that say that this fear is nothing but science fiction.

But Boaz Klima, a Fermilab particle physicist, said that the speculation had nevertheless helped create buzz about particle physics. "This is something that people can talk to their neighbors about," he said.

The only thing physicists agree on is that they do not know what will happen what laws and particles will prevail when the collisions reach the energies just after the Big Bang.



Some scientists at the Fermilab in Batavia, Ill., showed up in pajamas on Wednesday for the activation of the collider near Geneva. Peter Wynn Thompson for The New York Times

“That there are many theories means we don’t have a clue,” said Dr. Oddone. “That’s what makes it so exciting.”

CERN, on the other hand, is an organization of 20 countries with a stable budget established by treaty. The year after the supercollider was killed, CERN decided to build its own collider.

Fermilab and the United States, which eventually contributed \$531 million for the collider, have not exactly been shut out. Dr. Oddone said that Americans constitute about a quarter of the scientists who built the four giant detectors that sit at points around the racetrack to collect and analyze the debris from the primordial fireballs.

In fact, a remote control room for monitoring one of those experiments, known inelegantly as the Compact Muon Solenoid, was built at Fermilab, just off the lobby of the main building here.

“The mood is great at this place,” he said, noting that the Tevatron was humming productively and still might find the Higgs boson before the new hadron collider.

Another target of physicists is a principle called supersymmetry, which predicts, among other things, that a vast population of new particle species is left over from the Big Bang and waiting to be discovered, one of which could be the long-sought dark matter.

The festivities started at 2 a.m. Chicago time. Speaking by satellite, Dr. Evans, the collider project director at CERN, outlined the plan for the evening: sending a bunch of protons clockwise farther and farther around the collider, stopping them and checking their orbit, until they made it all the way. He noted that for a previous CERN accelerator it had taken 12 hours. “I hope this will go much faster,” he said.

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