

## Furlough Information

### Reminder:

An IDEAS representative will conduct small group meetings every 30 minutes in the Wilson Hall Atrium Dining Room (SW corner) each Friday from 11 a. m. to 1:30 p.m. from tomorrow through the end of March.

New furlough information, including an [up-to-date Q&A](#) section, appears on the [furlough Web pages](#) daily.

## Calendar

### Thursday, Feb. 28

THERE WILL BE NO PHYSICS AND DETECTOR SEMINAR THIS WEEK  
**2 p.m.**

[Computing Techniques Seminar](#) - FCC1

Speaker: S. Timm, Fermilab  
 Title: FermiGrid Virtualization and Xen  
**2:30 p.m.**

[Theoretical Physics Seminar](#) - Curia II

Speaker: Y. Bai, Fermilab  
 Title: Minimal Little Higgs Model and Dark Matter  
**3:30 p.m.**

DIRECTOR'S COFFEE BREAK - 2nd Flr X-Over  
**4:00 p.m.**

[Accelerator Physics and Technology Seminar](#) - One West

Speakers: Y. Iwashita, Kyoto University  
 Title: High-Resolution Surface Inspection Camera for Superconducting RF Cavities

### Friday, Feb. 29

**3:30 p.m.**  
 DIRECTOR'S COFFEE BREAK - 2nd Flr X-Over  
**4:00 p.m.**

[Joint Experimental-Theoretical Physics Seminar](#) - One West

## Feature

### "NUMB3RS" (D)Zeros in on Fermilab

Every week Larry Fleinhardt helps stop bomb-toting terrorists or serial criminals.

He teaches at a top-notch university.

And although quirky, he won the heart of a beautiful woman.

What could top that? Working with DZero at Fermilab to solve the mysteries of the universe and find the Theory of Everything.

Fleinhardt, played by actor Peter MacNichols, is a sidekick character on the crime drama "NUMB3RS." He accepted an invitation to join DZero during the Jan. 18 episode, calling DZero's research "the work of a lifetime."

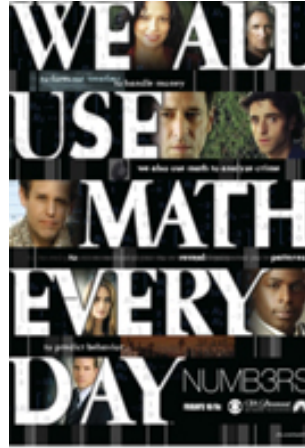
The show's writers were drawn to DZero's apt numerical name and its quest to find the Higgs boson. The characters use math to solve crimes and increasingly reference math-based particle physics.

Like real-life physicists, Fleinhardt hit a roadblock trying to create an 11-dimensional supergravity theory, said co-writer Nick Falacci.



The search for an answer takes Fleinhardt to his particle physics roots and a cutting-edge study of extra-dimensional gravitons and the Higgs boson, Falacci added. DZero and its sister detector collaboration, CDF, are leaders of that search at the energy frontier.

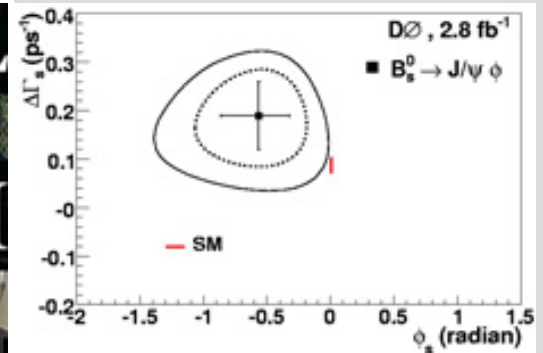
DZero members love the



"NUMB3RS," a show on CBS Channel 2, features a fictional theorist physicist who mentioned joining DZero in a recent episode.  
*Image courtesy of CBS*

## Fermilab Result of the Week

### New mixing in the standard recipe?



This figure demonstrates DZero's measurement of  $\Delta\Gamma_s$  and  $\Phi_s$  in the  $B_s$  meson system along with the regions compatible with the measurement at 68.3 percent (dashed black line) and 90 percent (solid black line) confidence level. The Standard Model prediction shown as a solid red line.

When particle physicists predict experiment outcomes, they follow a recipe known as the Standard Model: add quarks and leptons to give the batter some substance, pour in electroweak and strong interactions to bind the ingredients together, and then mix just right. From neutrinos to quarks, different particle systems need different mixing. Too much or too little mixing will not bake up to reproduce our universe. Because of the success of the venerable SM recipe, DZero physicists were surprised to find something strange when studying mixing in the  $B_s$  meson system.

The neutral  $B_s$  meson, made of bottom and strange quarks, can be found in nature in two distinct configurations with different masses and lifetimes. These configurations are understood to be composed of a mixture of states that conserve charge-parity (CP). The SM recipe suggests that this mixing should result in a very small violation of CP conservation. By observing decays of  $B_s$  mesons, physicists can determine how much CP mixing really occurs in the  $B_s$  system, much like tasting a soufflé to determine a baker's secret ingredient. DZero physicists analyzed  $B_s$  meson decays to  $J/\Psi$  and  $\Phi$  mesons (consisting of charm+anti-charm and strange+anti-strange quarks, respectively).

Speaker: R. Hill, Fermilab  
 Title: The Anomalous Baryon Current and Neutrino-Photon Interactions in the Standard Model

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

**Weather**

 Afternoon snow 27°/25°

[Extended Forecast](#)

[Weather at Fermilab](#)

**Current Security Status**

[Secon Level 3](#)

**Wilson Hall Cafe**

**Thursday, Feb. 28**

- Santa Fe black bean
- Sloppy Joe
- Chicken cordon bleu
- Steak
- Baked ham & Swiss on a ciabatta roll
- Assorted pizza slices
- Crispy fried chicken ranch salad

[Wilson Hall Cafe menu](#)

**Chez Leon**

**Thursday, Feb. 28**

**Dinner**

- Sancocho w/pastetobos
- Roast suckling pigs
- Chayote guisado
- Rice & pigeon peas
- Flan & tropical fruit

**Wednesday, March 5**

**Dinner**

- Pork satay w/peanut sauce
- Sautéed asian vegetable
- Baked lime custard

[Chez Leon menu](#)

Call x4598 to make your reservation.

**Archives**

Larry Fleinhardt, a fictional physicist on the crime drama show NUMB3RS, recently accepted an invitation to join Fermilab's DZero collaboration during a January episode. Fleinhardt is played by Peter MacNichol. *Image courtesy of CBS.*

idea of inclusion of the show and have created an office for the make-believe physicist in the assembly building.

"I expect it will make more people aware of the work that we do and (if the plot develops) how we actually learn about particle physics," said DZero spokesman Darien Wood.

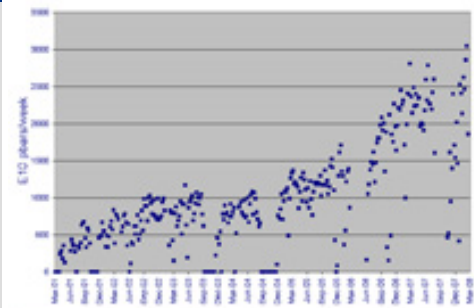
"The characters on the show speak with great excitement and reverence about the search for the Higgs boson at DZero, and I think it captures some of the passion that we real particle physicists have for our work."

The show's creators declined to say how involved the story line will become or if Fermilab will end up on camera.

"Larry's impending involvement with the DZero team will allow 'NUMB3RS' viewers a chance to follow Professor Fleinhardt on his investigative journey into the very strange and fascinating world of fundamental particles," Falacci said.

-- Tona Kunz

**Record luminosity, pbar stacking records reached**



This figure shows the weekly antiproton production. Fermilab set a record last week for most antiprotons collected in a single week.

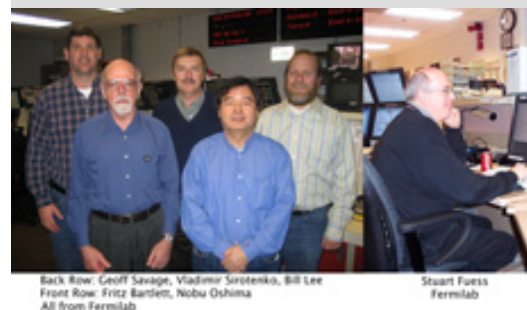
Yesterday's Tevatron store #5934 had the highest peak luminosity since the end of the 2007 shutdown and the second best initial luminosity in history, at 2.86E32. The best was 2.92E32 on Feb. 25, 2007. Also, last week, the Antiproton Source set a new Pbar weekly record for most antiprotons collected in a single week. Congratulations to all!

When these secondary mesons then decay to two muons and two charged kaons, the DZero researchers were able to get a picture of what happened. By carefully identifying the unique matter and anti-matter versions of the B<sub>s</sub> meson, they were able to measure how the CP states of the system were mixed.

In 2.8 inverse femtobarns of data, DZero scientists measured the lifetime difference between the mass eigenstates to be  $\Delta\Gamma_s = 0.19 \pm 0.08 \text{ ps}^{-1}$  and found a CP-violating mixing phase of  $\Phi_s = -0.57 \pm 0.31$ . Though compatible with the SM prediction, such an outcome is statistically expected in only one out of 20 measurements with comparable precision. More data are needed to determine if this result is a fluctuation or a sign of new physics. It's clear that DZero will keep the B<sub>s</sub> meson prominent on its physics menu, eager to see if this taste test truly indicates a new recipe for B<sub>s</sub> mixing.



A team of researchers from the DZero collaboration made primary contributions to this analysis.



The DZero On-line/Controls team provides reliable support for the experiment's on line computing resources and for the control and monitoring of thousands of parameters of the DZero detector in real time. Their hard work is critical for recording the high-quality data used in all DZero physics analyses.

**[Result of the Week Archive](#)**

**Fermilab Today****Result of the Week****Safety Tip of the Week****ILC NewsLine****Info**

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)

**In the News****U of C asks Congress to aid research**

From *Chicago Maroon*,  
Feb. 26, 2008

President Zimmer joined a coalition of university and research industry leaders on Capitol Hill earlier this month to lobby members of Congress and the Bush administration for more funding for scientific research. The officials mobilized in response to a budget cut earlier this year that slashed millions of dollars for science research in this year's final federal budget proposal.

Bob Rosenberg, associate vice president for public affairs and communications at the University, said that the lobbyists are concerned that "the direction of funding for research in this country is flat and trending downward."

The coalition said that they hoped to make a dramatic statement about the importance of funding scientific research through a strong show of numbers. Zimmer was joined by the presidents of Duke University, the University of Maryland, the University of Minnesota, Pennsylvania State University, the University of Alabama, and the University of New Mexico. Industry leaders such as Norman Augustine, retired CEO and chairman of Lockheed Martin Corp.; and Christopher Hansen, president and CEO of American Electronics Association, also participated.

[Read more](#)

**In the News****Minooka HS plans science celebration**

From *Herald News*,  
Feb. 26, 2008

MINOOKA -- Science teachers, industry leaders, and organizers of the Illinois Science Teachers Association met at Minooka High School this week to discuss ways to celebrate next year's anniversary of the formation of the National Academy of Science and the birthdays of Charles Darwin and Abraham Lincoln.

Donna Engel, a Minooka chemistry teacher and vice president of the association, said the organization of the state's science teachers

**Accelerator Update****Feb. 25-27**

- Two stores provided 36 hours and 17 minutes of luminosity
- TeV experts conduct many studies
- Store 5934 hits second highest with luminosity of 286.4E30

[Read the Current Accelerator Update](#)

[Read the Early Bird Report](#)

[View the Tevatron Luminosity Charts](#)

**Announcements****[Have a safe day!](#)****Children's Summer Day Camp registration due**

Registration forms for the on site day camp for children of Fermilab employees are due by 5 p. m. today. The camp for ages 7 through 12 consists of three separate three-week sessions: session I: June 16 - July 3, session II: July 7- July 25, session III: July 28 - Aug. 15. The camp, held in the lower level of the Kuhn Barn in the village, runs from 7:30 a.m. to 5:30 p.m. You may choose any or all of the sessions. The fee for each day camp session is \$295 per camper. A \$125 deposit per session per camper must accompany the registration form. Registrations will be accepted at the Recreation Office, M.S. 126. Applications go into a lottery held on Feb. 29. An information booklet and registration form can be found on the Recreation Website.

**Apple Leopard presentation March 4**

A presentation from Apple titled "Leopard for the Scientist" will be held on March 4, from 8-11 a.m. in Wilson Hall One West. The presentation will include the latest UNIX features and demonstrations in Leopard, Leopard tools for writing and optimizing code, Intel compiler and innovative solutions for scientists from Apple, developers and scientists. Apple Open Source's Ernie Prabhakar, Intel's Steve Lionel, and Ron Ustach and Tim White from the Apple Government Team will present. [More information](#)

**IDES representative on-site Friday**

An IDES representative will be on-site in the Wilson Hall Atrium Dining Room (SW corner) Fridays through the end of March. Small group meetings will occur every 30 minutes, beginning at 11 a.m. and ending with a final meeting at 1 p.m. If you are beginning your furlough week, please fill out a benefit



will begin a year-long initiative in 2009 to raise awareness of science in students, teachers, the community, and the business world.

Local industry leaders from ExxonMobil, Fermi National Accelerator Laboratory, and Lyondell/Basell also attended and gave input on how they were willing to help with the year of celebration.

.....Susan Dahl of Fermilab said her research industry is reaching out to teachers and students right now, and has many resources available for both.

"This is part of our heritage," she said of Fermilab. "We want to make that connection between those who are doing science and those who are teaching it."...

[Read more](#)

application on-site. You may also apply for benefits [online](#) or at your local IDES office the week you are on furlough. Please contact [Heather Sidman](#) x3326 or [Jeannelle Smith](#) x4367 with questions.

### **Applications due for 2008 CERN-Fermilab Hadron Collider school**

Applications for the 2008 CERN-Fermilab Hadron Collider Physics Summer School are due Feb. 29. The school takes place August 12-22, 2008, at Fermilab, and focuses on training advanced graduate students and young postdocs. Both theorists and experimentalists should apply. The list of lectures and lecturers has been posted at the [school Web site](#). [Click here](#) for more information.

### **International Folk Dance Feb. 28**

International Folk Dancing will meet Thursday, Feb. 28, at Kuhn Barn on the Fermilab site. Dancing begins at 7:30 p.m. with teaching and children's dances earlier in the evening and request dancing later on. Newcomers are welcome and you do not need to come with a partner. Get more information at 630-584-0825 or 630-840-8194 or [folkdance@fnal.gov](mailto:folkdance@fnal.gov).

### **[Additional Activities](#)**