

Calendar

[Have a safe day!](#)

Friday, Oct. 9

3:30 p.m.

DIRECTOR'S COFFEE BREAK - 2nd
Flr X-Over

4 p.m.

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

Speaker: Fred Olness, Southern
Methodist University

Title: QCD Puzzles, Predictions and
Prognosis: What can v do for you?

Monday, Oct. 12

2:30 p.m.

[Particle Astrophysics Seminar](#) - One
West

Speaker: Brian Yanny, Fermilab

Title: The SEGUE Survey: Constraints
on Dark Matter from the Kinematics of
a Quarter Million Stars

3:30 p.m.

DIRECTOR'S COFFEE BREAK 2nd
Flr X-Over

4 p.m.

All Experimenters' Meeting

Special Topic: ArgoNeuT Curia II

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

Campaigns

[Take Five](#)

[Tune IT Up](#)

Weather

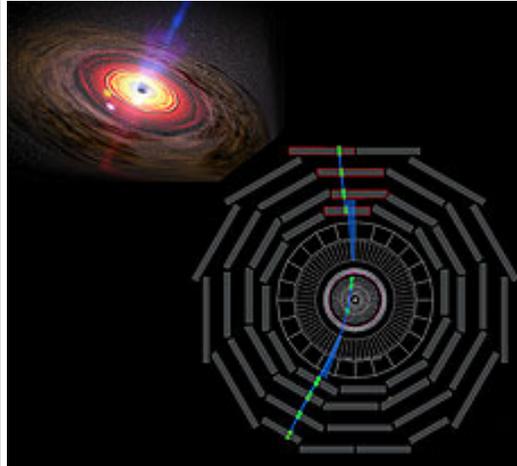
 Rain
53°/32°

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

Current Security Status

CMS Result of the Month

The great accelerator in the sky



Cosmic rays have many origins, including active black hole (artist's rendition upper left). Particles accelerated across the universe slam into the Earth, forming cosmic ray muons like the one shown passing through the CMS detector (lower right). These cosmic ray muons are invaluable tools for understanding a detector in its early stages.

Editor's note: *This is the first in a three-part series that describes the science done with data using cosmic rays in the CMS experiment.*

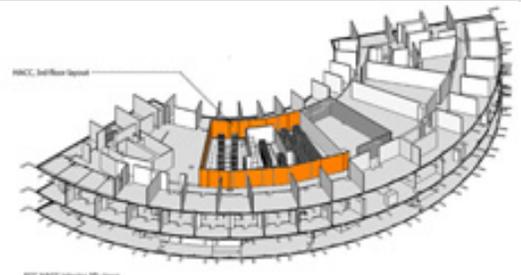
A long time ago, perhaps in a galaxy far, far, away, a star died, swallowed by a nearby ravenous black hole. This cosmic calamity tore the star apart, dragging most of it down into oblivion. But as the hot gas that composed the star spiraled downward, it encountered strong magnetic fields that rescued some of it and blasted it across the cosmos. As the relatively small surviving amount of now-ionized gas spread throughout the universe, each bit of plasma became more and more isolated - a single proton, a cosmic Flying Dutchman, doomed to travel alone forever. This and other ways of forming cosmic rays works like a giant accelerator, supplying particles that allow physicists to test their detectors.

A few of these cosmic rays happen to hit Earth. These particles hit atoms in the atmosphere and each collision results in more particles, which in turn hit more atoms. The single proton becomes hundreds or thousands of muons slicing downward toward the planet's surface, penetrating deeply into the Earth. Particle physicists are concerned mostly with these muons, some of which encounter a particle detector called CMS.

The same properties that allow muons to penetrate hundreds of feet of rock allow them to traverse CMS, leaving distinct signatures in the detector. The muons

Recovery Act Feature

Recovery Act funds new space to house computers



Contractors have begun building a high-availability computing center on the third floor of the Feynman Computing Center

The American Recovery and Reinvestment Act is funding a \$9.25 million expansion to the Fermilab computing infrastructure that keeps e-mail, Web servers and scientific computers running.

As the amount of computing power, storage and networking at Fermilab expands, capacity in Fermilab's only high-availability computing center is running out. The Recovery Act project will address a predicted capacity shortage by converting third-floor office space in the Feynman Computing Center to a new high-availability computing center.

Recovery Act funds were a good fit for the shovel-ready project, which was already in the engineering stages, said Gerry Bellendir, associate head for facilities and director of the project to upgrade the center.

"This expansion is critical to the scientific mission of the laboratory," Bellendir said.

The project's first stage, which is already underway, will add electrical capacity to the Feynman Computing Center for the expansion. A second phase of the project will replace the 20-year-old cooling system in the existing high-availability computing center

High availability requires engineers to build a facility that minimizes the amount of planned and unplanned downtime. High-availability servers at Fermilab have been available 99.999 percent of the time since January. That allows computer equipment to run without the risk of unexpected shutdowns that could damage equipment or lose data.

That high amount of uptime, nicknamed "five nines," is equivalent to the system being available for all but five minutes per year.

"If there were a power outage at the laboratory, someone

[Secon Level 3](#)

Wilson Hall Cafe

Friday, Oct. 9

- Chorizo burrito
- New England clam chowder
- Black and blue cheeseburger
- Tuna casserole
- Dijon meatballs over noodles
- Bistro chicken and provolone panini
- Assorted slices of pizza
- Carved top round of beef

[Wilson Hall Cafe menu](#)

Chez Leon

Wednesday, Oct. 14

Lunch

- Broiled tilapia with Thai coconut curry sauce
- Basmati rice
- Julienne of peppers
- Pear and ginger crisp

Thursday, Oct. 15

Dinner

- Spring mix salad with ruby grapefruit and toasted almonds
- Lamb chops with herb and olive crust
- Orange scented rice pilaf with fennel
- Vanilla ice cream with espresso-caramel sauce

[Chez Leon menu](#)

Call x3524 to make your reservation.

Archives

[Fermilab Today](#)

[Result of the Week](#)

[Safety Tip of the Week](#)

[User University Profiles](#)

[ILC NewsLine](#)

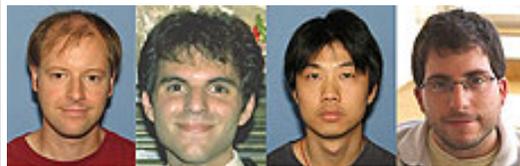
Info

can penetrate all detector systems and interact in predictable ways.

The CMS detector consists of 100 million detector elements. Each piece is carefully crafted and placed as accurately as possible. However, getting perfect knowledge of the position of each piece is a challenge. That is where muons from cosmic rays can help.

By knowing muon behavior and seeing these particles' signatures in the detector, CMS physicists can calibrate their system. By exploiting the huge data set, which consists of more than 1 billion muons, physicists can really investigate their equipment's performance. With help from the great accelerator in the sky, CMS physicists are ready for beam.

— *Don Lincoln*



Ingo Bloch Fermilab, T. Nicholas Kyriacos Univ. Florida, Chang Liu Purdue University, Jonatan Piedra Univ. Florida



Giovanni Petruccioli Univ. California San Diego, Jacob Ribnik Univ. California Santa Barbara, Nhan Tran Johns Hopkins University, Hwidong Yoo Purdue University

Graduate students and postdocs play a pivotal role in the commissioning of any detector. These young physicists have been heavily involved in understanding CMS' muon detection system.



Jim Pivarski of Texas A&M University was recently awarded a CMS Achievement Award for leadership in the alignment of the muon detector systems using beam data taken during the brief running period last fall.

In Brief

using computers in the high-availability computing center probably wouldn't know anything had happened," said Adam Walters, department head for facility operations in the Computing Division.

Maintaining high availability for the computers requires backup electrical generators, uninterruptable power supplies, redundant systems and regular audits to find and address possible weaknesses in the system.

— *Chris Knight*

Visit Fermilab's [Recovery Act Web site](#).

From Secretary of Energy Steven Chu

Save Award campaign -- One week left to submit your idea

As many of you know, President Obama launched the SAVE Award contest calling on federal employees and contractor employees to submit their ideas for innovative ways to reduce spending within our respective agencies.



Steven Chu

This is a reminder that the deadline is just one week away.

The winner will visit the White House and meet President Obama and have his or her savings initiative incorporated into the FY 2011 Budget.

Don't miss this opportunity to contribute your ideas to help reduce wasteful spending and make a government that is more efficient and effective.

All submissions are confidential, and can be made at www.SaveAward.gov.

The deadline is Wednesday, Oct. 14, and the winner will be announced in November. I urge you to participate, not only so the Department of Energy can win the award for the best participation, but also because this effort is an important way to give the American people a government that does more for less.

Thank you for your support of this effort and for participating in the President's SAVE Award contest.

Sincerely,
Steven Chu

P.S. For more information, watch [this video](#) from Office of Management and Budget Director Peter Orszag.

Announcements

Fermilab Today

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

Send comments and suggestions to:
today@fnal.gov

Visit the Fermilab
[home page](#)

East gate Q&A

Editor's Note: *The east gate will begin closing from 1 to 5 a.m. in mid- to late-November, as Fermilab Today [reported](#) in September. That article prompted questions from readers, which were answered in a followup [Q&A](#). Fermilab Today staff consulted FESS management and the project's manager for answers to additional frequently asked questions. Those questions and answers are below.*

Q: When will the new gate go into operation?

A: Sometime in mid- to late November.

Q: During what hours will it be closed?

A: From 1- 5 a.m.

Q: Why are we making the change?

A: When the Department of Energy took over Fermilab's Safeguards and Security contract, the funds for the contract were moved out of the laboratory's high energy physics budget and into a separate safeguards and Security budget. Congress has provided a limited amount of funding for Safeguard and Security activities. With inflation the costs have risen, but the budget has not.

To meet Department of Energy targets for small business contracts, in 2007 DOE took over the contract for laboratory security from Fermilab, deducting that cost from Fermilab's budget. Now DOE must make cuts in guards' hours to stay within the fixed Safeguards and Security operating budget. Besides closing the east gate between 1 - 5 a.m., DOE will also reduce the hours of guard staffing at the Wilson Hall front desk.

Q: How much will the gate and associated construction cost?

A: The gate is budgeted at \$472,000 from Safety and Security capital funding.

Q: What is the total cost per hour of a guard?

A: About \$27.

Q: How does this make economic sense?

A: The cost of the gate is paid from a different source from the guards' wages. The cost of the gate is paid from DOE's Safeguards and Security capital budget, not from its operating budget.

Q: Will essential personnel (experts called in for accelerator repairs, for example) on laboratory business be able to enter the East gate during the hours it is closed?

A: That is the laboratory's goal. Part of the contract for the new gate includes technology to operate it remotely, either from the Communications Center or by a hand-held device. If these systems and the gate can be shown to work reliably, essential personnel on laboratory

Latest Announcements

["Dealing With Difficult People" Lunch & Learn - Oct. 14](#)

[Barn dance - Oct. 11](#)

[Discount movie tickets available](#)

[Claim your bikes outside Wilson Hall](#)

[Buy discount Fright Fest tickets today](#)

[Scrapbooking Club open house - Oct. 12](#)

[NALWO seminar - An Introduction to Neurofeedback - Oct. 14](#)

[Fermilab Toastmaster can help you find your voice - Oct. 15](#)

[Thai Village restaurant discount](#)

[Fermilab hosts Workshop on Applications of High-Intensity Proton Accelerators - Oct. 19-21](#)

[Access 2007: Intro class - Oct. 20](#)

[Interpersonal Communication Skills class - Oct. 21](#)

[Buttered Rum performs at Fermilab Arts Series - Oct. 24](#)

[Director's Award nominations accepted until Oct. 26](#)

[Conflict Management and Negotiation Skills - Oct. 28, Nov. 11](#)

[Facilitating Meetings That Work - Nov. 4](#)

[Fred Garbo Inflatable Theatre at Fermilab Arts Series - Nov. 7](#)

[Process Piping \(ASME B31.3\) class offered in October and November](#)

["The Night Before Christmas Carol" at Fermilab Arts Series - Dec. 5](#)

[Scottish Country dancing Tuesday evenings at Kuhn village barn](#)

[Weight Watchers at Work coming](#)

business will be able to employ these devices to enter the gate during the hours it is closed.

Q: What about emergency vehicles?

A: Emergency vehicles have electronic devices (like the ones that turn traffic lights green) that can open the gate. If the gate system fails, emergency personnel may use more drastic means of opening the gate.

Q: If the gates can be opened reliably electronically, why not eliminate guards and use only automatic gates at all hours?

A: The Fermilab site is open to the public. With automatic gates, neighbors and visitors would not be able to enter. Besides checking ID's, guards at the gates greet visitors, provide information and answer questions.

[soon](#)

[Annual Enrollment now running](#)

[Mentors wanted for Diversity Office's FermiLINK program](#)

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