

Calendar

Wed., December 13

3:30 p.m. Director's Coffee Break - 2nd Floor Crossover
4:00 p.m. Fermilab Colloquium - 1 West
 Speaker: T. Roberts, Illinois Institute of Technology and Muons, Inc.
 Title: Experimental Tests of Special Relativity

THERE WILL BE NO FERMILAB ILC R&D MEETING THIS WEEK

Thurs., December 14

12:00 p.m. Special Particle Astrophysics Seminar - The Dark Side (WH-6W) (NOTE DATE, TIME, LOCATION)
 Speaker: D. Stojkovic, Case Western Reserve University
 Title: Black Hole Formation, Evaporation and the Information Loss Paradox
1:00 p.m. ALCPG ILC Physics and Detector Seminar - Hornets Nest (WH-8XO)
 Speaker: R. Raja, Fermilab
 Title: The MIPP Experiment Upgrade and Hadronic Shower Simulations
2:30 p.m. Theoretical Physics Seminar - Curia II
 Speaker: G. Kozlov, JINR, Dubna
 Title: Lepton-Flavor Violation, Extra Gauge Bosons and New Physics Scale
3:30 p.m. Director's Coffee Break - 2nd Floor Crossover
4:00 p.m. Accelerator Physics and Technology Seminar - 1 West
 Speaker: P. Adamson, University College, London/Fermilab
 Title: Main Injector Digital Dampers
6:00 p.m. UTeV Seminar - 1 West
 Speaker: R. Field, University of Florida

Special Result of the Week

Lonely top quarks



Dugan O'Neil from Simon Fraser University presented the results at a seminar Friday, December 8.

At the Wine and Cheese seminar Friday, December 8, the DZero collaboration announced that it has found, for the first time ever, evidence for top quarks produced singly, rather than in pairs. Ten years ago, the top quark was discovered at the Tevatron, but it was not alone. Each top quark observed was accompanied by its anti-matter partner, produced by the strong nuclear force in a relationship that has been carefully studied ever since. However, theorists have long pointed out that a top quark could also be found on its own, a lonesome particle without its mate.

At roughly the same mass as a gold atom, the top quark is a heavyweight in the world of elementary particles. However, searching for single-top production is frustratingly similar to panning for gold: only once in every twenty billion proton-antiproton collisions is a top quark expected to be produced by itself. Making matters worse, the signature of such occurrences is easily mimicked by other "background" processes that occur at much higher rates. To stand a chance of seeing the single-top signal, physicists at the DZero

From the Technical Division

Another ILC milestone

This column is written by Marc Ross, head of the Technical Division.



Ruben Carcagno, Cosmore Sylvester and Camille Ginsburg (from left) are managing the ILC RF test stand project. The vertical test pit is behind them.

Early summer Fermilab will achieve a major milestone when our new superconducting RF cavity vertical test stand begins operation inside Industrial Complex building IB1. At that time a new niobium cavity, fabricated in Germany by the ACCEL Corporation and freshly electro-polished in Virginia at the Jefferson Lab, will arrive for testing. Soon after, the new system will begin delivering the results that will be one of our primary contributions to the global ILC superconducting RF test and development effort.

Superconducting cavities are made by forming niobium sheets into bell-shaped half cells and carefully welding these together. In order to obtain the performance we require, the inside of the cavity must be extremely clean, such that it is completely free of contaminants.

At present, the best way to test that the surface has been properly cleaned is to check its performance in a vertical test stand. It is during that critical test that the real "personality" of a new cavity is first revealed.

We expect this test system to become a real



Marc Ross

Title: Toward an Understanding of Hadron-Hadron Collisions: From Feynman-Field to the Tevatron

[Click here for NALCAL](#), a weekly calendar with links to additional information.

Weather



Drizzle 45°/31°

Extended Forecast

Weather at Fermilab

Current Security Status

Secou Level 3

Wilson Hall Cafe

Wednesday, December 13

-Creamy Mushroom Chicken Soup

-Texas Style Meatloaf Sandwich

-Chicken Wellington

-Italian Sausage with Peppers

-Smoked Turkey Panini Pesto Mayo

-Assorted Slice Pizza

-Chicken Alfredo Fettuccine

Wilson Hall Cafe Menu

Chez Leon

Wednesday, December 13 Lunch

Roast Pork Loin with Lingonberry Sauce

Braised Red Cabbage

Dilled New Potatoes

Spiced Honey Cake

Thursday, December 14 Dinner

Coquille St. Jacque Medallions of Pork Tenderloin with Port Mushroom Sauce

Corn Risotto

Vegetable of the Season

Chocolate Fondue with

Assortment of Fruit

Chez Leon Menu

Call x4598 to make your reservation.

Archives

experiment had to develop sophisticated selection procedures. The first stage selected approximately 1,400 candidate events. Of these candidates, only about 60 single-top events were expected, and experimenters exploited every bit of information to unambiguously establish their presence. DZero used three different techniques that combine many discriminating variables in ways that allows physicists to recognize the true single-top events--much like a mother's ability to distinguish identical twins.

With a high degree of agreement among the three measurement techniques, DZero physicists have measured the single-top production cross section at 4.9 ± 1.4 pb, in good agreement with the theory prediction. They estimate the chance of this value to be the result of a background fluctuation at only one in 2,800. Because of this high degree of certainty, the DZero Collaboration has, for the first time, established evidence for single-top production. This analysis also allows the first direct measurement of $|V_{tb}|$ at >0.68 ,

consistent with the presence of only three families of quarks.

These lonely top quarks will find themselves in good company as they join a rich history of high-energy physics at Fermilab.

- [See pictures and graphics](#)
- [Read the press release](#)

Readers Write

Smoot as band director?

Dear FT:

You may find [this aspect](#) of the Nobel Prize ceremony amusing.

Regards,
Jonathan Lewis,
Particle Physics Division

Readers Write

Don't burn wrapping paper

Dear FT:

Every once in a while you share safety tips. Here is a link to a timely [article](#) that anyone with a fireplace should commit to memory.

Regards,
Don Rohde,
Accelerator Division

workhorse, like the older superconducting magnet test stands located nearby. It has two equally important roles, first to check the performance of the cavities, which will then be used for our test facilities, and second to allow Fermilab scientists and engineers to advance this amazing technology and to increase our contribution to the world's effort, applying it to new projects.

Photo of the Day



Rippled sky: AD's Greg Vogel took this picture of last Friday's sunset. He was standing in the parking lot behind the East Booster Tower.

Milestones

Happy birthday Nikolai!

Nikolai Mokhov--an internationally renowned expert in accelerator radiation and beam energy deposition--turns 60 today. His Accelerator Division colleagues congratulate him with jubilee!

If you have a birthday, wedding or other employee milestone to announce, please email us at today@fnal.gov.



Nikolai Mokhov

Announcements

[Fermilab Today](#)[Result of the Week](#)[Safety Tip of the Week](#)[ILC NewsLine](#)[Info](#)

Fermilab Today is online at:
www.fnal.gov/today/

Send comments and suggestions to:
today@fnal.gov

[In the News](#)**From *The Scotsman*, December 11, 2006:****'Ray gun' cancer cure nears speed of light**

Medical scientists will soon be able to offer cancer patients a radical new treatment using hugely accelerated ion particles to target tumors precisely without the dangerous side-effects of current procedures.

The carbon-ion therapy accelerates ions to up to 73 percent of the speed of light in a synchrotron--a machine similar to the particle accelerator at the CERN laboratory in Switzerland--before beams are fired into patients' cancerous cells.

Dr Juergen Debus, the chief radiologist at the Heidelberg Ion Beam Therapy Centre (HIT) in Germany, where the treatment will first be available, claimed the process turned the carbon ions into "miniature precision-guided missiles" that can destroy cancer cells with pinpoint accuracy.

[Read More](#)**Barnstormers annual meeting today**

The Barnstormers Model Airplane Club is holding their annual December Meeting at 5:30 p.m. today in the Users Center Music Room. The club will sell tickets and hold a raffle for two model airplanes. Everyone who is interested is welcome to show up. Contact Andreas Jansson (jansson@fnal.gov) or Jim Zigel (zigel@fnal.gov).

New Computer Programming Courses

The first in a series of new computer programming courses will be given on January 16. Presented in a single two-hour session, the first offering is "To Copy or Not to Copy: A Deeper Look at Values in C++." It is aimed at programmers with C++ experience, and will deal in depth with issues related to copying values in C++ programs. Attendees will learn to identify and take advantage of opportunities for improved performance, and will be prepared for related new techniques that will become available in the next C++ standard. There is no cost to attend, and TRAIN credit will be awarded to participants. Course registration is now open. [View the course announcement and syllabus.](#)

A message from the Employment Office

Employees must update their charitable deductions with Payroll before the end of the year. If you have questions about how to do this, contact Dianne Engram at x4633.

[Upcoming Activities](#)