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Congress canceled the Superconducting Super Collider 15 years ago, and today the project's buildings outside Waxahachie remain deserted.

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May 25, 2008, 4:06PM
SUPER COLLIDER

Behind a scientific success, a failed Texas experiment

A shell of a lab that would have dwarfed Europe's accelerator now gathers weeds near Dallas

By **ERIC BERGER**
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COLLEGE STATION — Under a leaden sky that mirrored his mood, physicist Peter McIntyre eyed a long submarine-shaped magnet resting on the ground.

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Had the Superconducting Super Collider been completed south of Dallas as planned, the magnet would now lie in a 54-mile-long tunnel, accelerating bits of matter to near the speed of light, producing spectacular collisions and re-creating conditions that existed at the universe's beginning.

But after spending billions of dollars, Congress axed the SSC 15 years ago.

The magnet now sits outside McIntyre's lab near the Texas A&M University campus, a weathered reminder of what might have been and an apt metaphor for the state of U.S. high-energy physics.

"It's just a shame," McIntyre said.

Later this year, the Switzerland-based CERN laboratory is scheduled to fire up a new particle accelerator near Geneva. By laying claim to the world's most powerful collider, Europeans will wrest leadership in high-energy physics away from the U.S. after 80 years of American hegemony.

"Europe's now playing in the major leagues, and we're in the minors," said A&M physicist Bhaskar Dutta.

American physicists have dominated the field since the 1930s, when Ernest Lawrence and colleagues at the University of California at Berkeley developed the first cyclotron, an early particle accelerator.

Atomic secrets

The device allowed scientists to discover atomic secrets by accelerating protons to high speeds, slamming them into a target and studying new particles the collisions produced.

The discoveries led, in part, to the development of the atomic bomb. Later spinoffs included the development of cancer therapies and the processing of a host of materials, such as semiconductor chips.

After World War II, the United States built a number of evermore powerful accelerators, culminating with the Tevatron at Fermi National Accelerator Laboratory near Chicago.

The machines seek to create highly energetic collisions between atomic particles. Only at high energies

do the smallest, most exotic particles - which existed at the beginning of the universe — briefly appear.

Existing accelerators already achieve collisions near the speed of light, so the only way to reach higher energies is to build larger rings through which the particles travel.

The Tevatron ring measures about 4 miles in circumference. The SSC ring was to have been 54 miles in circumference, producing collisions 20 times more intense than the Tevatron.

The new European accelerator, called the Large Hadron Collider, will not be as powerful as the mighty SSC would have been. The Large Hadron Collider's ring, about 17 miles in circumference, should be capable of producing collisions about one-third as powerful.

"The SSC would unquestionably have made Texas an exciting center of fundamental research," said Steven Weinberg, a Nobel laureate and physics professor at the University of Texas at Austin. "We terribly regret this wasted opportunity. I'm even sorry for the farmers in Ellis County who had to give up their houses and move away for no reason."

The deserted scene

A drive to the main, 135-acre site just west of Waxahachie yields such a sensation of waste. Amid a pastoral countryside where corn fields mix with scattered country homes, the SSC's main buildings rise incongruously above the plain. The boxy, forlorn structures could house large commercial airplanes.

The tunnels were filled in long ago. The site, for all practical purposes, is abandoned. So little used are the surrounding roads that truck-driving instructors use them for training.

Before the project's cancellation, about 16,000 acres of land were condemned, including about 90 homes. Afterward, the land and buildings were largely deeded to the state, which in turn transferred the property to Ellis County. Bits and pieces were sold.

However, the main buildings and an accompanying 135 acres of land remained unsold until 2006, when a group that included J.B. Hunt, founder of the billion-dollar trucking empire, purchased the property with the intent of marketing it as a high-tech secure data center. After Hunt's death, his estate abandoned those plans.

Earlier proposals — for prisons, schools, movie studios and a Veterans Administration facility — met a similar fate.

"I'm not happy about it, not one bit," said one of the SSC's original champions, U.S. Rep. Joe Barton, a Republican whose district includes Ellis County.

The despair stands in stark contrast to the mood in Europe.

"The attitude here is one of wild enthusiasm," said Paul Padley, a Rice University physicist in charge of building a \$40 million collision detector for the Large Hadron Collider.

"We're motivated by the physics questions we're trying to answer, and we're willing to move heaven and Earth to get the experiment built to answer these fundamental questions about the universe," Padley said.

The United States has contributed hundreds of millions of dollars to the European collider, which may cost as much as \$10 billion, giving American scientists a stake in the project.

"Still, it's incredibly hard for Americans to be effective on a European experiment," said David Toback, an A&M physicist who has worked on the Tevatron and now works on one of the Large Hadron Collider experiments.

That's because Europeans will generally run the large experimental collaborations, interpret the results and publish them. They'll get the lion's share of glory.

The SSC's cancellation followed more than a decade of planning and construction. McIntyre, a magnet designer, was among the earliest evangelists for a Texas accelerator, and he helped arrange an early meeting with then Vice President George H.W. Bush to prod the project along.

Bush helped put it on the fast track. But internal and external forces began working against the project, said Neal Lane, a Rice physicist who served on the SSC's board of overseers and later as President Bill Clinton's science adviser.

From 1987 to 1993, the project's estimated price tag ballooned from about \$4.4 billion to as much as \$12 billion. Some physicists say this reflected poor management.

But other factors were involved, Lane said. Expected money from external sources, such as Japan, never came. In the early 1990s, budget cutting was in vogue. And the Texas delegation, with Lloyd Bentsen leaving the Senate to become secretary of the Treasury Department, lost some of its clout.

As the Cold War ended, the SSC lost support to the international space station, which had a comparable cost and offered an opportunity for rapprochement with the Russians.

"Congress had to have some symbol of fiscal restraint, and we were it," said Roy Schwitters, a UT physicist and the SSC's director.

Pulling the plug

So, after spending more than \$2 billion and digging 14 miles of tunnels, Congress canceled the project in October 1993.

Science fiction author Bruce Sterling captured the mood among physicists during a visit to Waxahachie.

"To say that morale is low at the SSC Labs does not begin to capture the sentiment there," he wrote in an essay titled "The Dead Collider."

At the time, 2,000 people remained at the project, winding it down. They stayed, Sterling wrote, "because, despite their alleged facility at transforming themselves into neurophysiologists, arms control advocates, et al., there is simply not a whole lot of market demand anywhere for particle physicists, at the moment."

The loss extended to Waxahachie and the state in general. The accelerator would have attracted thousands of physicists and brought a new economic and cultural dimension to the area south of Dallas, leading to spinoff computer and cryogenic companies, Lane said.

The opening of the Large Hadron Collider comes at an especially bleak time for U.S. high-energy physics.

Earlier this month, 20 of America's physics Nobel laureates sent a letter to President Bush, urging him to restore half a billion dollars in fiscal year 2008 science funding. As a result of the cuts, physicists say, hundreds of scientists have been laid off and research grants have been slashed.

One surviving lab

In the last few years, the number of high-energy physics labs in the United States has been reduced from three to one — Fermilab, which is itself facing a diminished budget.

The "brain drain" that brought brilliant European physicists - such as Albert Einstein and Enrico Fermi — to America in the 1930s appears to be reversing, U.S. physicists say.

"The entirety of U.S. high-energy physics is at very significant risk," said Al McInturff, who helped develop magnets for the Tevatron, SSC and the Large Hadron Collider. "It's just a very, very painful situation."

"That's something of an understatement," McIntyre added.

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MadDog2020 wrote:

Bush is wasting enough in Iraq to build one of these every month.

Its always a matter of priorities.

5/25/2008 9:42:27 AM

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IamYourFriend wrote:

texasquestion wrote:

"This was typical of the liberal controlled congress of the 90s. Spend billions of dollars to get the project going and then pull the plug."

If memory serves me it was the Republicans who rallied around closing it down as a giant waste of taxpayers's money. And as for economic gloom and doom if either Democrat becomes the next President, I think it will be a tough job to match the financial mismanagement of George Bush and the GOP that controlled Congress for 6 of his 8 years!

5/25/2008 6:02:55 AM

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solar_beta wrote:

we need to invest in smart people and take the lead. if we cut nasa, china and russia will eat our lunch. right now democracy and capitalism doesn't look too brilliant with our enemies chomping our heels. just because we have have missiles, doesn't mean the rest of the world is scared and slowing down.

5/25/2008 1:40:40 AM

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texasquestion wrote:

This was typical of the liberal controlled congress of the 90s. Spend billions of dollars to get the project going and then pull the plug. Then the Europeans develop their own project and gain control of the knowledge and glory. This crap will happen again if Hillary Rodham Clinton or Barack Hussein Obama get the White House. MARK MY WORDS!!!

5/25/2008 1:37:21 AM

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T1nkerbell wrote:

It is a shame this program got trashed. Who knows where this would have led us? Possibly cures for rare diseases? I can think of a lot of other things government spends trillions on that really is useless! We are so behind the times!

5/25/2008 2:07:58 AM

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