

Calendar

Thursday, November 3

11:00 - Academic Lecture Series -
1 West

Speaker: C. Quigg, Fermilab

Title: The Electroweak Theory and Higgs
Physics – Lecture 2

2:30 - Theoretical Physics Seminar -
Curia II

Speaker: A. Birkedal, University of
California, Santa Cruz

Title: Measuring Dark Matter at Colliders

3:30 p.m. Director's Coffee Break -
2nd Flr X-Over

4:00 Accelerator Physics and Technology
Seminar - 1 West

Speakers: S. Lackey, C. Briegel, D.
Nicklaus, J. Patrick - Fermilab

Title: Summary of the International
Conference on Accelerator and Large
Experimental Physics Control Systems
(ICALEPCS 2005)

Friday, November 4

3:30 p.m. Director's Coffee Break - 2nd
Flr X-Over

4:00 Joint Experimental Theoretical
Physics Seminar - 1 West

Speaker: D. Mohapatra, Virginia Tech

Title: Radiative B-decays at BELLE

8:00 p.m. Fermilab Lecture Series
Dr. Steven Levitt, University of Chicago
presents: Using Data to Catch Cheaters

Weather



Breezy 72°/52°

[Extended Forecast](#)

[Weather at Fermilab](#)

Community Group Discusses International Linear Collider



Members of the Community Task Force,
pictured above at a March, 2004 meeting,
met Tuesday. (Click image for larger version.)

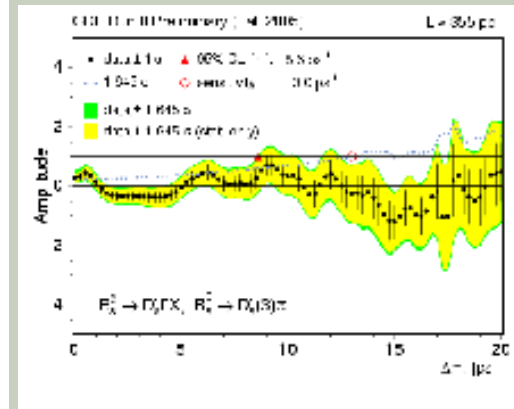
Members of the Fermilab Community
Task Force on Public Participation met
Tuesday evening to discuss issues
related to the proposed International
Linear Collider, and its potential impact on
Fermilab and the community. Doug Sarno
of The Perspectives Group, the
Alexandria, Va. consulting firm that
guided the CTF efforts throughout 2004,
is acting as facilitator.

"There are many social issues to discuss,
as we work on how to develop a really
robust plan for public participation with
the ILC process," Sarno said at the
group's organizational meeting, held
Tuesday night, November 1, in Wilson
Hall.

The Department of Energy has said that if
the ILC were to be built in the U.S., the
Northern Illinois area around Fermilab
would be the preferred location. Sites in
Asia and Europe will also be considered
by the ILC Global Design Effort. Vic
Kuchler, head of Fermilab's Facilities
Engineering Services Section, described
the geological requirements of a machine

Fermilab Result of the Week

Pushing the World Limit: B Flavor Oscillations at CDF



This figure represents the new "amplitude
scan" of the mixing frequency, Delta ms, of
CDF data. For each value of Delta ms
(horizontal axis) an amplitude value A
(vertical axis) is determined. The expected
value of A is one if the data are compatible
with the given mixing frequency and zero
otherwise. The yellow bands represent the
allowed range of the amplitude; the value of
Delta ms where the band first crosses A=1
corresponds to the lower limit on Delta ms.
The dotted line indicates the expected limit
or sensitivity. (Click on image for larger
version.)

B_s^0 mesons consist of a strange quark
and an anti-beauty quark. The weak
nuclear force can cause B_s^0 mesons to
transform to their antiparticle and back.
These transformations are called "flavor
oscillations" or "mixing," and the
frequency of these oscillations is referred
to as "Delta ms", which is the
experimentally measured mass difference
between the light and heavy states of the
 B_s^0 meson.

There is convincing experimental
evidence that B_s^0 mesons undergo flavor
oscillations, but the frequency of these
oscillations is so fast that it has not yet
been possible to observe them directly.
Instead it has been possible to establish a

Current Security Status

[Secou Level 3](#)

Wilson Hall Cafe

Thursday, October 27

- 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

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

[Wilson Hall Cafe Menu](#)

Chez Leon

Thursday, November 3

Dinner

BOOKED

Wednesday, November 9

Lunch

- Calzone w/Prociutto
- Roasted Pepper, Basil & Three Cheeses
- Cesar Salad
- Espresso Coupe

[Chez Leon Menu](#)

Call x4512 to make your reservation.

Search

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Info

that would be super-sensitive to vibration. Bob Kephart, newly-appointed program director for the ILC at Fermilab, offered the science case for the ILC, which could address some of the most compelling open questions in science today, including extra dimensions, dark energy and dark matter.

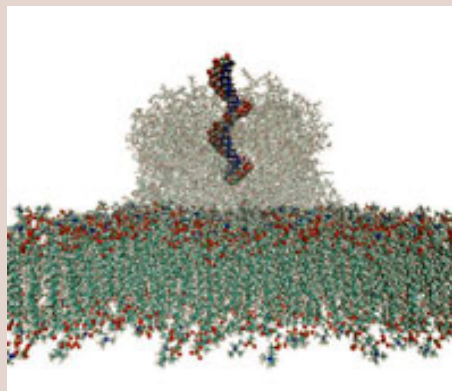
Fermilab director Pier Oddone stressed the need for early public involvement with the ILC, while pointing to the collider's lengthy timeline. "The earliest date for breaking ground would be around 2012," Oddone said. "So it's not as if the bulldozers are waiting around the corner."

The CTF subcommittee meets again on Tuesday, November 15, at 6 p.m. in Wilson Hall. Meetings are open to the public. [More on the Community Task Force.](#)

—Mike Perricone

Science Grid This Week

SPICE-ing Up DNA Simulations



A single-strand DNA entering an alpha hemolysin protein pore. Image courtesy of SPICE

Scientists in the UK combine grid computing, high-speed networks, supercomputers and three-dimensional visualization technology to study how biomolecules move through cell and

lower limit on Delta ms; it is 95 percent probable that the B^0_s flavor oscillation frequency is larger than this lower limit. Establishing larger lower limits further restricts possible values of Delta ms and represents important progress in our understanding of B^0_s flavor oscillations. The measurement of Delta ms is one of the flagship analyses of Run II of the Tevatron at Fermilab because it provides important unique information about the weak interaction and may lead to the indirect discovery of new fundamental particles.

CDF has presented its [first Run II analysis in Spring 2005](#), which set a lower limit on Delta ms. Using the same data set that was used in this first analysis, CDF physicists implemented several refinements in the analysis technique, and on October 25, CDF revealed [a much improved Run II result](#) on B^0_s mixing at the PANIC Conference in Santa Fe, NM. This completes a second round of the analysis, one of the largest analysis efforts in CDF, with contributions from more than 70 physicists (including 26 graduate students) from 26 institutions. More information about this analysis effort can be found in [a recent result of the week](#).

The improvement in the analysis is reflected in the increase in the expected lower limit or "sensitivity" on the mixing frequency from the data, which has grown from 8.4 trillion Hertz to 13.0 trillion Hertz. The CDF sensitivity is now the second largest in the world from a single experiment. More important, when combined with measurements from other experiments, the combined expected limit increases significantly, from 18.1 trillion

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nuclear membranes. Translocation, the process through which a DNA or mRNA fragment moves from the outside of a membrane to the inside through a pore, is important for several scientific disciplines and technological applications.

"Geneticists, biologists and physicists all study this problem," said Shantenu Jha, a physicist from University College London (UCL). "Geneticists are interested in how the DNA unravels, and physicists are interested in translocation as an energy problem. It has technical applications as well—nanotechnology and materials science researchers want to use artificial pores very similar to the natural pore we're investigating to screen thousands of DNA fragments against a test fragment and see what matches."

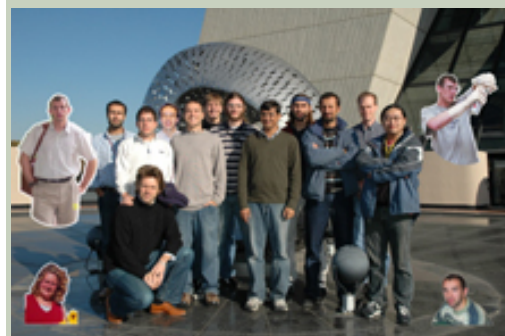
Jha collaborates in the SPICE— Simulated Pore Interactive Computing Environment—project, which uses the RealityGrid Steering Library and associated middleware to run interactive simulations on the UK's National Grid Service and TeraGrid in the U.S. The simulations are unique; instead of a one-way flow of simulation data from supercomputer to remote visualization resource, the scientist also uses the visualization to steer the simulation. The bi-directional data flow is made more challenging when the simulation and visualization resources are located hundreds, or even thousands, of miles away.

[Read More](#)

In the News

Hertz to 19.6 trillion Hertz.

Physicists at CDF are continuing to squeeze the data and further major improvements are anticipated. The Tevatron is producing world record luminosity and new data are now available, which will more than double the statistics of the data set used for the current analysis. With these further improvements and additional data, CDF will explore values of Δm_s that may reveal the first signs of a direct observation.



Shown are some members of the B^0_s analysis team. Top, left to right: Ilya Kravchenko (MIT), Nuno Leonardo (MIT), Jonatan Piedra (Paris U.), Manfred Paulini (CMU), Jeff Miles (MIT), Ivan Furic (Chicago U.), Alberto Belloni (MIT), Vivek Twari (CMU), Boris Iyutin (MIT), Sandro De Cecco (Rome U.), Mathew Jones (Purdue U.), Masa Tanaka (ANL), Denis Usynin (Penn U.); bottom: Stephie Menzemer (Cantabria U.), Christoph Paus (MIT), Guillermo Gomez-Ceballos (Cantabria U.). Click [here](#) for a full list of names and institutions. (Click image for larger version.)

[Result of the Week Archive](#)

[Accelerator Update](#)

Fermilab Media Advisory, November 2, 2005:

**Media invited to attend Pierre Auger
Observatory Celebration, to be held
November 9-12, 2005 in Malargüe,
Argentina**

BATAVIA, Illinois-Scientists of the Pierre Auger Observatory, a project to study the highest-energy cosmic rays, will hold a celebration to mark the first physics results and progress on the nearly-completed detector array in Malargüe, Argentina, from November 9 to November 12, 2005. Media representatives wishing to attend should make arrangements as soon as possible, and should begin by contacting Rosa Pacheco at the Pierre Auger Southern Observatory (+54 2627) 471 562, email:

augercelebration@auger.org.ar. Sign-up through the Web site is also available at www.interactions.org/auger/.

The Pierre Auger Observatory is exploring the mystery of high-energy cosmic rays--charged particles showering the earth at energies above 10^{19} electron volts, about 10 million times higher than the world's highest-energy particle accelerator, the Tevatron at Fermilab. There is no scientific consensus on the origin of these highest-energy cosmic rays. To witness these extremely rare events, the observatory is constructing an array of 1600 detectors spread over 3000 square kilometers in Argentina's Mendoza Province, just east of the Andes Mountains. Each detector contains 3000 gallons of water. The detector array covers an area approximately the size of the state of Rhode Island in the United States. The Observatory collaboration includes more than 370 scientists and

October 31 - November 2

- Two stores provided 34 hours and 38 minutes of luminosity.
- Store 4477 set a Record Luminosity of 164.17E30.
- ICW leak at CDF.
- Store 4477 quenched on termination.

[Read the Current Accelerator Update](#)

[Read the Early Bird Report](#)

[View the Tevatron Luminosity Charts](#)

Announcements

Veteran's Day Celebration

A Veteran's Day celebration will be held from 11 a.m. to 1 p.m. on Friday, November 11 at Kuhn Barn. Admission is \$7. Roast beef sandwiches, mostacoli and drinks will be provided. Money must be turned in by November 4 to one of the following people: Joseph Morgan, x4181 or x4182; Greg Gilbert, x6835; Karl Williams, x3043; or Michael Frett, x4663.

Bench Dedication

In memory of Sue Mendelsohn, NALWO is presenting a bench to the lab, which has been placed outside the Lederman Center. Mendelsohn, an employee of the Lederman Center and longtime secretary of NALWO, Fermilab's women's organization, died last year on November 12 after a valiant fight with cancer. The bench was made of teak and white oak by Sue's husband, Michael Church, of the Accelerator Division.

Anyone who would like to remember Sue and her contributions to the lab, NALWO and the community, is invited to an informal ceremony to dedicate this special bench. It will be held in front of the Lederman Center, at 1 p.m. on Tuesday, November 8. In case of rain, the

engineers from 60 institutions in 16 countries, and the construction cost of approximately \$50 million has been shared by the participating countries.

[Read More](#)

dedication will be postponed to 1 p.m. Thursday, November 10.

International Folk Dancing

IFD will meet tonight 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 always welcome and you do not need to come with a partner. Info at 630-584-0825 or 630-840-8194 or folkdance@fnal.gov.

[Upcoming Activities](#)