

Calendar

Thursday, Feb. 19
11 a.m.

[Computing Techniques](#)

[Seminar](#) - FCC2A

Speaker: Douglas Thain,
University of Notre Dame
Title: Programming Multicore
Clouds Using High Level
Abstractions

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

[Theoretical Physics Seminar](#) -

Curia II

Speaker: Darren Forde,
University of California, Los
Angeles/ SLAC National
Accelerator Laboratory

Title: Automating One-Loop
Amplitudes for the LHC
3:30 p.m.

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

[Accelerator Physics and
Technology Seminar](#) - One
West

Speaker: Sandor Feher,
Fermilab
Title: Experience with the
Commissioning of the LHC
Superconducting Magnets

Friday, Feb. 20
3:30 p.m.

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

[Joint Experimental-Theoretical
Physics Seminar](#) - One West

Speaker: Daniel M. Kaplan,
Illinois Institute of Technology
Title: New Experiments with
Antiprotons

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

Weather

From *symmetrybreaking*

After 15 years, CMS crystals ready for prime time



A technician works on crystals for the CMS detector's electromagnetic calorimeter at CERN. *Image courtesy of CERN.*

A year may sound like a long time to shut down an experiment.

But it's all relative to researchers working on the Compact Muon Solenoid detector, which will study the results of particle collisions in the Large Hadron Collider.

Physicists guided proton beams in a complete loop around the LHC for the first time in September 2008. But an electrical problem brought operations to a halt, and the LHC is not scheduled to start up again until September 2009.

That's nothing compared to the time it took the CMS collaboration to obtain the lead tungstate scintillating crystals they needed to build the detector's electromagnetic calorimeter—15 years.

They began working on the crystals just after the fall of the Soviet Union and finally collected the complete set about a year ago.

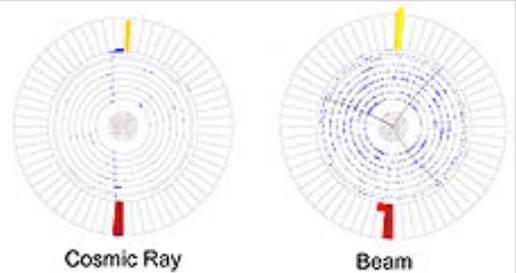
The Soviet military began developing the crystals, possibly for use in lasers, said CMS Collaboration Board Chair Dan Green. But after the fall of the Soviet Union, they shared their research with CMS physicists.

"Only about a handful (of the crystals) existed," said CMS Spokesman Jim Virdee at a presentation at the AAAS conference in Chicago. "We needed about 75,000 of them."

-- Kathryn Grim

Fermilab Result of the Week

Standing on tiptoes



Beam and cosmic ray initiated events can be distinguished by the signature seen in the tracking system. In a cosmic ray event, a single vertical track (as evidenced by the blue dots) indicates the passage of a single cosmic ray muon.

An event in which a photon and a Z boson was created is shown with a single (red) energy deposition in the electromagnetic calorimeter and (yellow) missing energy, which indicates neutrinos from the Z boson decay.

Recent particle physics research studies the rare and difficult to find. With the low hanging fruit picked clean, the time has come to stand on our tiptoes.

DZero physicists have done just that and [announced](#) the results of a search for a very rare process. They searched for events in which a Z boson and a photon are produced without anything else observed. While events like this have been observed before, these scientists searched for a special case, specifically when the Z boson decayed into two neutrinos. In earlier studies, the Z boson decayed into electrons or muons. Because neutrinos can traverse many billions of miles of solid lead without interacting, they pass through the detector entirely undetected. Thus, the scientists were looking for collisions in which a single photon was observed and nothing else.

Events like these are clean and very rare. They are easily mimicked by a detector malfunction or a stray cosmic ray. It is only because of the amazing amount of beam delivered by the Tevatron that scientists had any chance to view enough of these events to be certain of what they were observing. The certainty is 99.99997 percent.

While simply seeing something never before observed at a hadron collider is a triumph, DZero physicists went further and used this information to look for even rarer types of physics: an unusually heavy "virtual" photon or

Cloudy
23°/9°

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

[Current Security Status](#)

[Secon Level 3](#)

[Wilson Hall Cafe](#)

Thursday, Feb. 19
- 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, Feb. 19
Dinner
- Closed

Wednesday, Feb. 25
Lunch
- Lemon & Herb Tilapia
- Spinach Risotto
- Blueberry Pecan Crumb Cake

[Chez Leon menu](#)

Call x3524 to make your reservation.

[Archives](#)

[Fermilab Today](#)

[Result of the Week](#)

[Safety Tip of the Week](#)

[ILC NewsLine](#)

[Info](#)

[Read more](#)

Photo of the Day

DOE Office of Science tour



Last week, Dr. Laura Biven (right), science and technology advisor of the DOE Office of Science, visited Fermilab, with Sandra Geib, public affairs specialist for the DOE Chicago Office. Kurt Riesselmann (left), Fermilab Office of Communication, gave the visitors a tour of the 15th floor before they met with Fermilab scientists and members of the DOE Fermi Site Office.

Special Announcement

URA Thesis competition accepting admissions

Fermilab and the Universities Research Association invite submissions for the 12th annual URA Thesis award competition.

The award recognizes the most outstanding thesis related to work conducted at Fermilab or in collaboration with Fermilab scientists. The thesis must be completed in the 2008 calendar year. Nominations must be submitted to Steve Brice (sbrice@fnal.gov) by March 1 and should include at least two letters supporting the merits of the thesis you are nominating. At least one letter should be from a member of the thesis committee of the Ph.D.-granting institution.

The Thesis Awards Committee will select the winning thesis. Each thesis will be judged on clarity of presentation, originality and physics content. To qualify, the thesis must have been submitted as partial fulfillment of the Ph.D. requirements in the 2008 calendar year, be written in English, and submitted in the electronic form to the Fermilab Publications Office in accordance with Fermilab policy.

For more details, consult the [URA Thesis Award web site](#).

Z boson decaying into a Z boson and a photon. The Standard Model predicts that this process, called trilinear gauge boson couplings, is not possible. If some new physical phenomena allowed for this kind of couplings, DZero physicists would have seen more events than expected. Since they observed the number of events predicted by the Standard Model, these scientists were able to set some of the most stringent limits on this unexpected process occurring. Sometimes, standing on tiptoes is all you need to do to reach the prize.

-- Don Lincoln



Edgar Carrera
Florida State

Alexey
Ferapontov
Kansas State

Yurii Maravin (left)
Kansas State
Yuri Gershtein (right)
Rutgers University

These physicists played a leading role in this analysis.

DZero Trigger Board: A good trigger is crucial to any particle physics experiment. It decides what data is recorded and what is discarded. This board studies and sets the parameters that govern the current DZero suite of triggers.



Alexey
Ferapontov
Kansas State

Ike Hall
Michigan State

Rick Josik
Imperial College



Liang Li
UC, Riverside

Perry Kasper
Fermilab

Mark Williams
Lancaster University

Accelerator Update

Feb. 16-18

- Three stores provided ~42.75 hours of luminosity
- MI suffered vacuum burst
- One transfer of antiprotons lost due to timing problem
- On Thursday Pbar will install new target

[Read the Current Accelerator Update](#)

[Read the Early Bird Report](#)

[View the Tevatron Luminosity Charts](#)

Announcements

Fermilab Today

is online at:

www.fnal.gov/today/

Send comments and

suggestions to:

today@fnal.gov

In the News

Particle physicists set to invade the dark side

From *Ivan Semeniuk's Embedded Universe*, (a science blog) Feb. 13, 2009

Tom Diehl stretches his arms out and says, with relish: "It's the biggest phenomenon in the universe and we don't have a clue what it is!"

That pretty much sums up our situation with respect to dark energy, that mysterious thingamajig* that is thought to be causing the universe to expand at an ever-faster rate (as opposed to an ever-slower rate, like cosmologists once expected). When dark energy was first reported in 1998, it was soon recognized as the biggest discovery in a generation. But, as Diehl suggests, no one really knows very much about it.

This is not news. What is new is that some astronomical hardware tailor-made to study dark energy is now jumping off the drawing board and into reality. And it's happening at Fermilab, a place that is better known for looking at the smallest phenomena in the universe instead of the biggest.

Diehl himself is a living example of this shift. He's a high energy physicist associated with "DZero", one of the two main experiments at Fermilab that discovered the top quark in the early '90's. He's always liked astronomy (ever since he helped run a planetarium at his undergraduate college in Maine) but he didn't expect astronomy to reach out and grab him at Fermilab. Now, with the leading edge of collider physics shifting to the Large Hadron Collider in Europe, researchers at Fermilab are searching for new ways to stay in business, and dark energy certainly fits the bill.

[Read more](#)

Latest Announcements

[URA visiting Scholars applications due March 20](#)

[Have a safe day!](#)

[Monthly leave sheets due](#)

[Online Oxford English Dictionary now available site wide](#)

[Daycamp information and registration](#)

[Muscle Toning Classes](#)

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

[Special Seminar: Programming Multicore Clouds - Feb. 19](#)

[NALWO - Mardi Gras Potluck Dinner - Feb. 20](#)

[Discount Tickets: World's Toughest Rodeo Presents Toughest Cowboy - Feb. 21](#)

[NALWO - Brown Bag Lunch Program - "Australia: Travels in the Land Down Under" - Feb. 24](#)

[English Country Dancing, March 1](#)

[Introduction to LabVIEW class offered March 5](#)

[On-Site Housing - Summer 2009](#)

[NALWO - Adler Planetarium Trip - March 21](#)

[Child Care program offered - March 24](#)

[Kyuki Do Classes - March 30](#)

[Conflict Management & Negotiation Skills class offered Apr. 1](#)

[2009 Standard Mileage Reimbursement Rate](#)

[Additional Activities](#)

[Submit an announcement](#)

