

Calendar

Thursday, November 9

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

Speaker: D. Walker, University of Wisconsin, Madison

Title: Top Quark Pairs at High Invariant Mass -- A Model Independent Discriminator of New Physics at the LHC

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

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

Speaker: Z. Conway, Argonne National Laboratory/University of Illinois, Urbana-Champaign

Title: Electromagnetic and Mechanical Properties of Superconducting Spoke-Loaded Cavities

THERE WILL BE NO ALCPG ILC PHYSICS AND DETECTOR SEMINAR THIS WEEK

Friday, November 10

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

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

Speaker: F. Margaroli, INFN Bologna

Title: CDF's Top Mass and Cross Section Results in the All-Hadronic Decay Channel

8:00 p.m. Fermilab International Film Society - Auditorium

Le Dîner de cons (The Dinner Game)

Adults \$5

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

Fourth-grade scouts learn some college-level physics



Mary Hawthorne, in yellow, helps scouts earn science pins for their uniforms.

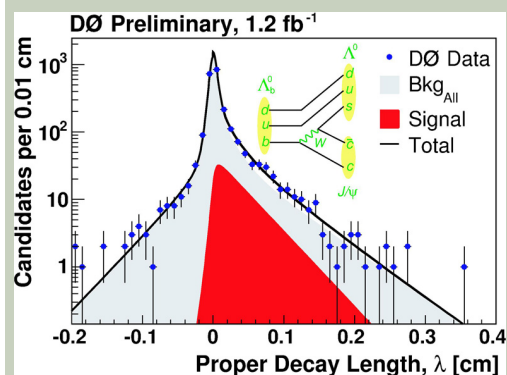
It's Friday at the Lederman Science Center, and docent Mary Hawthorne is placing a glass jar upside-down over a lit candle in a tin full of water. "What will happen?" she asks. The room is full of boy scouts, pumping their hands in the air to answer her question.

The fourth-grade St. Charles boy scout den is spending the afternoon with Hawthorne to earn science pins for their uniforms. Hawthorne is teaching them about the Bernoulli Effect, Newton's laws of motion, Pascal's law, and how hydraulics and electric fields work. In one of her many demonstrations, she shows how cold temperatures can enhance the field of a superconducting magnet--she allows a magnet to levitate over a piece of superconducting wire cooled in liquid nitrogen.

The scouts are really thinking about this. Their eyes are glued to Hawthorne, and they gasp when water spontaneously fills upside-down glass jars, small magnets hover inside copper tubes, and rubber balls crack into pieces after being dunked in liquid nitrogen. Scouts try to explain

Fermilab Result of the Week

The puzzle of a lifetime



Distribution of proper decay length for signal and background and fit for the average lifetime value.

Particle physicists make a living piecing together intricate puzzles of data and theoretical predictions. Usually, each new piece of the puzzle clarifies the picture being assembled. In the case of the Λ_b hadron, however, the picture seems to be getting fuzzier as measurements pour in. First observed more than a decade ago, the Λ_b vexes physicists because its measured properties disagree with careful predictions.

Hadrons are bound states of two or more quarks, and the Λ_b is the lightest three-quark hadron containing a b quark. It is believed that the heavy b-quark dominates the decay of any particle containing a b quark; therefore, any particle whose heaviest constituent quark is a b-quark should have the same lifetime. Actual measurements show lifetime differences between various b hadrons, indicating that the other, lighter, quarks also play a significant role in the decay process. Sophisticated calculations predict that the Λ_b baryon should have a shorter lifetime than almost all of the other

Weather



Mostly Sunny 61°/41°

[Extended Forecast](#)[Weather at Fermilab](#)

Current Security Status

Secou Level 3

Wilson Hall Cafe

Thursday, November 9

- Santa Fe Black Bean
- Sloppy Joe
- Stuffed Peppers
- Sauteed Liver and Onions
- Baked Ham and Swiss on a Ciabatta Roll
- Assorted Slice Pizza
- Crispy Fried Chicken Ranch Salad

[Wilson Hall Cafe Menu](#)

Chez Leon

Thursday, November 9

Dinner

- Caribbean Root Vegetable Soup
- Red Snapper Vesuvio
- Steamed Rice
- Green Beans & Red Onions
- Banana Walnut Spring Rolls w/Caramel Rum Sauce

Wednesday, November 15

Lunch

- Calzone of Bacon, Cheese & Cabbage
- Marinated Vegetable Salad
- Coffee-Chocolate Coupe

[Chez Leon Menu](#)

Call x4598 to make your reservation.

Search

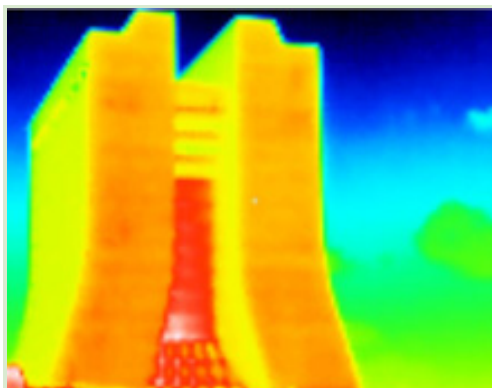
each outcome, sometimes using Newton's laws to justify their answer. "I like your balance between excitement and behavior," Hawthorne tells the group. "It's really working for me."

Classes like this have been going on at Fermilab for over two years. They are open to any den interested in earning a science pin. "We offer engineering pins, too," said Sue Sheehan, who also leads scout activity sessions at the Lederman Center. "In the engineering lesson, students get to make catapults."

--Siri Steiner

You can learn more about the scout program and other course offerings on the [education website](#).

Photo of the Day

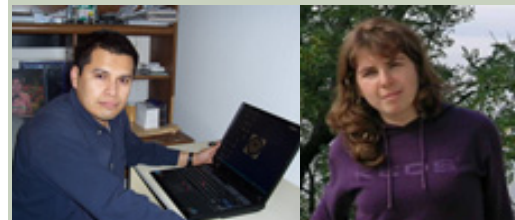


Getting hot in here: Jeff Larson of the proton source department took this picture from behind Wilson Hall with the Fluke IR imager. "It's a camera that can see IR light and accurately tell you what the temperature is on certain surfaces," he said.

In the News

b hadrons.

The DZero experiment has recently reconstructed about 174 complete Λ_b decays and has used this sample to measure its lifetime. The result of $(1.30 \pm 0.15) \times 10^{-12}$ seconds (less than the time it takes light to travel the width of a hair), is one of the most precise measurements of the Λ_b lifetime to date. It confirms earlier shorter lifetime results from other experiments, but is considerably shorter than a recent similar measurement reported by the CDF collaboration. Therefore the level of agreement between the data and theory remains open. It is widely expected that new analysis techniques and additional Tevatron data will shed more light on the problem. For now, the Λ_b remains the puzzle of a lifetime.



Above: Eduard de la Cruz Burelo (Univ. Michigan) and Natalia Panikashvili (Technion, Michigan visitor) contributed to this analysis.

Below: The muon algorithm group at DZero provides a crucial contribution to all analyses that rely upon good-quality muon identification. From left, top row: Raimund Stroehmer, Philippe Calfayan, Thomas Gadfort, Michel Eads, Boris Tuchming. Bottom row: Marion Arthaud, Frederic Deliot, Mark Owen, Linda Stutte, Andrzej Zieminski.



[Result of the Week Archive](#)

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USA Today, WonderQuest November 8, 2006:

Photon on a drunk walk

Q: How many years does it take for heat generated in the sun's core to reach its outer layer, the photosphere? (KS, Kuala Lumpur, Malaysia)

A: Asking how long photons take to migrate to the sun's surface can start a fight. Some solar physicists say 17,000 years, others 40,000, some 170,000, still others 1,000,000 years. It's a fairly tricky question, since the sun's core — where a photon starts — is a bad place to make much progress.

Let's follow a photon from its birth in the thermonuclear furnace at the sun's center, across 525,000 kilometers (more than the distance from Earth to the Moon) to the convective shell, and then follow the heat transfer to the sun's surface.

The sun's core is a hellish place. Gravity squeezes inward, compressing matter to densities unlike any matter found on Earth — about eight times the density of gold. Furthermore, the center sizzles at a temperature (27 million degrees Fahrenheit) hot enough to get two positively-charged hydrogen nuclei (protons) moving fast enough to collide together with enough energy to overcome their mutually repulsive electrical force. At 27 million degrees those guys smack together hard enough to fuse into a heavy hydrogen atom, and release an anti-matter electron (positron) and a neutrino (a massless, chargeless particle, moving at light speed).

[Read More](#)

Accelerator Update

November 6 - 8

- One store provided 20 hours and 26 minutes of luminosity
- 400 MeV Debuncher cavity temperature problems
- Recyclers loses 100.0E10 antiprotons

[Read the Current Accelerator Update](#)

[Read the Early Bird Report](#)

[View the Tevatron Luminosity Charts](#)

Announcements

Entertainment Book Sale in the Atrium

Would you like to save money on restaurants, stores and entertainment? Entertainment discount books will be sold in the Atrium Wednesday, November 15, and Thursday, November 16, from 11:30 a.m. until 1:00 p.m. Cash, checks, Visa and MasterCard will be accepted. You can also buy the books anytime during business hours in the Recreation Office.

[Upcoming Activities](#)