

Calendar

Thursday, Jan. 22
THERE WILL BE NO
PHYSICS AND DETECTOR
SEMINAR THIS WEEK
2:30 p.m.

[Theoretical Physics Seminar](#) -
Curia II
Speaker: Alexander Mitov,
State University of New York,
Stony Brook

Title: Top-Pair Production at
Hadron Colliders
3:30 p.m.

DIRECTOR'S COFFEE
BREAK - 2nd Flr X-Over
THERE WILL BE NO
ACCELERATOR PHYSICS
AND TECHNOLOGY
SERMINAR TODAY

Friday, Jan. 23

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

[Joint Experimental-Theoretical
Physics Seminar](#) - One West
Speaker: Marc Hohlfeld,
University of Bonn

Title: SUSY Searches in Tri-
lepton Final States
7 p.m.

Gallery Lecture - One West
Speakers: Laurel Ross, The
Field Museum; Rod Walton
and Tom Peterson, Fermilab

Title: Chicago Wilderness 101
8 p.m.

[Fermilab International Film
Society](#) - Auditorium

Tickets: Adults \$5
Title: [The Story of Qiuju](#)

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

Weather

Special Announcement

Secretary of Energy Steve Chu to speak at noon today

Secretary of Energy Steve Chu will address the national laboratories and the Department of Energy via satellite at noon today. Fermilab will broadcast his remarks in Ramsey Auditorium beginning at noon CST.

Feature

Open house opens minds to science

About 3,500 guests, many of them children, accepted Fermilab's invitation to bring their questions and curiosity to Fermilab's Family Open House on Saturday.

"This is primarily for kids," said Spencer Pasero, an education program leader at Fermilab. "We want to let them have some fun and learn some science."

Docents and volunteers with Fermilab's Education Office led children in hands-on experiments and crafts in Wilson Hall. Guests also watched demonstrations about the physics of static electricity or spinning tops or the amusing properties of liquid nitrogen.

"We try to tie everything we're doing into the lab," Pasero said. At the Open House, he demonstrated how a particle accelerator works by using magnets to accelerate steel ball bearings around a ring to smash a walnut.

Physicists stationed on the 15th floor of Wilson Hall took on the most complicated questions parents and kids brought to the Open House.

Fermilab scientist Herman White said some parents asked about the benefits of particle physics research. But the most common question from both kids and adults was: "What do you do here?"

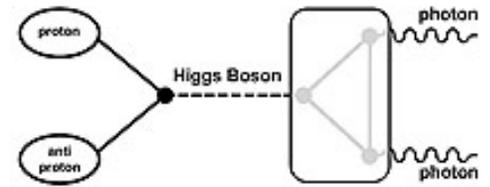
In giving kid-friendly answers, you have to take a chance sometimes, and explain something that might seem too complicated



A girl participates in a hands-on acceleration experiment at the Fermilab Family Open House on Saturday, Jan. 17.

Fermilab Result of the Week

Shedding light on the Higgs Boson



Protons and antiprotons are made to collide in the Tevatron. The Standard Model predicts that occasionally Higgs bosons that can decay into two photons. The light gray box illustrates the theory that the Higgs boson first decays into heavy subatomic particles that subsequently annihilate each other, resulting in a distinct two-photon final state.

Particle physicists from around the world are engaged in a frantic race. The finish line for this race is the discovery of the Higgs boson, which is believed to be the source of mass for all fundamental subatomic particles.

DZero physicists have recently announced their newest results in the search for this elusive particle. Since the mass of the Higgs boson is unknown, scientists search for it over a range of possible masses. Because scientists believe the Higgs boson interacts most strongly with the heaviest particles possible, typical searches for it at the Tevatron concentrate on decays into the very heavy W & Z bosons or the slightly less heavy bottom quark. However, sometimes these and other heavy daughters of the Higgs boson can annihilate each other, leaving only two massless photons in their place. The DZero experiment's calorimeter detects and measures these particles. This is the first search for these photon signatures at the Tevatron.

The Standard Model predicts that the decay of a Higgs boson into two photons is very rare (one time in 500), yet useful because photons are very distinct and well measured. In addition, some theories that incorporate physical processes beyond those of the Standard Model suggest a higher fraction of Higgs bosons decaying into photons. This measurement provides strong constraints on these theories.

 Mostly sunny
34°/25°

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

[Current Security Status](#)

[Secon Level 3](#)

[Wilson Hall Cafe](#)

Thursday, Jan. 22
- Tomato Florentine
- *Pork BBQ sandwich
- Pasta primavera
- Smart cuisine: chicken marsala
- Smoked turkey melt
- Assorted sliced pizza
- SW chicken salad w/roasted corn salsa

*Carb restricted alternative

[Wilson Hall Cafe menu](#)

[Chez Leon](#)

Thursday, Jan. 22
Dinner
Closed

Wednesday, Jan. 28
Lunch
- Sausage, roasted red pepper & three cheese calzone
- Caesar salad
- Hazelnut cake w/bittersweet chocolate sauce

[Chez Leon menu](#)

Call x3524 to make your reservation.

[Archives](#)

[Fermilab Today](#)

[Result of the Week](#)

[Safety Tip of the Week](#)

[ILC NewsLine](#)

[Info](#)

for a child to comprehend, White said. "They may not understand everything, but you can engage their enthusiasm."

Perhaps the seeds planted on Saturday will blossom into an interest in the pursuit of scientific knowledge for children like 6-year-old Sophia Ciatti.

Sophia isn't sure what she wants to be when she grows up, but she said has liked science since she was a baby.

Sophia's dad, Stephen, a mechanical engineer at Argonne National Laboratory, said he appreciated the opportunity to encourage Sophia's interest.

"She's very bright," he said. "These are the sorts of things I want to make sure she sees."

-- Kathryn Grim



A family at the Fermilab Family Open House on Saturday, Jan. 17, digs into balls of clay with paperclips. The activity demonstrated that you do not need to see what you are looking for to identify it.

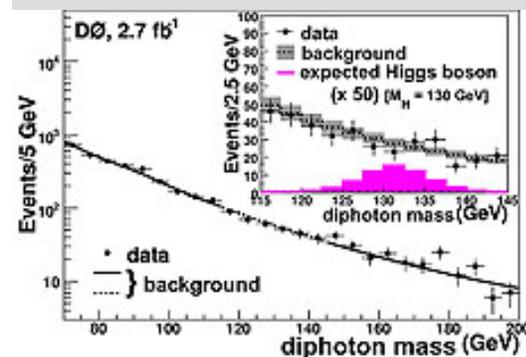
Announcement

C2ST present bioterrorism lecture Jan. 27

As the threat of an infectious disease outbreak becomes more pronounced, the need for the development of preventative vaccines and dynamic national policies becomes more urgent. On Jan. 27, learn about the latest research and evolving solutions from Olaf Schneewind, director of the Great Lakes Regional Center of Excellence, and a selected panel for Biodefense and Emerging Infectious Diseases Research during a lecture and panel discussion titled: "Bioterrorism, Pandemics and Vaccines." The event will take place in the Cindy Pritzker Auditorium at the Harold

This measurement found the same number of events with two photons as predicted by the Standard Model. From this observation, DZero scientists were able to set limits on the production of Higgs bosons that decay into two photons. While these limits are not quite as strong as searches for Higgs bosons using more common decays, this analysis adds important information for a subset of possible Higgs boson masses for which the other search methods were relatively weak. In addition, physicists at the Large Hadron Collider expect to focus on this type of decay to search for Higgs bosons. The experience gathered at the Tevatron will make their lives much easier and will highlight the collaborative nature of worldwide particle physics research.

[More technical information](#)



DZero scientists have measured the number of collisions in which two high-energy photons are produced. Inset: Data points are compared to the predicted background (dashed line and gray). The pink area shows an expected Higgs boson signal, multiplied by 50 to make it more visible. If a Higgs boson had been observed, scientists would have seen a "bump" on the falling background curve.



Xuebing Bu Liang Han Yanwen Liu
University of Science and Technology of China



Aurelio Juste Junjie Zhu
Fermilab SUNY Stony Brook

These physicists played a leading role in this analysis.

Fermilab Today is online at:
www.fnal.gov/today/

Send comments and suggestions to:
today@fnal.gov

Washington Library, 400 S. State St. Seating for this free program is limited. Register by [e-mail](#) or call Science Chicago at (773) 947-3150.

Photo of the Day

Completed 3.9GHz cavity string moved from clean room



From left: Marco Battistoni, Mark Chlebek and Brian Smith work to move the completed 3.9GHz cavity string out of the clean room at MP9 on Tuesday. The cavity string will undergo module assembly, and then will be shipped to DESY for use in the FLASH free-electron laser.

In the News

Nation's largest science meeting comes to Chicago Feb. 12-16

From *University of Chicago*,
 Jan. 20, 2009

Scores of researchers from the University of Chicago, Argonne National Laboratory and Fermi National Accelerator Laboratory are among the speakers who will address an array of crucial and timely issues at the 2009 Annual Meeting of the American Association for the Advancement of Science.

The theme "Our Planet and Its Life: Origins and Futures," recognizes 2009 as the 200th anniversary of Charles Darwin's birth and the publication of his landmark book on evolution, *The Origin of Species*. The meeting will convene from Feb. 12 to 16 at the Hyatt Regency Chicago and will include participants from 56 countries and hundreds of members of the national and international news media.

The University manages Argonne and co-manages Fermilab for the U.S. Department of Energy. Together, the three institutions attract more than \$1.3 billion dollars in annual research funding.



The DZero L2 group: These physicists monitor and maintain one of the critical trigger systems that ensure data flow. From left to right: Enrique Camacho, CINVESTAV, Mexico; Shannon Zelitch, University of Virginia; James Kraus, Michigan State University; Mandy Rominsky, University of Oklahoma; Joel Piper, Michigan State University; Emmanuel Munyangabe, University of Virginia. On the TV screen is Bob "Max Headroom" Hirosky, University of Virginia.

Accelerator Update

Jan. 19-21

- Two stores provided ~22 hours of luminosity
- Tevatron Electron Lens controls' problems cause TeV quenches
- MiniBooNE off due to sump pump failure
- Recycler has VSA problems

[Read the Current Accelerator Update](#)

[Read the Early Bird Report](#)

[View the Tevatron Luminosity Charts](#)

Announcements

Latest Announcements

[International Folk Dancing, Jan. 22 at the Barn](#)

[Bulgarian Dance Workshop, Feb. 12](#)

[Recreation Office Meetings](#)

[Have a safe day!](#)

[Intermediate / Advanced Python Programming - Jan. 27 - 29](#)

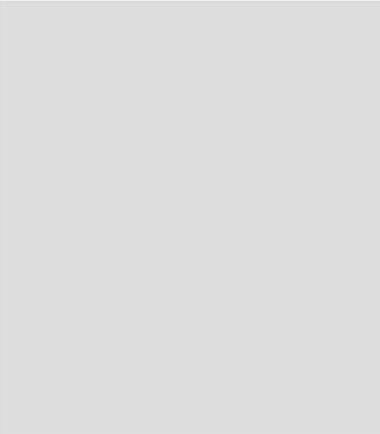
[NALWO Brown Bag Lunch - "Women as Classic: From BC to AD"](#)

[ACU bill pay demonstration Jan. 29](#)

[Outlook 2007 New Features classes scheduled Feb. 3 and 26](#)

[Conflict Management & Negotiation Skills class Feb.3](#)

[PowerPoint 2007: New Features](#)



[Read more](#)

[class Feb. 3](#)

[Facilitating Meetings That Work
class Feb. 4](#)

[Word 2007: New Features class Feb.
4](#)

[Excel 2007: New Features class
being offered Feb. 4](#)

[Interpersonal Communication Skills
class being offered Feb. 5](#)