

## Calendar

[Have a safe day!](#)

Thursday, March 4  
2:30 p.m.  
[Theoretical Physics Seminar](#) -  
Curia II  
Speaker: Matthias Neubert,  
University of Mainz  
Title: Effective Field-Theory  
Tools for the LHC  
3:30 p.m.  
DIRECTOR'S COFFEE  
BREAK - 2nd Flr X-Over  
THERE WILL BE NO  
ACCELERATOR PHYSICS  
AND TECHNOLOGY  
SEMINAR TODAY

Friday, March 5  
3:30 p.m.  
DIRECTOR'S COFFEE  
BREAK - 2nd Flr X-Over  
4 p.m.  
Joint Experimental-Theoretical  
Physics Seminar - One West  
Speaker: Mike Albrow,  
Fermilab  
Title: Central Exclusive  
Production: from Glueballs to  
Higgs Bosons

Saturday, March 6  
8 p.m.  
[Fermilab Arts Series](#) -  
Auditorium Performer: [Dervish](#)  
Tickets: \$29/\$15

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

[Upcoming conferences](#)

## Campaigns

[Take Five](#)

[Tune IT Up](#)

H1N1 Flu

## In Brief

### Computing update



Computing Division contractor Justin Wigg helps move racks of computers from the Feynman Computing Center.

Computing Division employees and contractors began moving racks of computers and disks from Feynman Computing Center to the Grid Computing Facility, located near the bison pasture in the former Wide Band experimental area, on Wednesday. FCC has been running at reduced power to prevent the recurrence of an electrical breaker trip that caused an outage [Feb. 17](#).

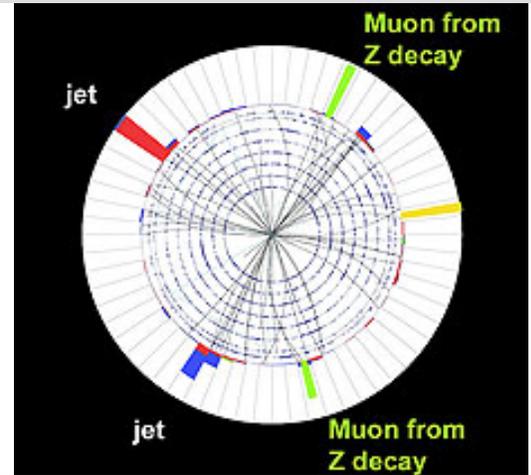
During this first phase of a process that will take several weeks, CD will start by moving machines that have not been powered on since the outage and preparing the Grid Computing Facility network to incorporate the new arrivals. CD will later need to turn off other machines, including some that help run scientific computing services and some that allow computer programmers to write and test software, in order to relocate them.

If you have questions about the availability or priority of systems or services, please contact the Fermilab Service Desk at x2345 or through its [Web site](#). The Computing Division will continue to provide updates about the recovery process and continued investigation into the outage.

From *symmetry breaking*

## Result of the Week

### Why is it so hard to find the Higgs boson?



Events containing a Z boson and at least two jets are excellent candidates for searching for Higgs bosons. Additional requirements improve the chances that the event actually contains a Higgs boson, but a thorough understanding of events of this kind is a crucial achievement for a successful Higgs boson search.

Fermilab Today subscribers have read articles on the importance of the Higgs boson. What they may not know is why it's so hard to find and what challenges experimenters face in their search.

Physicists don't know the mass of the Higgs boson. Scientists currently think that the Higgs might have a mass about 120-130 times heavier than a proton. If it does, it will decay most of the time into a pair of bottom quarks, which become jets, blasts of particles all travelling in the same direction. If this is the case, then looking for these decay particles should be easy - scientists can just search for pairs of jets containing bottom quarks. The problem is that ordinary physical processes can also make pairs of bottom quarks. This scenario is a couple of hundred million times more likely than the Higgs scenario.

So, physicists instead look for events in which a Higgs boson is made at the same time as a W or a Z boson. The Standard Model suggests that events like this are rarer than a Higgs boson produced alone. One nice bonus is that a W or a Z boson produced simultaneously with bottom quark pairs are just not created very often by ordinary physics processes. Indeed it is these extraordinary events in which the Tevatron is likely to discover the Higgs boson, if

For information about H1N1, visit Fermilab's flu information [site](#).

**Weather**

 Sunny  
40°/19°

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

**Current Security Status**

[Secou Level 3](#)

**Wilson Hall Cafe**

- Thursday, March 4
- Breakfast: Apple sticks
  - Santa Fe black bean soup
  - Steak tacos
  - Chicken Wellington
  - Chimichangas
  - Baked ham & Swiss on a ciabatta roll
  - Assorted sliced pizza
  - Crispy fried chicken salad

[Wilson Hall Cafe Menu](#)

**Chez Leon**

- Thursday, March 4
- Dinner
- Spinach & feta strudel
  - Herb-crusted lamb rib chops
  - Tomato risotto
  - Grilled vegetables
  - Lemon blueberry parfait

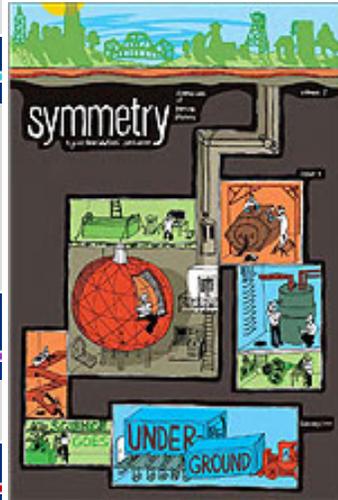
- Wednesday, March 10
- Lunch
- Vegetarian meal
  - Tex-Mex peppers
  - Latin fried rice
  - Vanilla flan w/ mango sauce

[Chez Leon Menu](#)

Call x3524 to make your reservation.

**Archives**

**Deep underground science: new issue of symmetry online**



The cover of *symmetry* magazine's underground issue, now online.

If you're a dark matter particle or a neutrino, it's a constant struggle to make yourself heard. The universe is an exceptionally noisy place, filled with a rain of cosmic-ray particles—mainly high-energy protons. One of the few places to escape the noise is deep underground, where the rock, earth, or water above shields against cosmic rays and allows other particles to tell whatever they are trying to say.

This issue of *symmetry* explores a range of particle physics and other sciences that can be only be performed deep underground.

Some highlights of the issue: plans for a [US deep underground science and engineering laboratory](#), taking clean equipment to an extreme in the [Enriched Xenon Observatory](#) in a salt deposit in New Mexico, the trial faced by the earthquake-stricken [Abruzzo region and the Gran Sasso laboratory](#) in Italy, the search for “[dark life](#)”, and a day in the life of the [Soudan underground lab in Minnesota](#).

-- *David Harris*

Photo of the Day

**New employees - Feb. 1**



Marco Trovato, PPD; Oleg Pronitchev, TD; Ana Mosquera, CPA; Vitaly Pronskikh, APC; Jesus Vizan, PPD.

Special Announcement

its mass is relatively low and, indeed, if the Higgs boson exists at all.

Even these special events, in which a W or Z boson is made with a couple of jets, occur more often than the desired Higgs and W or Z boson events. In fact, the ordinary types occur a couple of thousand times more than the kinds we want. That means we need to understand the ordinary physics extremely well, because a mistake of less than 0.1 percent in our ordinary physics calculations could mask a Higgs discovery.

DZero physicists have put an extraordinary amount of effort into studying ordinary events in which a Z boson is made along with jets, resulting in four publications. The most recent publication can be found [here](#). Without a precise understanding of physics processes that mimic the Higgs, discovering the elusive particle is essentially impossible. These publications bring our goal one step closer.

- *Don Lincoln*



<b>Ralf Bernhard</b> U. Freiburg Germany	<b>Gavin Hesketh</b> Northeastern U. & CERN	<b>Henrik Nilsen</b> U. Freiburg Germany
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These physicists were instrumental in these studies of events containing jets and Z bosons. This research explores the interplay of the strong and weak forces and has a significant impact on searches for Higgs bosons.



[Fermilab Today](#)[Result of the Week](#)[Safety Tip of the Week](#)[CMS Result of the Month](#)[User University Profiles](#)[ILC NewsLine](#)**Info**

Fermilab Today

is online at:

[www.fnal.gov/today/](http://www.fnal.gov/today/)

Send comments and suggestions to:

[today@fnal.gov](mailto:today@fnal.gov)Visit the Fermilab [home page](#)**Physicists: Sign up for the Adopt-a-Physicist program**

If you're a physicist, and you're willing to help encourage the next generation of potential physicists, then consider signing up to participate in the annual Adopt-a-Physicist program. Physicists participating in the program talk via online discussion forums with students about careers, education level, current projects and other topics for three weeks. The program lets students learn first-hand what people with physics degrees are doing.

To learn more about, or volunteer for, the Ask-a-Scientist program, visit the program [Web site](#).

**In the News****Fermilab says it will still be relevant, even as LHC begins work**

From the *Daily Herald*, March 3, 2010

When the Large Hadron Collider does the largest particle-smashing experiment ever conducted on Earth in a few weeks, it will seem to leave Fermilab in its dust.

The new 17-mile European collider is expected, on or around March 20, to send protons crashing into each other so fast that they create 7 teraelectron volts of energy - more than seven times the TeVs the Tevatron accelerator at Fermilab, until recently the world's most powerful, has produced.

But the 26-year-old, 4-mile Tevatron still has a few good years left - and data produced by several experiments conducted is very valuable for years to come, scientists and lab officials said Tuesday.

The data quality group is responsible for identifying and documenting variations in detector subsystem performance to help ensure that data used for physics-oriented analyses are of the appropriate quality. Left to right: Selcuk Cihangir, Fermilab; Jadranka Sekaric, University of Kansas; Ken Herner, University of Michigan; Lidija Zivkovic, Columbia University; Alan Jonckheere, Fermilab; Supriya Jain, SUNY, Buffalo; Norik Khalatyan Fermilab; Zhenyu Ye, Fermilab; Tom Diehl, Fermilab. Inset: Marj Corcoran, Rice University.

**Accelerator Update**

March 1-3

- Three stores provided ~37 hours of luminosity
- H<sup>-</sup> Source extractor repaired
- MTest line LCW leak fixed
- Accumulator extraction kicker high voltage cable repaired
- TeV conducted Proton-only study
- MTest T953 experiment will start up today

[Read the Current Accelerator Update](#)[Read the Early Bird Report](#)[View the Tevatron Luminosity Charts](#)**Announcements****Latest Announcements**[Public speaking for everyone March 4](#)[Yoga class begins March 9](#)[Calling all softball players](#)[Argentine Tango through March 31, student discount](#)[Barnstormers Delta Dart Night - March 10](#)[On-site housing for summer 2010 - March 8 deadline](#)[Employee discount offered at Batavia Rosati's](#)[Harlem Globetrotters special ticket price - April 15](#)[Qi Gong, Mindfulness and Tai Chi Easy for Stress Reduction](#)[International Folk Dancing, Thursday evenings at Kuhn Barn](#)[Hiring summer students for 2010](#)[Deadline for The University of Chicago](#)

[Read more](#)

In the News

## Fermilab continues to search for the building blocks of the universe

From *Medill Reports*, March 3, 2010

From above, the atom smasher ring at the Fermi National Accelerator Laboratory looks like a large, circular moat.

But, instead of a fortress at the center, bison roam in a snow-covered prairie. The animals graze just 25 feet above America's largest particle accelerator at Fermilab in Batavia.

Driving into Fermilab's 6,800-acre research park is like entering a parallel world. And it might as well be one. Experiments carried out here continue to push at the boundaries of our perception of the universe.

The accelerator, known as the Tevatron, lies beneath a circular river engineered at the laboratory and previously used for cooling the accelerator. The machine hurls protons around the 4-mile ring at the speed of light in opposite direction. When the beams of particles collide, subatomic debris explodes into detectors that analyze the fragments.

[Read more](#)[Tuition Remission Program - March 5](#)[English country dancing - March 7](#)[New Bible discussion starting March 9](#)[DreamWeaver CS3: Intro offered March 9 or March 16](#)[Interpersonal Communication Skills offered March 16](#)[Word 2007 Advanced class - March 16](#)[Facilitating Meetings That Work course offered March 17](#)[Adaptive Leadership: Coaching for Individual Differences class - March 9](#)[Art Gallery Talk - Virginia Broersma - March 10](#)[Excel Power User / Macros class - March 11](#)[Influence and Motivation: The Empowering Leader course - March 24](#)[PowerPoint 2007 Advanced course - March 25](#)[Excel Programming with VBA class - March 30 and April 1](#)[FRA Scholarship 2010](#)[Conflict Management and Negotiation Skills - March 3 and 10](#)[Adobe Acrobat Professional 9.0 Level 1 class - March 4](#)[Introduction to Argentine Tango Series of Classes - FREE](#)[Additional activities](#)[Submit an announcement](#)