# Fermilab Today

Thursday, May 18, 2006

## Calendar

**Thursday, May 18**

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

Speaker: M. Stephanov, University of Illinois, Chicago

Title: AdS/QCD

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

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

Speaker: D. Moehs, Fermilab

Title: Ion Source Choices, an H-Source for the High Intensity Neutrino Source

**Friday, May 19**

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

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

Speaker: M. Carena, Fermilab Title: Probing Supersymmetry Through Higgs, Flavor Violation and Dark Matter Searches

**For links to events, click here.**

## Weather

Rain **65º/41º**

Extended Forecast

Weather at Fermilab

## Current Security Status

Secon Level 3

## Wilson Hall Cafe

## Laser Lab team wins Industrial Hygiene Award

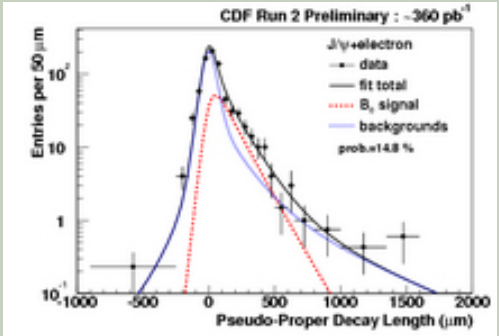
Members of the Laser Lab team and those who nominated them.* The award, given last week by Fermilab's Industrial Hygiene Subcommittee, is for work done in 2004. (Click on image for larger version.)

The Fermi NICADD Photoinjector Laboratory Laser Lab team members recently won the 2004 Industrial Hygiene Employee of the Year Award, which recognizes Fermilab employees for exceptional management of a hazardous substance or system. "Safety is always the first priority," said Jamie Santucci, member of the Laser Lab team.

The team, led by Helen Edwards, received the award last week for its work on developing a class IV laser facilities lab as part of R&D for the ILC. Class IV is the most dangerous type of laser, used for drilling and welding-or, in this case, knocking electrons off a photocathode and launching them into an accelerating cavity. In their set-up, the laser light shoots through a pair of crystals, each of which cuts its wavelength in half. What begins as infrared light-with a wavelength just longer than the human eye can see-exits the lab room as ultraviolet light, with a wavelength just shorter than we can

## Fermilab Result of the Week

## Beauty and Charm are fleeting




The lifetime distributions of 783 $B_c$ candidates decaying to an electron plus a J/Psi particle (charm + anticharm particle). Signal and background contributions are shown as red and blue lines, respectively. A signal of 238 events gives a lifetime of 0.463 +-0.069 +- 0.036 $10^{-12}$ seconds, about a third of the lifetime of the more common B mesons composed of a beauty quark and a light (up, down, or strange) quark.

The $B_c$ meson is a particle possessing both charm and beauty. Formed from a beauty and a charm quark, the $B_c$ is expected to be the heaviest meson with distinct quarks. A key question for physicists is how long this unstable meson will exist before decaying. The answer will provide insight as to how heavy quarks can form together and how they interact. The $B_c$ meson was discovered by CDF in 1998 with only 20 $B_c$ signal events, not enough to measure the lifetime. Run 2 at the Tevatron is the only place which can provide the opportunity for this lifetime measurement.

CDF has recorded the largest number of $B_c$ events in the world, by taking advantage of its speedy online filtering system that selects events consistent with b meson decay by carefully tracking

**Thursday, May 18**

-Southwestern Chicken Tortilla
-Philly Style Cheese Steak
-Chicken Pot Pie
-Tomato Basil Chicken Parmesan
-Southwestern Turkey Wrap
-4 Cheese Pizza
-Marinated Grilled Chicken Caesar Salads

Wilson Hall Cafe Menu

## Chez Leon

**Thursday, May 18**

**Dinner**

-Fresh Mozzarella & Tomato Salad
-Garlic Shrimp w/Red Peppers & Wild Mushrooms
-Lemongrass Rice
-Brandi Flan

**Wednesday, May 24**

**Dessert Lunch**

-Cold Fruit Soup
-Assortment of Desserts
-Cold Lime Soufflé

Chez Leon Menu

Call x4598 to make your reservation.

## Search

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Send comments and suggestions to today@fnal.gov

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Hurricane Relief Page

Fermilab Today PDF Version

see. But although the laser is invisible to us, even indirect laser radiation can permanently damage workers' eyes.

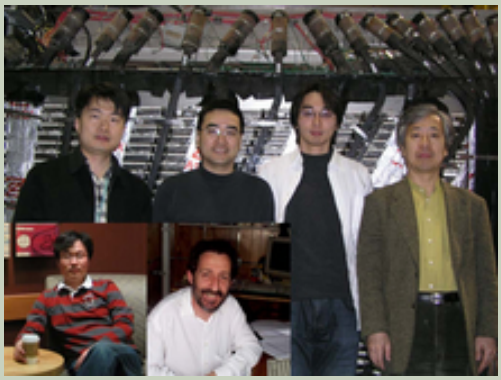
To prevent accidents, the Laser Lab team has worked several safety precautions into the system. For example, if an unauthorized person accidently opens the door to the lab while the laser is on, the laser shutters will automatically stop the beam. If the shutters do not close fast enough, a second level of safety cuts the power supply. Although the award is for their work in 2004, Santucci says, "our level of laser safety has been achieved through continuous awareness and work."

*--Jennifer Lauren Lee*

*Back row, left to right: Mike Bonkalski, ES&H; Paul Czarapata, AD Associate Division Head for Engineering; Roger Dixon, Head of Accelerator Division; Jed Brown, Associate Director for Operations Support; Helen Edwards, FNPL group leader; Dave Baird, ES&H. Bottom row, left to right: James Santucci and Ray Fliller, FNPL Laser Lab team members. Not pictured: Adrian Melissinos, who led the team from the University of Rochester that built the laser from scratch; Jianliang Li, who ran the laser lab during 2004; and team members Rodion Tikhoplav and Philippe Piot.

## DOE Review Poster Display

the particles in the silicon vertex detector and central tracker. The most recent Run-II $B_c$ lifetime measurement is obtained from events where the $B_c$ decays to an electron and another meson called a "J/Psi," which is a charm quark plus an anticharm quark. Using selection criteria based on this unique signature, CDF finds a $B_c$ signal of 238 events. The lifetime of the $B_c$ was measured to be $0.463 \pm 0.069 \pm 0.036\ 10^{-12}$ seconds, the most precise $B_c$ lifetime result to date. The precision of this result begins to reach the level needed to separate various theoretical models of quark interactions, and will improve as more Run 2 data is collected.



Members of the CDF team for this Physical Review Letters publication also made significant contributions to the Silicon Vertex Detector, Central Tracker, the Trigger system and the Time-of-Flight detector. From top to bottom, left to right: Intae Yu (SungKyunKwan University, Korea), Ting Miao (Fermilab), Masato Aoki (University of Tsukuba, Japan), Shinhong Kim (University of Tsukuba, Japan), Ilsung Cho (SungKyunKwan University, Korea) and Alberto Ruiz (IFCA, CSIC-University of Cantabria , Spain). Not shown: Bill Ashmanskas (Fermilab) and Jonas Rademacker (University of Oxford, United Kingdom).

**Result of the Week Archive**

## Science Grid This Week

Fermilab Result of the Week archive

Fermilab Safety Tip of the Week archive

Linear Collider News archive

Fermilab Today classifieds

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Each year, Fermilab researchers pull out the posterboard and think up colorful ways to summarize their research for the Annual DOE Program Review. This year's posters are on display now through May 22 on the 15th floor, and they provide an excellent overview of the research happening at Fermilab. If you can't get away from the desk, you may view a sampling of the 33 posters here.

## How big is big? Probing the conditions of the universe on the largest scales

*SDSS Press Release, May 15*

Since the 1970s, astronomers have discovered structures in the three-dimensional distribution of galaxies on ever larger scales, up to hundreds of millions of light years. Today, researchers from the Sloan Digital Sky Survey (SDSS-II) announced the first measurements of galactic structures more than a billion light years across. Read more...

## Fermilab featured in *Scientific American* Podcast yesterday

In a Podcast yesterday, *Scientific American* edtior Mark Alpert spoke to host Steve Mirsky about his experience visiting Fermilab and going inside the Tevatron. You can read a summary and listen to the podcast here.

## In the News

## Extending the Grid by 'EPIC' Proportions

EPIC meeting attendees gathered at RENCI headquarters. Image Courtesy Josh Coyle, Renaissance Computing Institute.

Success in the knowledge age requires cyberinfrastructure— computing resources, applications for research and learning, data repositories and tools for data analysis and long-distance collaboration.

**Read More**

## Announcements

**C++ Classes offered June 5**

On June 5, Fermilab will offer the first session of Accelerated C++: A Short Course in Practical Programming by Example. Course registration is now open. Course Announcement and Syllabus.

**Batavia Road entrance closed to cars and bicycles**

The Batavia Road entrance is closed for renovation now through Monday, May 22 at 4:00 p.m. During this time, the City of Warrenville will also be repaving roadways and carrying out other construction work along Batavia Road. Delays are expected to continue until early June, even after the entrance re-opens. Drivers and bicyclists should use Pine and Wilson Street entrances until the work is completed. Pine Street entrance hours are 6:00 a.m. to 8:00 p.m. for the general public and 24 hours a day, 7 days a week for employees. The Wilson Road entrance hours are 6:00 a.

## *New York Times*
## May 18, 2006:

**Renewing America's Commitment to Research in High-Energy Physics**

In October 2003, I gave an evening talk at the Fermi National Accelerator Laboratory in Batavia, Illinois. The subject was nature on the familiar scale, the kind embodied in the restored prairie on the Fermilab campus — some 1,200 acres of compass plant and rattlesnake master and other species. But it's impossible to visit a place like Fermilab without thinking about nature on another dimension, the subatomic one being studied in the Tevatron collider, which looks from the sky like an enormous, moated ring.

In the Tevatron, subatomic particles are accelerated to extremely high speeds and crashed into each other within a detector chamber. That afternoon, I clambered through the scaffolding around the detector chamber as scientists tried to explain to me what it all meant. To me it looked like an incomprehensible array of electronics several stories high. The detector's purpose is to capture a computerized image of the debris of each antiproton-proton collision. The particles that emerge — varieties of quarks and mesons, for instance — seem at first to have nothing to do with nature as we know it on the human scale.

**Read More**

m. to 6:00 p.m., Monday through Friday. For more information, contact Tom Prosapio at prosapio@fnal.gov

**Power Outage**

On Saturday, May 20, there will be a major power outage in Wilson Hall. As a result, Wilson Hall and Ramsey Auditorium will be closed from 7:00 a.m. to 5:00 p.m. If you must enter Wilson Hall or the Auditorium during this time, you will be asked to sign in at the security desk in the Wilson Hall atrium. Please note: emergency exit stairwells, elevators and exit signs will not illuminate during this time. Avoid using the elevator and use the North open stairwells in case of emergency.

**Upcoming Activities**