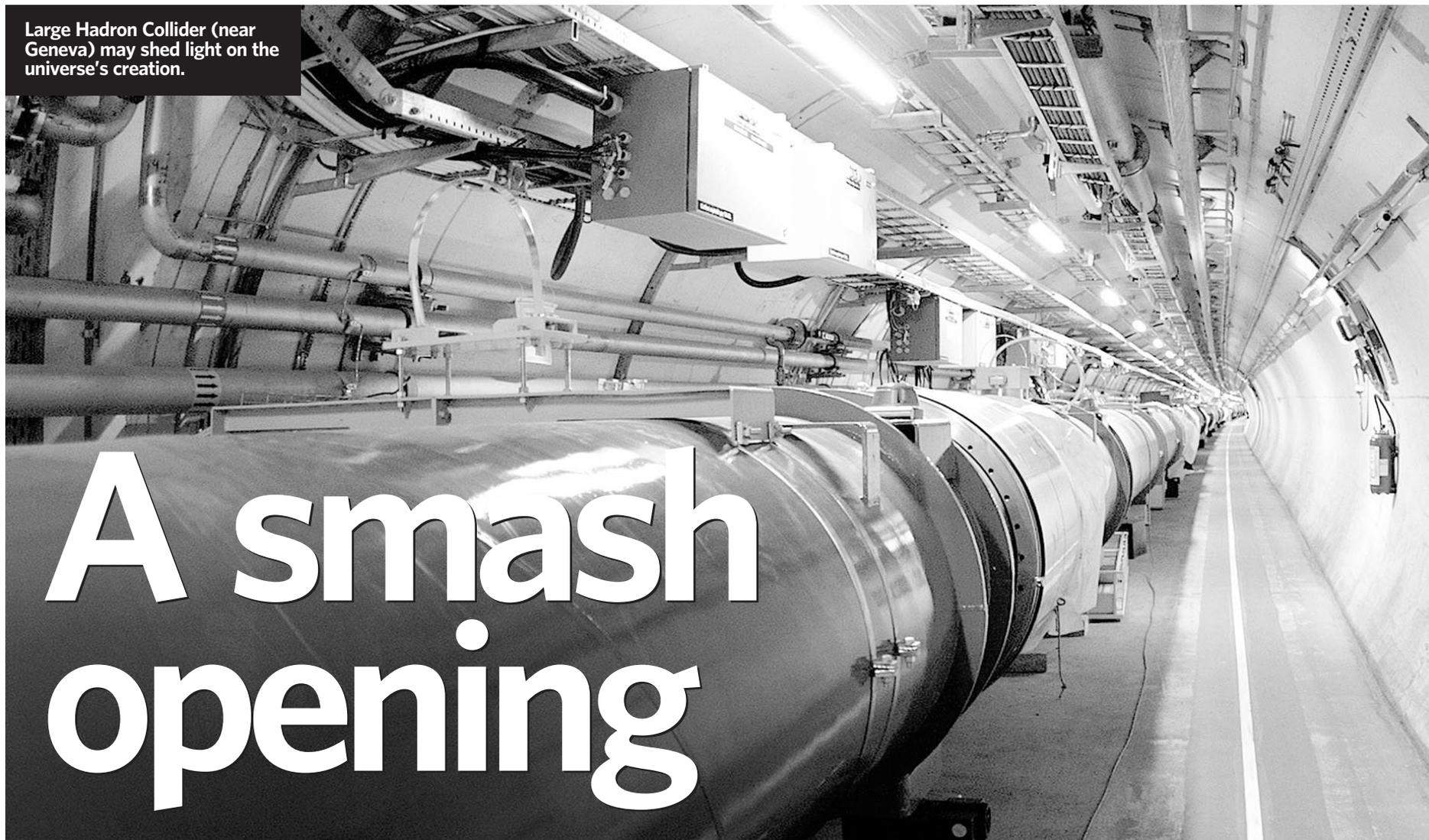


Large Hadron Collider (near Geneva) may shed light on the universe's creation.



# A smash opening

Up and atom in Europe — and in Brookhaven

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**A**s two proton beams collided yesterday inside the world's most powerful atom smasher some 300 feet below the Swiss-French border, data from the record-setting experiment streamed across the Atlantic via fiber optic cable to Brookhaven National Laboratory.

Physicists from the federal lab in Upton helped build parts of the Large Hadron Collider, a massive scientific instrument researchers hope will shed light on the building blocks of the universe by — among other things — mimicking conditions just after the Big Bang.

Now that the collider is up and running, Brookhaven will serve as the U.S. hub for data gathered by one of the biggest

of six experiments at the huge particle accelerator.

Information captured by the ATLAS particle detector will be stored in a specially built room at the lab's physics building. There American researchers can comb through the data for evidence of such holy grails of physics as dark matter, extra dimensions and the Higgs boson — a particle physicists theorize lends mass to matter but whose existence has yet to be confirmed.

"It's the beginning of a physics discovery run," said senior BNL physicist Howard Gordon, deputy operations program manager for the U.S. ATLAS program. "This is the highest energy in the world of collisions."

Yesterday, the Large Hadron Collider successfully crashed two beams of subatomic particles into each other at record energy levels:

a total of 7 trillion electron volts, or TeV. Scientists hope the resulting spray of subatomic debris from these collisions will include particles, such as the Higgs boson, that can explain as yet unanswered questions in particle physics.

Nearly 17 miles in circumference, the collider was built underground near Geneva at CERN, the European Organization for Nuclear Research. Dozens of countries contributed to the project, which has an estimated \$10-billion price tag.

Brookhaven scientists and engineers built a number of components in the ATLAS detector. They also designed and constructed 20 of the 1,200 superconducting magnets that ring the collider. Those magnets, each weighing more than 25 tons, guide the two counter-rotating beams of protons that are crashed into one another.



Scientists hope the collider, at top, will help shed light on the building blocks of the universe.

"It's like colliding two trains together," said BNL spokeswoman Kendra Snyder.

ATLAS and other detectors positioned around the collider identify and measure particles from the spray. Because those particles soon decay, "the physicist's job is to look back and see what these particles were in the beginning," Snyder said.

The experiments are ex-

pected to produce 15 million gigabytes of data each year. Brookhaven is one of 11 "Tier 1" computing centers where most of that data will be stored.

That work began even as the 10 Brookhaven scientists stationed at CERN celebrated the successful collision, Gordon said. "While we were watching our friends being excited, people were starting to analyze the data. It's almost instantaneous."