Fermilab Today

Tuesday, December 12, 2006

Calendar

Tue., December 12
3:30 p.m. Director's Coffee Break - 2nd floor crossover
4:00 p.m. Accelerator Physics and Technology Seminar - 1 West
Speaker: X. Yang, Fermilab
Title: Results in the 3-D Simulation for Booster

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

Click here for NALCAL, a weekly calendar with links to additional information.

Weather

T-Storms 49°/37°

Extended Forecast
Weather at Fermilab

Current Security Status

Secon Level 3

Wilson Hall Cafe

Tuesday, December 12
-Golden Broccoli and Cheese Soup
-Cheesy Greek Squeeze
-Coconut Crusted Tilapia
-Spaghetti with Meatballs
-Toasted Almond Chicken Salad on Croissant
-Assorted Slice Pizza
-Chicken Fajitas

Wilson Hall Cafe Menu

Feature Story

Students visit Fermilab to see science in action

Yesterday 40 students from the Science Academy of Chicago visited Fermilab to learn about life at a physics lab.

The younger students, 3rd, 4th and 5th graders, are currently learning chemistry and began their morning in the Lederman Science Center's lab. Felicia Svoboda, Fermilab docent, explained what colliders at Fermilab do and how the detectors help physicists study particles. Discussing the components of detectors, she held up several pieces of scintillating plastic. The ends glowed. A wave of "awe's" ran through the room. The kids learned that scintillating plastic is one of many types of polymers. Their science classes recently covered the concept of polymers and they are being tested on it later this week.

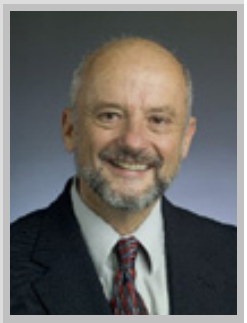
Using borax, Elmer's glue and water the students conducted a mini experiment and made their own polymer. Here two students work together measuring the glue.

Do you know how Foucault's pendulum works? These students now do.

Svoboda explained that while the pendulum's

Director's Corner

Single Top



Pier Oddone

Last Friday the DZero collaboration reported the first evidence for production of single top quarks with a significance level of more than three standard deviations. Single top production is rarer and more difficult to ferret out than the production of top antitop pairs.

The Standard Model of particle physics predicts single top production in proton antiproton collisions. Deviations from this prediction would indicate the presence of new virtual particles in the production processes that yield single top quark events. DZero presented three separate analyses that gave consistent evidence for single top production. Within statistics, the DZero observation is consistent with the Standard Model. A week earlier, the CDF collaboration reported on its own three searches for single top production with one seeing a two sigma hint of single top production.

Clearly so far there is no dramatic deviation from the Standard Model in single top production. Nevertheless, these results open a new line of investigation of the Standard Model. Equally important is what these extraordinarily difficult analyses presage for the future.

In detecting single top production, we try to observe a small excess of events over many more background events that mimic the signal and with no obvious peak rising above the background. The production rate of single top events is at the level of less than one interaction in ten billion. To extract the single top signal one has to develop sophisticated analysis machinery of great power that is sensitive to subtle differences between signal and background--just what will be needed for the observation of a Higgs boson if the Higgs is in the Tevatron mass range. Indeed the signature for single top, two b quarks, a lepton and a neutrino is exactly the signature expected from one of the low mass Higgs

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

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

plane of swinging appears to gradually rotate, its motion is actually staying constant. It is the floor, and the earth beneath the floor, that rotates around it. The pendulum's rate of rotation is dependent on the latitude of where it is located. At Fermilab the rotation is every 36 hours.

Liquid nitrogen always makes for great demos.

Ann Mary Teichert, Fermilab docent, showed that living tissue does not do well when frozen. Members of the older group of students, 6th, 7th and 8th graders, observed the shattering of leaves after they are dipped in liquid nitrogen. During the cryogenics demonstrations students saw that materials react to extreme cold in different ways. They could see that scientists working on cryogenics need to choose their materials carefully.

On the tour, the students also took in the 15th floor and a meeting with Fermilab scientist Denton Morris, an engineering physicist in the Accelerator Division. "This was a very enthusiastic group, they had a lot of energy," said Morris. Morris and the students discussed topics such as the scale of subatomic particles, for example--"If an orange were the size of the earth, would you be able to see the protons inside?" It's good to get them thinking young.

--D.A. Venton

Readers Write

production and decay modes.

These results from DZero and CDF are not only interesting in their own right. They are a significant milestone in developing the machinery needed to hunt down the Higgs.

Accelerator Update

December 8 - 11
- Three stores provided 59 hours and 12 minutes of luminosity
- TeV and MI suffer from VCB problems
- Recycler has kicker trouble
- MI has kicker trouble
- MI had MI beam fall out during the weekend - investigations continue
- Pbar has LCW leak

Read the Current Accelerator Update
Read the Early Bird Report
View the Tevatron Luminosity Charts

In the News

PhysOrg, December 7, 2006:

Better track leads to new particles

In particle accelerators new particles often arise as a result of collisions between elementary particles. However the track left by these particles is often difficult to trace. Dutch researcher Thijs Cornelissen developed an algorithm to reconstruct the particle tracks and that is being used in a European research institute for particle physics. His method provides greater insights into the origin of particles that arise as a result of collisions.

Read More

Announcements

Fermi Singers at Naper Settlement
Be sure to visit the Naper Settlement on Friday, December 15. The Fermi Singers will perform from 9:00 pm to 9:30 pm. They'd enjoy seeing you!

Time to think about retirement plans
As the end of the year approaches, it is time to think about your retirement savings for the upcoming year. Effective January 1, 2007, the maximum amount that you can contribute to your 403(b) supplemental retirement account increases to $15,500. Employees that are age 50 or older, or who will turn 50 during 2007, may make additional catch-up contributions of up to $5000. If you want to change your contribution, you will need to complete an

Pelican Accelerators

A retired DZero physicist wrote about a flock of pelicans that reminded him of an article we reprinted from Nature magazine.

Dear FT:

While reading the December 7 article about an improvement on the principle of the laser wakefield accelerator, I realized that just last week I saw a flock of pelicans using a similar technique.

I was struggling to walk directly into strong headwind blowing parallel to the South Carolina shoreline. To my amazement some pelicans gliding very, very low in single file--and going in the same direction as I--passed by me with ease.

They were riding on the air being pushed in front of the waves. When the wave started to crest and form white water, the pelican line would rise out of the wave trough, pick a suitable wave further out and repeat the process. I couldn't take a photo of this physics application because the blowing sand would have scratched the camera lens. I suppose the shore birds have also solved that problem eons ago.

Best regards,
Tom Marshall
Indiana University, D0, retired

agreement for salary reduction form, which can be obtained from the Benefits Office. If you have questions, please contact Scott Lindsey at extension 4362 or Mary Todd at extension 4361.

Chez Leon needs a Santa
Chez Leon is looking for someone to dress as Santa Claus on December 20 at lunchtime and December 21 at dinnertime. For more information please contact Tita on ext. 3524 Tuesday mornings or Wednesdays before 2:00 p.m.

Upcoming Activities