

## Calendar

Thursday, March 17

Happy St. Patrick's Day!

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

Speaker: C. Oleari, Universita Milano

Title: QCD Corrections to Higgs Boson

Production: Signal and Backgrounds

3:30 p.m. DIRECTOR'S COFFEE

BREAK - 2nd Flr X-Over

4:00 p.m. Accelerator Physics and

Technology Seminar - 1 West

Speaker: S. Schreiber, DESY

Title: TTF VUV FEL Commissioning

Friday, March 18

3:30 p.m. DIRECTOR'S COFFEE

BREAK - 2nd Flr X-Over

4:00 p.m. Joint Experimental

Theoretical Physics Seminar - 1 West

Speaker: D. Zieminska, Indiana

University

Title: Lifetime Difference and A Limit

on Mixing in the Bs System from

DZero

Sunday, March 20

2:30 p.m. Gallery Chamber Series - 2nd

Flr X-Over

Rembrandt Chamber Players

Tickets: \$15

## Weather



Chance Snow 43%/31%

[Extended Forecast](#)

[Weather at Fermilab](#)

## Current Security Status

## Flickering at Aspen East



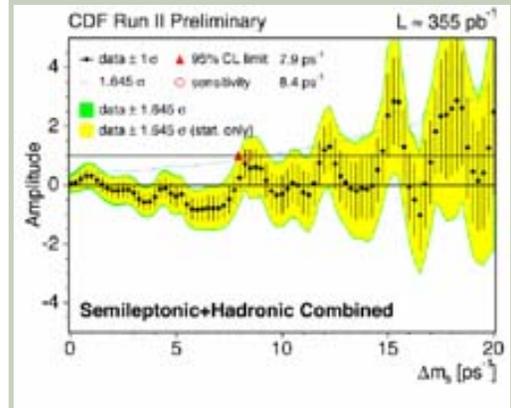
Aspen East in the Village. (Click on image for larger version.)

For some time now, housing employees and residents of the Aspen East Dorm Facility have reported an eerie, candle-like flickering of the lights. At times, the phenomenon seemed related to the operation of the copy machine. Were there ghostly apparitions? Was the house possessed?

FESS/Ops electrical supervisor Rich Bergquist and FESS electrical engineer Joe Pathiyil found that Aspen East was, indeed, possessed. But the culprits were the grounded neutral busses in satellite distribution panels and a compromised neutral connection to the main entry panel from Kuhn Barn. "There was never any danger," said Bergquist. "But it did take a lot of man hours to find and repair all of the problems." FESS/Ops electricians disconnected the incoming power lines from Kuhn Barn to Aspen East at both ends, then tied them together to create a circuit that could then be tested. Aspen East power distribution panels were also inspected. "The neutral bus at the

## Fermilab Result of the Week

### Studying Matter-AntiMatter Transformations with CDF



This figure represents an "amplitude scan" of  $\Delta m_s$  using CDF data. The data are evaluated in steps of  $\Delta m_s$ . If the data are not compatible with the particular value of  $\Delta m_s$ , the expected amplitude (the vertical axis) is zero. The yellow bands represent the allowed range of the amplitude; the value of  $\Delta m_s$  where the band first crosses  $A=1$  corresponds to the lower limit on  $\Delta m_s$ . (Click on image for larger version.)

Mesons are combinations of a quark and an anti-quark bound by the strong interaction. Due to the electroweak force, neutral mesons such as the  $K^0$  (strange anti-quark and down quark), the  $B^0$  (bottom anti-quark and down quark) and the  $B_s^0$  (bottom anti-quark and strange quark) can transform from particle to antiparticle, e.g.,  $B_s^0$  to anti- $B_s^0$  (bottom quark and strange anti-quark). These transformations are referred to as "flavor oscillations" since the quarks become antiquarks and vice-versa. Measuring the frequency of these oscillations provides information on fundamental parameters in the Standard Model of particle physics and may provide a window to finding physics beyond the Standard Model.

## [Secou Level 3](#)

### Wilson Hall Cafe

Thursday, March 17

Tomato Florentine Soup

Grilled Chicken Cordon Bleu Sandwich  
\$4.75

Chimichangas \$3.75

Chicken Marsala \$3.75

Maryland Crab Salad \$4.75

Italian Sausage Calzones \$3.25

SW Chicken Salad with Roasted Corn  
Salsa \$4.75

The Wilson Hall Cafe now accepts  
Visa, Master Card, Discover and  
American Express at Cash Register #1.

### [Wilson Hall Cafe Menu](#)

[Chez Leon](#) is now open. Call x4512 to  
make your reservation.

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main entry panel is always grounded," Pathiyil said. "But grounding neutral busses at satellite panels sets up a circulating current within the system, causing low voltage current to flow down the outside of conduits." Pathiyil and Bergquist completed the exorcism by removing the bonding screws from the satellite panel neutrals.

This left only the question of the copy machine, which did turn out to be "unbalanced." The problem was solved by redistributing loads from one of the satellite panels, and the lights now burn brightly at Aspen East.

- Greg Gilbert

### Correction

Yesterday's INFN/Fermilab press release listed the wrong affiliation for Alessio Notari, who is from McGill University.

### Accelerator Update

March 14- March 16

- During this 48 hour period operations established two stores that provided the experiments with approximately 41 hours and 33 minutes of luminosity  
- Linac suffered RF and Buncher trips

[Read the Current Accelerator Update](#)

[Read the Early Bird Report](#)

[View the Tevatron Luminosity Charts](#)

### In the News

While flavor oscillations were established in the  $K^0$  system in 1960, the first evidence for oscillations in the  $B^0$  system was reported by the ARGUS Collaboration in 1987. The oscillation frequency,  $\Delta m_d$ , has since been measured with a precision approaching 1%. It is known that  $B^0_s$  mesons oscillate, and since the late 80's, attempts to measure the oscillation frequency,  $\Delta m_s$ , have failed. The measurement of  $\Delta m_s$  is one of the most sought after results at the Tevatron.

The measurement of  $B^0_s$  flavor oscillations requires exquisite experimental precision to reconstruct the  $B^0_s$  meson decays, to measure their decay time, and to determine whether the meson that decayed was produced as a  $B^0_s$  or an anti- $B^0_s$ . It is one of the most complex analyses undertaken by CDF, and it includes many supporting measurements such as B meson lifetimes and  $B^0$  flavor oscillations. More than 70 physicists (including 24 Ph. D. students) from 25 institutions are involved, making this one of the largest coordinated analysis efforts in CDF's history. The result is shown in the figure above;  $B^0_s$  flavor oscillations are not observed, and a lower limit on  $\Delta m_s > 7.9$  trillion hertz is established. This means that a  $B^0_s$  meson transforms to a anti- $B^0_s$  in less than 0.4 trillionths of a second, at least sixteen times faster than  $B^0$  oscillations. The expected value of  $\Delta m_s$  in the Standard Model is about 20 trillion hertz. The current CDF result is not the most restrictive lower limit on  $\Delta m_s$ , yet with planned improvements and more data to come,

## FYI: AIP Bulletin of Science Policy News, March 16, 2005

### AIP Endorses 7% Increase in DOE Office of Science Budget

The American Institute of Physics and two of its Member Societies have endorsed the Energy Sciences Coalition's FY 2006 Funding Statement for the Department of Energy's Office of Science. The coalition statement calls for a 7%, or \$250 million, increase in the Office of Science's budget over the current year.

The Bush Administration's request that was sent to Congress in February recommended a 2.0% reduction in the total Department of Energy budget. The Office of Science's budget would be cut further: a 3.8% reduction was proposed. Under the President's request, the budget for the Office of Science for the fiscal year starting this October 1 would be 2.0% lower than it was for FY 2004.

[read more](#)

this first result demonstrates that CDF is on the road to measure  $\Delta m_s$  during Run II.



Pictured here are 11 of the 24 students actively involved in this  $B_s$  mixing analysis. A complete list of the authors is [available online](#). (Click on images for larger version.)

[Result of the Week Archive](#)

### Announcements

#### International Folk Dancing

International Folk Dancing has now moved back to the Kuhn Barn on Fermilab's site and will celebrate St. Patrick's Day with some Irish dances on Thursday, March 17. Dancing begins at 7:30 p.m. with teaching earlier in the evening and request dancing later on. Newcomers are welcome and you do not need to come with a partner. Info at 630-584-0825 or 630-840-8194 or [folkdance@fnal.gov](mailto:folkdance@fnal.gov).

[Upcoming Activities](#)