

## Calendar

### Monday, March 6

**2:30 p.m.** Particle Astrophysics Seminar

- Curia II

Speaker: H-W. Chen, University of Chicago

Title: Large-Scale Gaseous Structure Around Galaxies

3:30 p.m. DIRECTOR'S COFFEE

BREAK - 2nd Flr X-Over

4:00 p.m. All Experimenters' Meeting - Curia II

Special Topics: Retiring Off-Site Legacy Magnetic Tapes; HFM/LARP Magnet R&D

\*\*\* Announcement \*\*\*

On Monday and Tuesday, March 6 and 7, there will be a workshop on Long Baseline Neutrino Experiments

[more information](#)

### Tuesday, March 7

**3:30 p.m.** DIRECTOR'S COFFEE

BREAK - 2nd Flr X-Over

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

Speaker: R. Tikhoplav, University of California, Los Angeles

Title: Low Emittance Electron Beam Studies

## Weather



Snow Showers 35°/21°

[Extended Forecast](#)

[Weather at Fermilab](#)

## Current Security Status

## DZero: First Inverse Femtobarn Results



Guennadi Borissov, of Lancaster University, presented DZero's B physics results with  $1 \text{ fb}^{-1}$  at Friday's Joint Experimental Theoretical Physics Seminar. (Click image for larger version.)

*In June 2005, Fermilab celebrated one inverse femtobarn ( $1 \text{ fb}^{-1}$ ) of integrated luminosity in Collider Run II, a milestone for the number of collisions produced by the Tevatron. Last Friday, at the lab's weekly "wine and cheese" seminar, Guennadi Borissov, of Lancaster University, showed the first Run II results with an inverse femtobarn. On behalf of the DZero collaboration, Borissov presented the results of three analyses during the Joint Experimental Theoretical Physics seminar. Details of the measurements of excited B mesons and a matter-antimatter asymmetry are described in this special edition of the Result of the Week.*

For certain particle processes that are difficult to reconstruct, a large dataset provides the opportunity to find and reconstruct a large enough sample to measure particular particle properties. A large dataset can also provide much higher precision for a variety of

## Safety Tip of the Week

### Shutdown Safety



As part of the ongoing shutdown, Keith Dillow of Accelerator Division's Mechanical Support Department places his LOTO lock on the group lockout box in the Accelerator Control Room.

Fermilab's 2006 accelerator shutdown has been underway for a week. As usual, much work needs to be done and schedules are tight. Accelerator Division again employed careful planning to guide the activities of some 600 workers, about half of whom will need to access underground accelerator enclosures sometime during the shutdown. According to Senior Safety Officer John Anderson, electricity is a hazard that deserves special attention. We will be doing a lot of electrical work during the shutdown. LOTO (Lock-Out/Tag-Out) will be a major tool for dealing with this hazard.

In his [pre-shutdown talk](#), division head Roger Dixon described his expectations regarding ES&H. Key among these is his view of the importance of safety. If the job must be done, then we must find a safe way to do it. Roger also provided a list of actions that have proven effective in preventing injuries. Here are some that

[Secon Level 3](#)**Wilson Hall Cafe****Monday, March 6**

- Minestrone
- Chicken & Mushroom Cheese Steak
- Baked Chicken Enchiladas
- Pot Roast
- BLT Ranch Wrap
- Assorted Slice Pizza
- Kung Pao Chicken

The Wilson Hall Cafe accepts Visa, Master Card, Discover and American Express.

[Wilson Hall Cafe Menu](#)

**Chez Leon****Wednesday, March 8****Lunch**

- Calzone of Spicy Sausage
- Roasted Red Peppers and Three Cheeses
- Caesar Salad
- Hazelnut Cake w/Coffee Ice Cream and Bittersweet Mocha Cake

**Thursday, March 9****Dinner**

- Pasta Carbonados
- Stuffed Filet of Sole w/Crabmeat
- Sauteed Spinach w/Lemon Garlic Pine Nuts
- Salad of Field Greens, Pear & Shaved Parmesan
- Pecan Rum Cake

[Chez Leon Menu](#)

Call x4512 to make your reservation.

**Search****Search the Fermilab Today Archive**

measurements. Examples are the studies of B mesons and their display of a matter-antimatter asymmetry.

Particles called B mesons are composed of an anti-bottom-quark and a second quark of different type. When the second quark is light--such as an up, down, or strange quark--the two-particle system behaves somewhat like an atom, with the heavier anti-b-quark playing the role of the nucleus at the atom's center, and the lighter quark the role of the electron orbiting the nucleus.

Just as an atom can be "excited," B mesons can form new states when the light quark whirls around its partner. The additional "orbital" energy results in a heavier, excited state. Examining the decay products of such two-particle systems, DZero physicists have been able to measure for the first time several properties of two excited states of a down quark orbiting the "anti-b."

Analyzing 1 fb<sup>-1</sup>, the results reveal themselves as bumps in the first graphic (see below) and are denoted as B<sup>\*\*</sup>.

Analysis of the 1 fb<sup>-1</sup> dataset has also led to the first direct observation of a strange quark spinning around an anti-b in an orbitally excited state, a composite state known as B<sub>s</sub><sup>\*\*</sup> (appearing as a bump in the second graphic below). The measurements of the properties of particles containing quarks in excited configurations increase our understanding of how quarks bind in every-day matter as well.

One of the most intriguing questions in modern science is "Why do we live in a universe that is overwhelmingly dominated by matter?" The observed

can be applied to any work situation.

- Plan your work--think about the hazards.
- Use the correct tools for the job.
- Make certain that you have the proper training for the task at hand.
- Wear appropriate personnel protective clothing and equipment.
- Maintain an awareness of where you are and what you are doing. Be aware of what others are doing around you.
- Ask for help in lifting.

**[Safety Tip of the Week Archive](#)****Accelerator Update****February 24 - March 3**

- Machine installations, upgrades, and repairs begin.

[Read the Current Accelerator Update](#)

[Read the Early Bird Report](#)

[View the Tevatron Luminosity Charts](#)

**In the News**

***New York Times,***  
**March 2, 2006:**  
**Owen Chamberlain, 85, Dies;**  
**Discovered Antiproton**

Owen Chamberlain, who shared a Nobel Prize for discovering the antiproton, opening a glimpse into the strange world of antimatter, whose mysteries tantalize scientists to this day, died Tuesday at his home in Berkeley, Calif. He was 85.

The cause was complications of Parkinson's disease, said his wife, Senta Pugh Chamberlain.

## Info

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

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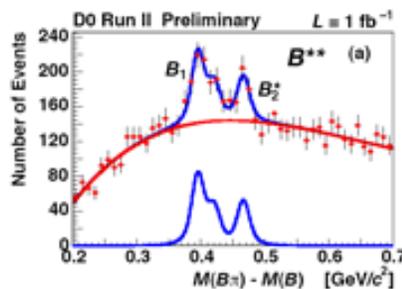
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matter-antimatter asymmetry in the universe requires slight differences between the mechanisms responsible for the creation, the time evolution, or the decay of sub-atomic particles. Known as CP violation, the asymmetry has clearly been established in both B mesons and kaons (mesons in which the bottom quark is replaced by a strange quark), however the CP asymmetries observed in the past are far too small to explain the matter dominance of our universe.

The DZero experiment is searching for a new form of CP violation in events where two B mesons are produced and both decay to muons. Searching for these di-muon events in the  $1 \text{ fb}^{-1}$  dataset, DZero has measured the CP violation parameter  $\epsilon_{\text{B}}$  with unprecedented precision, reaching sensitivities on the order of one tenth of one percent. The result is consistent with zero, indicating that this process provides no extra means of CP violation. The search for extra sources of CP violation continues!



**Above:** The mass difference between the  $B^+\pi^+$  and  $B^-\pi^-$  systems for  $B^{**}$  candidates is analog to the energy difference between excited atomic states. The peaks indicate excited  $B_1$  and  $B_2^*$  resonances. (Click image for larger version.)

Dr. Chamberlain, an emeritus professor of physics at the University of California, Berkeley, had been determined enough to attend a departmental physics colloquium as recently as Monday, Mrs. Chamberlain said.

The antiproton, discovered in 1955 by a team led by Dr. Chamberlain and another Berkeley physicist, Emilio Segrè, was the second bit of antimatter that physicists had created in what were then referred to as atom smashers.

[Read More](#) (Registration Required)

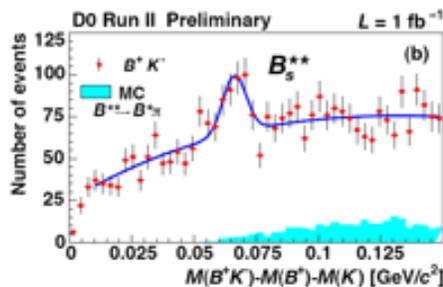
## Announcements

### Particle Physics Workshop, Live from Italy

The 20th anniversary of the annual particle physics workshop, Les Rencontres de Physique de la Vallée d'Aoste, will be held at La Thuile, from March 5 to 11. A special anniversary session will run from 10:00 to 11:30 a.m. and from 4:00 to 6:00 p.m. (local Italian time) today, March 6. The distinguished speakers will be Rocky Kolb, Carlo Rubbia, Roberto Petronzio, Samuel C.C. Ting, Sheldon Glashow and Alvaro De Rujula. The titles of their talks can be found in the preliminary program at the conference [website](#). Streaming video will be available [here](#).

### Blackhawks Hockey Discounts

Enjoy the thrills of Blackhawks Hockey with your family & co-workers at 50 percent off regular ticket prices! Order your 300-Level tickets now for \$20, \$12.50 or \$7.50! Tickets are normally \$40, \$25.00, and \$15.00. Tickets available for the following games: March 15 at 7:30 p.m., March 29 at 7:30 p.m.,



**Above:** The missing mass  $m(B^- K^+) - m(B^-) - m(K^+)$  for  $B_s^{**}$  candidates. The excess indicates the  $B_s^{*2}$  resonance. Analyzing  $1 \text{ fb}^{-1}$  of data has allowed DZero to make the most precise measurements of the properties of the  $B_s^{**}$  states and make the first direct observation of the  $B_s^{*2}$  resonance. (Click image for larger version.)

and April 16 at 6:00 p.m. Order forms are available in the Recreation Office or at [the recreation website](#).

### **Fertile Ground Artist Reception**

You and your families are invited to the next artist reception in the Fermilab Art Gallery, (Wilson Hall 2nd floor) on March 10, 2006 from 5-7pm. The exhibit is "Fertile Ground" by Pam Allnutt. We hope to see you there.

### **Corporate Shopping Program at the Chicago Premium Outlets**

At Fermilab, you now have access to great shopping and big savings at the Chicago Premium Outlets by using your Fermilab ID card. Receive a free VIP Coupon Book during the month of March (a \$5.00 value worth hundreds of dollars of additional savings just by showing your Fermilab ID card); view the [Premium Outlet Website](#) to register and learn more about additional savings and events throughout the year.

### **Upcoming Activities**