Fermilab Today

Thursday, September 29, 2005

Calendar

Thursday, September 29

2:30 p.m. Theoretical Physics Seminar - Curia II

Speaker: J. Hubisz, Fermilab

Title: Little Higgs Phenomenology: Past, Present, and Future

3:30 p.m. Director's Coffee Break - 2nd Flr X-Over

Note: There will be no Accelerator Physics and Technology Seminar today

Friday, September 30

3:30 p.m. Director's Coffee Break - 2nd Flr X-Over

4:00 p.m. Joint Experimental Theoretical Physics Seminar - 1 West

Speaker: T. Junk, University of Illinois, Urbana-Champaign

Title: Search for the Higgs Bosons Predicted by the Standard Model and the Minimal Supersymmetric Standard Model at CDF

Weather

Sunny **62º/38º**

Extended Forecast

Weather at Fermilab

Security

Secon Level 3

Cafeteria

Thursday, September 29

- Tomato Florentine
- Grilled Chicken Cordon Bleu Sandwich
- Chimichangas
- Chicken Marsala
- Smoked Turkey Melt
- Italian Sausage Calzones
- SW Chicken Salad with Roasted Corn Salsa

The Wilson Hall Cafe accepts Visa,

Kilminster Takes On CDF's Result of the Week Duties

Robin Erbacher, and the new CDF *Result of the Week* editor, Ben Kilminster.

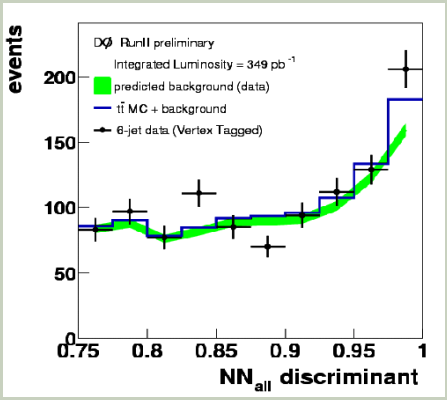
Ben Kilminster has taken the reigns of CDF's *Result of the Week* and is now a contributor to *Fermilab Today's* weekly online column that highlights research from the DZero and CDF experiments. The former editor of the CDF results, Robin Erbacher, chose Kilminster as her replacement after accepting a professorship at the University of California, Davis.

"I immediately thought of Ben," said Erbacher, who was a Fermilab research associate when she began overseeing the CDF articles for the column in February 2004. "It requires someone who can pay attention to the physics output, who's articulate, who can look at the big picture, try to put things into plain English and can handle lots of email." Kilminster, a CDF researcher and a postdoc from The Ohio State University, began *Result of the Week* duties in May by editing submissions from Fermilab scientists, communicating with groups of researchers and attempting to keep up with the hundreds of experiment analyses in progress.

One of the most challenging aspects of the job is transforming in-depth analyses to just a few hundred words, said Erbacher, who handled the job for two years. "As physicists, we love the details,"

Fermilab Result of the Week

DZero: Top Goes All the Way



The output of the artificial neural network that is used to determine the number of top events with a b-quark jet. The green band is the background (no top quarks). The points with error bars show the data the DZero experiment has collected. On the right side of the plot you can see that there are more events than expected from background only. These are attributed to top quarks. For comparison the dark blue line predicts what is expected from theory. (Click on image for larger version.)

The top quark is a remarkable particle; it lives for only a trillionth of a trillionth of a second and is the heaviest known elementary particle. The only place where top quarks can be produced directly and studied in detail is the Fermilab Tevatron collider.

Most top quark studies performed so far use events containing electrons, muons or tau leptons. However, the most abundant source of top quark events is the "all-hadronic" sample. Unfortunately, many tens of thousands of very similar "background" collisions occur for every top quark pair that is produced. Therefore, identifying a sample of top quark events in the all-hadronic sample is very challenging. Nevertheless, it is important to check that top quarks are observed in this sample at a rate consistent with expectations based on the measurements by CDF and DZero experiments in channels containing electrons, muons or tau leptons.

The DZero experiment has managed to isolate a sample of these all-hadronic top quark pairs by requiring the presence of at least six particle jets. The measurement exploits the fact that b quarks are expected in every top quark event. However, even after requiring the presence of b-quark jets there still is more than a hundred times more background than top quarks present, which is why an artificial neural network (a sophisticated computer program that fully

Master Card, Discover and American Express at Cash Register #1.

Wilson Hall Cafe Menu

Cafeteria

Thursday, September 29

Dinner

- Corn Chowder w/Spicy Red Pepper
-Lobster Medallions w/White Wine Sauce
-Spaghetti Squash w/Green Onions
-Sauteed Pea Pods
-Chocolate Almond Napoleons

Wednesday, October 5

Lunch

-Ancho Fried Pork
-Moroccan Sweet Potatoes
-Apple Strudel

Chez Leon Menu

Call x4512 to make your reservation.

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she said. "But you just have to take a step back and say, 'OK, what's the big picture, what's the future, how does this affect particle physics?'"

In the future, *Result of the Week* readers can expect updates on important measurements, Kilminster said. He said many of his nights and weekends are spent preparing for the next week's edition, but like the scientific outcomes he posts, the articles are worth it. "The great thing is there's some pride in it," he said. "It allows physicists to show off their results and attach their faces and names."
—Kendra Snyder

Science Grid This Week

PRAGMA Promotes Pacific Rim Collaboration

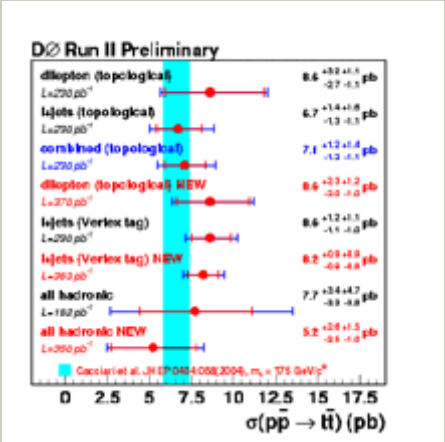
Attendees at the PRAGMA 8 Workshop in Singapore. *Image Courtesy of Kenny Hoi, Bioinformatics Institute, Singapore.*

The Pacific Rim Applications and Grid Middleware Assembly promotes collaboration and resource sharing among researchers in the Pacific region. The project is a grass roots effort that deploys infrastructure and uses grid computing applications to ensure that different suites of middleware being developed in the Pacific Rim work together.

"In the last ten years, enough physical and social infrastructures have been put in place to support true international collaboration," said Peter Arzberger, chair of the PRAGMA Steering Committee. "Instead of a series of bilateral relationships, we wanted to do things in a multilateral fashion."

Read More

recognizes correlations among many variables) is used to distinguish top quark pairs from background collisions. Even after that, there is still about ten times more background than signal, but this is good enough to confirm that the number of top quark pairs that was found is consistent with our expectations.



An overview of the Dzero results. The all-hadronic result is listed at the bottom of the figure. The blue line is the theoretical prediction of the top quark production rate at the Tevatron. (Click on image for larger version.)

Blekman

Nils Gollub (left) and Amnon Harel (center) have contributed to understanding the jet finding algorithms used in this and many other DZero analyses. Freya Blekman (right) is the member of the DZero collaboration that is responsible for the all-hadronic top quark pair cross section analysis. This analysis was done almost entirely from Europe, using the Internet for communication between Fermilab and Imperial College in London, UK, where Freya is based.

Result of the Week Archive

Accelerator Update

September 26 - 28

- During this 48 hour period: 1 store plus existing store provided 33 hours and 45 minutes of luminosity
- "Recycler only" store 4402: 119E30
- Pbar stack lost
- Two TeV quenches
- Recycler record for storing antiprotons: 247E10

Read the Current Accelerator Update

Read the Early Bird Report

View the Tevatron Luminosity Charts

Announcements

In the News

Aurora University News Release September 26, 2005:

Aurora University Submits Proposal for Yerkes Observatory

AURORA, Ill.- Aurora University submitted a proposal on Friday to purchase Yerkes Observatory and the surrounding acreage and buildings located in Williams Bay, Wis., owned by the University of Chicago.

"Our goal is to maximize the long-term educational use of one of America's significant scientific icons and to preserve its physical structure and heritage," said Rebecca L. Sherrick, president of Aurora University.

"We are very conscious of the genuine pride that local residents take in Yerkes and the lake community's dedication to responsible development and careful stewardship of the environment," Sherrick said. "The university's plan is to balance the preservation and conservation of the land and the facility, while at the same time meeting the needs of Aurora University and the local community."

The proposal submitted by the university calls for purchasing a 79-acre parcel of land, including the Yerkes Observatory and telescope, as well as supporting structures. The observatory and 40 acres of land is located adjacent to the George Williams Campus of Aurora University in Williams Bay.

Read More

Women's Organization Luncheon

There will be plenty of food and lively conversation at the NALWO Annual Autumn Luncheon Monday, October 17.

Volunteer for Girl Scout Projects

On November 12, from 9 a.m. to 3 p.m., there will be a Fermilab Girl Scout Badge workshop on site. Volunteers are needed to help with cemetary and village history projects, the prairie harvest, Ask A Scientist/Engineer-type activities and various other things during this event. Anyone and everyone is welcome to help out! If you have any questions or wish to volunteer contact Anne at Lucietto@fnal.gov.

Upcoming Activities