

## Calendar

[Have a safe day!](#)

Thursday, June 4

9 a.m.

[Users' Annual Meeting](#) - Auditorium

THERE WILL BE NO THEORETICAL PHYSICS SEMINAR TODAY

3:30 p.m.

DIRECTOR'S COFFEE BREAK - 2nd Flr X-Over

4 p.m.

Accelerator Physics and Technology Seminar - Curia II (NOTE LOCATION)

Speaker: Hyung Jin Kim, Fermilab

Title: Wire Compensation and

Electron Lens Compensation of Beam-Beam Interactions in RHIC and the LHC

Friday, June 5

11 a.m.

[Special Theoretical Physics Seminar](#) -

Curia II (NOTE DATE and TIME)

Speaker: Octavian Micu, TU Dortmund

Title: Explaining LSND and

MiniBooNE Using Altered Neutrino Dispersion Relations

Noon

[Special Outreach Colloquium](#) -

Auditorium (NOTE DATE, TIME & LOCATION)

Speaker: Michael Turner, University of Chicago

Title: Communicating the Excitement of Science

3:30 p.m.

DIRECTOR'S COFFEE BREAK - 2nd Flr X-Over

4 p.m.

[Joint Experimental-Theoretical](#)

[Physics Seminar](#) - One West

Speaker: Gene Flanagan, Purdue University

Title: First Observation of Vector Boson Pairs in a Hadronic Final State at CDF

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

## Weather

## University Profile

### Northern Illinois University



Ed Black, Mary Anne Cummings, Sasha Dychkant and Dave Hedin with the test window at NIU.

NAME:

[Northern Illinois University](#)

HOME TOWN:

DeKalb, Illinois

MASCOT:

Huskie

SCHOOL COLORS:

Cardinal red and black

PARTICLE PHYSICS

COLLABORATIONS:

DZero, ATLAS, CALICE.

EXPERIMENTS AT FERMILAB:

DZero, CALICE and R&D for beam physics using the photo injector and muon-based accelerator.

SCIENTISTS AND STUDENTS AT FERMILAB:

Five scientists and 10 students.

COLLABORATING AT FERMILAB SINCE:

1986

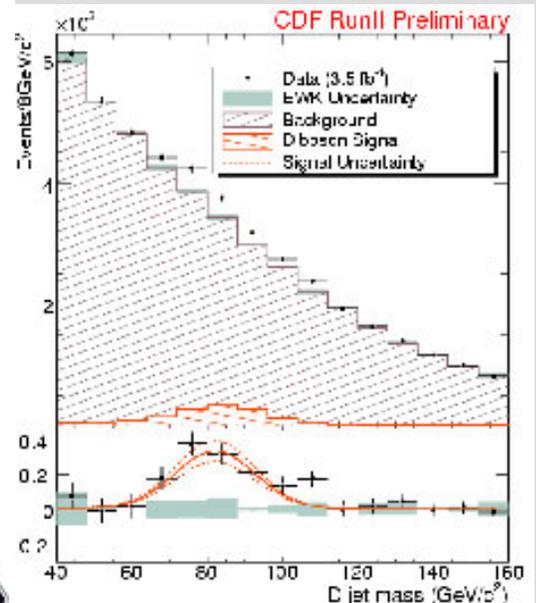
MAJOR CONTRIBUTIONS:

Design construction and operation of the DZero muon detector, design and operation of the DZero trigger systems, data collection and data analysis. NIU collaborators wrote 90 percent of the software for the muon system used in Run 1. NIU Professor Gerald Blazey served as DZero co-spokesperson from 2002 to 2006. NIU has participated in detector R&D for the ILC since 2001. NIU is also a partner in the Scintillator Detector Development Laboratory, located in the



## Fermilab Result of the Week

### CDF diboson observation a big step toward Higgs



(Top) A comparison of the reconstructed mass of the two jets in the data events and the background model. A clear excess can be seen around the mass of the  $W/Z$ . (Bottom) The difference between the data and the background model reveals our signal peak. Calorimeter resolution prevents  $W$  and  $Z$  masses from being distinguishable.

In order to convince someone that you could land on the moon, you would first need to convince that person that you could launch someone into space. Similarly, before anyone will believe it is possible to see the Higgs boson, we must show that it is possible to observe the diboson process.

Recently, scientists at the CDF collaboration reached this first milestone when they searched for and observed the decay of a pair of  $W$  or  $Z$  bosons in which one of the pair decays into two particle jets and other into two leptons.

Physicists already know that the Tevatron can produce collision events with  $W/Z$  pairs. These events were observed in data samples that had very few contaminating background events. The samples had few background events because scientists required that both bosons decay into leptons. However, when one of the bosons in the sought-for process decays to a jet pair rather than a lepton pair, an overwhelming number of background events obscure the diboson contribution. These events come from processes in which the observed jets originate from more common QCD-production mechanisms. In fact, there are thousands of background events for every signal event.



[Extended Forecast](#)  
[Weather at Fermilab](#)

[Current Security Status](#)

[Secou Level 3](#)

[Wilson Hall Cafe](#)

Thursday, June 4

- Minnesota wild rice w/chicken
- Tuna melt on nine grain
- Italian meatloaf
- Chicken casserole
- Buffalo crispy chicken wrap
- Assorted sliced pizza
- \*Mandarin chicken

[Wilson Hall Cafe menu](#)

[Chez Leon](#)

Thursday, June 4

Dinner

- Spinach phyllo roll-ups
- Grilled swordfish
- Ginger sesame jasmine rice
- Steamed asparagus
- Orange cream cheesecake

Wednesday, June 10

Lunch

- Spicy tilapia w/pineapple pepper relish
- Basmati rice
- Blueberry custard parfait

[Chez Leon menu](#)

Call x3524 to make your reservation.

[Archives](#)

[Fermilab Today](#)

[Result of the Week](#)

[Safety Tip of the Week](#)

[ILC NewsLine](#)

[Info](#)

Fermilab Village.

#### RESEARCH FOCUS:

Prior to 1995: aiding the search for the top quark. Post 1995: searching for new phenomena at the highest available energies.

#### WHAT SETS PARTICLE PHYSICS AT NORTHERN ILLINOIS UNIVERSITY APART?

We're the closest university to Fermilab. Because of our proximity, we've had extensive involvement of undergraduates in the construction and operation of DZero. Since 1986, NIU has had 79 graduate students in experimental particle physics. Of those, 77 have worked at Fermilab. The university also has had 86 undergraduates who have worked at Fermilab.

#### FUNDING AGENCY:

Base funding is from the National Science Foundation, with a small portion coming from the Department of Energy.

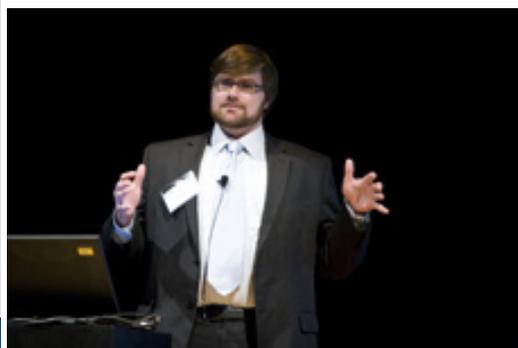
#### FAVORITE NATIONAL LABORATORY: Fermilab



View all [University profiles](#)

#### Feature

### Annual Users' Meeting continues today



Graduate Student Association representative and Dzero collaborator Tyler Dorland gives a presentation on the association's activities, usefulness and outreach efforts during

Still, requiring one of the bosons to decay to a jet pair is of particular interest for the following reason: the event signature looks very much like that of a light Higgs particle, in which the Higgs decays to two jets alongside the leptonic decay of a W or Z. Due to the higher production rate of the diboson process, scientists must be able to observe this process before they can hope to isolate the even smaller potential contribution in this final state originating from Higgs boson production.

In order to make identifying the signal easier, CDF scientists reduced the number of background events by requiring a large energy imbalance in the calorimeter. This imbalance was due to non-interacting neutrinos of the W or Z decay. Additionally, an event-by-event figure of merit, which further discriminated against fake imbalances due to energy mismeasurement, was applied to the sample. With backgrounds under control, a distribution of the masses of the jet pairs from each event indicated a bump in the region of the W and Z masses (80.4 and 90.1 GeV/c<sup>2</sup>, respectively), as seen in the figure. The next step is to seek diboson pairs with even more Higgs-like decay signatures by requiring b-quark jets.

-- edited by Craig Group

[Learn more](#)



The scientists responsible for this exciting result are pictured from left to right: John Freeman, Fermilab; Gene Flanagan, Purdue; Vadim Rusu, Fermilab; and Sasha Pronko, Fermilab.

#### Accelerator Update

June 1-3

- Two stores provided ~46 hours of luminosity
- Pelletron developed high-voltage problems
- Pbar dry engine flywheel repaired
- MTest T979 experiment ends current run

[Read the Current Accelerator Update](#)

[Read the Early Bird Report](#)

[View the Tevatron Luminosity Charts](#)

#### Announcements

**Fermilab Today**

is online at:  
[www.fnal.gov/today/](http://www.fnal.gov/today/)

Send comments and suggestions to:  
[today@fnal.gov](mailto:today@fnal.gov)

Visit the Fermilab  
[home page](#)

[the first day of the 2009 Users' Meeting.](#)

This year's annual Users' Meeting will continue today with updates on experiments from around the globe, physics at the energy and intensity frontiers, experiment results and future plans.

All Fermilab employees are invited to attend.

An Outreach Workshop will take place in conjunction with the Users' Meeting today and tomorrow. It will feature panel discussions, a special outreach colloquium by Michael Turner and the traveling show "[Wonders of Physics](#)", which will take place at 1 p.m. in the Auditorium.

### In the News

## Lucia Votano named director of the National Laboratory in Gran Sasso

From *Interactions.org*, June 3, 2009

Lucia Votano has been appointed by the Board of Directors of the Istituto Nazionale di Fisica Nucleare (INFN, Italy's National Institute of Nuclear Physics) as the Director of the National Laboratory in Gran Sasso, the world's largest underground laboratory for astroparticle physics. This is the first time that a woman has been named as Director of one of INFN's four large national laboratories.

The physicist Lucia Votano is the first woman to be named as Director of the National Laboratory in Gran Sasso of Italy's National Institute of Nuclear Physics (INFN). The appointment was made by INFN's Board of Directors, following the proposal of the Council. Doctor Votano will take office in September, when the second and last term of the current Director, Professor Eugenio Coccia, expires.

[Read more](#)

### In the News

## Einstein's 'spooky physics' gets more entangled

From *Live Science*, June 3, 2009

Quantum entanglement is just spooky — even Einstein thought so. As if particles (as in particle physics) have telepathic empathy. The theory of quantum mechanics predicts that two or more particles can become "entangled" so that even after they are separated in space, when an action is performed on one particle, the other particle responds immediately. Scientists still don't know how the particles send these instantaneous messages to each other, but somehow, once they are entwined, they retain a fundamental connection. This

## Latest Announcements

[Donors needed for Fermilab Blood Drive June 23 & 24. Give a pint - Get a quart of Oberweis ice cream](#)

[Intermittent hours for Users Office - today](#)

[Scrapbooking open house](#)

[Winners of the Asian/Pacific quiz contest](#)

[Pool Memberships are available in the Recreation Department](#)

[New URA e-mail address](#)

[Argentine Tango classes through June 24](#)

[Discount tickets to "1964"...Beatles tribute - June 6](#)

[Accelerated C++ Short Course: registration open - June 8](#)

[International folk dancing - cancelled today, resumes at Auditorium June 11](#)

[Python Training June 17-19](#)

[Toastmasters meeting June 18](#)

[NALWO "A Summer Evening Potluck Picnic"](#)

[English Country Dancing, June 21](#)

[Microsoft Office 2007 help at the Library](#)

[Environmental Safety and Health Fair - June 29](#)

[Process piping \(ASME B31.3\) class offered in October](#)

[Discounted Rates at Grand Geneva Resort, Lake Geneva, WI](#)

[SciTech summer camps](#)

[Intermediate/Advanced Python Programming July 22-24](#)

[Science adventures for children](#)

bizarre idea riled Einstein so much he called it "spooky action at a distance."

[Read more](#)

[Additional Activities](#)

[Submit an announcement](#)