

## Calendar

Thursday, October 21

1:00 p.m. Computing Techniques

Seminar - 1 West

Speaker: D. Duellmann, CERN

Title: The POOL and 3D Projects –

Persistency Framework and Distributed Database Deployment in the LCG

2:30 p.m. Theoretical Physics Seminar -

Curia II

Speaker: E. Boos, Moscow State

University/Fermilab

Title: MSSM Higgs Bosons in the Intense Coupling Regime at the LHC and LC

3:30 p.m. DIRECTOR'S COFFEE

BREAK - 2nd Flr X-Over

4:00 p.m. Accelerator Physics and Technology Seminar - 1 West

Speaker: A. Apyan, Northwestern University

Title: Production of Polarized Positron and Photon Beams for Future Linear Colliders and Beam Dynamics

Friday, October 22

3:30 p.m. DIRECTOR'S COFFEE

BREAK - 2nd Flr X-Over

4:00 p.m. Joint

Experimental/Theoretical Physics

Seminar - 1 West

Speaker: A. Nelson, University of Washington

Title: Dark Energy from Mass Varying Neutrinos, and Neutrino Oscillations

8:00 p.m. Fermilab Lecture Series - Auditorium

Speaker: T. Wittman, The School of the Art Institute of Chicago

## Director General of Research Councils in the United Kingdom Visits Fermilab



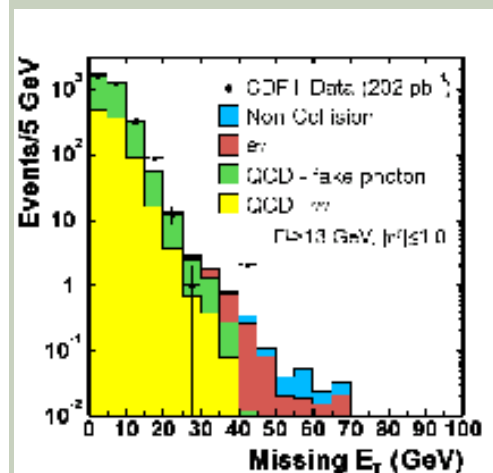
Steve Holmes (left) giving a tour inside the Main Injector to Sir Keith O'Nions (middle) and members of the British Consulate in Chicago and the British Embassy in Washington, D.C.

On Monday, October 18, Sir Keith O'Nions, Director General of Research Councils in the United Kingdom, spent the afternoon touring Fermilab, along with representatives of the British Consulate of Chicago and the British Embassy in Washington D.C. O'Nions also toured Argonne National Laboratory as part of an effort to visit a number of institutions with whom the UK Research Councils have scientific relations. As the Director General, O'Nions oversees a number of scientific agencies, including PPARC.

While at Fermilab, O'Nions had lunch with a group of British users and visited the Main Injector, DZero and CDF. "This was his first visit to Fermilab," said Associate Director for Accelerators Steve Holmes, who hosted O'Nions. "He said that he was very impressed with everything he saw."

## Fermilab Result of the Week

### New Physics with Photons at CDF?



Missing transverse energy is often used as a pointer to possible new physics signals. Recently CDF physicists have searched for anomalous production of diphoton events and found no events with large missing transverse energy. The result is in good agreement with the Standard Model expectations. (Click on image for larger version.)

One of the most exciting hints of possible new physics from the Tevatron Run I came from CDF data. In the last run, CDF studied collisions yielding two high energy photons, looking specifically for the presence of large missing transverse energy (missing  $E_T$ ) in the events. Many models of new physics, including some in Supersymmetry (SUSY), predict an excess of events having large missing  $E_T$ . In those data an event was observed with 55 GeV of missing  $E_T$ . This would be interesting enough except that it also appeared to have a pair of electron candidates, making it even more exciting!

Some authors of the Run I analysis have teamed up again to search the

Title: A Confluence of Art, Science, and Economic Practicality: The Development of the Skyscraper (Tickets: \$5)

### Wilson Hall Cafe

Thursday, October 21

Minnesota Wild Rice soup with chicken

Tuna Melt on Nine Grain \$4.75

Breaded Veal with Mushroom Cream Sauce \$3.75

Sweet & Sour Pork over Rice \$3.75

BLT Ranch Wrap \$4.75

Cheesy Breadsticks \$2.25

Winter Mix Salad \$4.75

[Wilson Hall Cafe Menu](#)

[Chef Leon](#)

### Weather



Patchy Fog 59°/48°

[Extended Forecast](#)

[Weather at Fermilab](#)

### Current Security Status

[Secou Level 3](#)

### Search

Search the Fermilab Today Archive

### Info

Fermilab Today is online at:

<http://www.fnal.gov/today/>

Send comments and suggestions to

[today@fnal.gov](mailto:today@fnal.gov)

[Fermilab Today archive](#)

[Fermilab Today PDF Version](#)

[Fermilab Result of the Week archive](#)

### Shutdown News

## Universities Help to Upgrade Booster



Jeff Larson doing maintenance in the Booster (Click on image for larger version.)

After nine weeks of a scheduled shutdown, the first machines of Fermilab's chain of accelerators are slowly coming "back to life." It will be early December before the Tevatron has beam again, but the Linear Accelerator is already back up and the Booster is getting ready this week.

"We plan to start up beam this week," said Eric Prebys, who is in charge of the Booster. "We have a couple of checkouts to do and we have to see whether the vacuum will be good enough. We need to let the pumps run long enough."

The shutdown goal for the Booster is to increase the number of protons that the machine can accelerate per cycle. The Booster provides beam to the MiniBooNE neutrino experiment as well as the Main Injector, which distributes beam to the Tevatron collider, the antiproton source, and--beginning in December--to the MINOS neutrino experiment. A larger number of protons allows all experiments to

Run II data, taking advantage of the new and more powerful CDF detector, higher energy and increased dataset. The hope is that with the improved sensitivity, more exciting hints of new physics will show up. Unfortunately, no similar super-event has appeared so far in this run. While this is disappointing, the researchers remain optimistic, as quite a bit more data have already been collected, and much more are on the way.

The analysis has more to say, however. Most searches provide limits on models of new physics, and in this analysis, CDF has set limits on an important model of Supersymmetry. In Gauge-Mediated SUSY breaking, the production of pairs of SUSY particles leads to two "neutralinos", which in turn each decay to a photon and a gravitino. The gravitino does not interact in the detector, producing the large missing  $E_T$  signature. This analysis result has excluded a lightest chargino mass less than  $167 \text{ GeV}/c^2$ , and lightest a neutralino mass less than  $93 \text{ GeV}/c^2$ . CDF will set stronger limits, or perhaps find new physics, as Run II continues.



[Fermilab Safety Tip of the Week archive](#)

[Linear Collider News archive](#)

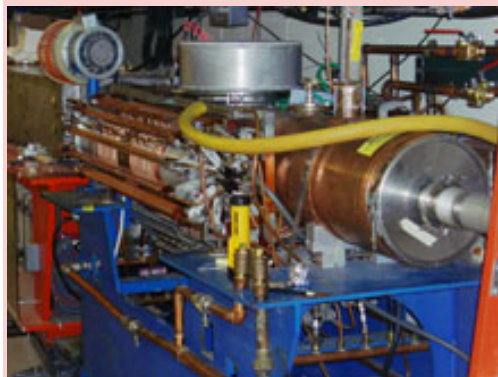
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take more data, increasing the potential for discovery.

During the shutdown, technicians installed an additional RF cavity in the Booster, bringing the total number to 19. The new cavity has a larger opening that will reduce beam loss, preventing the cavity from getting too hot. "The aperture is five inches compared to two-and-a-quarter in the old ones," said Rene Padilla, manager of the cavity project. "The cavity is installed and has been power tested. All we need to do is finish some equipment outside the tunnel, which can be done when the machine is running."

The new cavity is one of two units built with the help of six universities-- Caltech, Columbia University, Indiana University, Princeton, Tufts University and the University of Texas at Austin, which are involved in the MINOS and MiniBooNE experiments. University machine shops helped to fabricate cavity components. "It was an effective collaboration," Padilla said. "We managed to build two large-aperture cavities for little money."



The new large-aperture cavity in the Booster (Click on image for larger version.)

#### In the News

(Left to Right) David Toback (Texas A&M), Sung-Won Lee (Texas A&M), Ray Culbertson (Fermilab), Minsuk Kim (Kyungpook) and Dong-Hee Kim (Kyungpook) have all worked on searching for new physics with photons. (Click on image for larger version.)

[Result of the Week Archive](#)

#### Announcements

##### GSA Halloween Party

The GSA will host their annual Halloween costume party on the evening of Friday, October 29 in the Kuhn Barn. Prizes will be awarded for the best costume. Food and drinks will be served. And back by popular demand, apple bobbing will also be available.

[more information](#)

##### Fermilab Lecture Series this Friday

Timothy N. Wittman, Adjunct Professor of Architectural History & Historic Preservation, The School of the Art Institute of Chicago will present "A Confluence of Art, Science, and Economic Practicality: The Development of the Skyscraper." this Friday, October 22 at 8:00 p.m. in Ramsey Auditorium.

[more information](#)

##### New Books in the Fermilab Library

New books in the Fermilab Library for the week of October 18 are now on display in the Library near the front desk. A list of the of [new books](#) is available online. New books may be reserved by using the [online Library catalog](#), or by calling the library at x3401, or by filling out the reserve card in the book.

##### Upload Your Ph.D. Thesis

We would like to remind students and

## From *Nature*, October 21, 2004

### Going public

*Should scientists let the public help them decide how government research funds are spent? Yes they should, because the consequences are to be welcomed, not feared.*

Science communication, circa 1600: discussions with the public, according to one prominent researcher, are little better than listening to the "maunderings of a babbling hag". So said William Gilbert, a pioneer of research into electricity and magnetism.

Today's scientists are, at least in the main, a more open-minded bunch. But the prejudices and fears that underlie Gilbert's remark have not entirely gone away, as reactions to some new initiatives show.

[Read more](#)

their advisors that Ph.D. theses done at Fermilab should be uploaded to our [Technical Publications website](#). The URA tracks the number of theses we produce each year.

### Power Outage News

#### MI-65

October 25 – Power will be off to the MI-65 service building and tunnel for 5 hours starting at 2 PM on Monday.

#### MI-40

October 27 – The power will be off to the MI-40 service building and tunnel for three and a half hours starting at 8:30 AM on Wednesday.

### [Upcoming Activities](#)