

## Calendar

### [Have a safe day!](#)

Thursday, Oct. 1  
2:30 p.m.

#### [Theoretical Physics Seminar](#) - Curia II

Speaker: Christopher Jackson, Argonne National Laboratory  
Title: Higgs in Space!

3:30 p.m.

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

Friday, Oct. 2

3:30 p.m.

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

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

Speaker: Fabrice Couderc, CEA Saclay  
Title: MSSM Higgs Boson Searches at DZero

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

## Campaigns

### [Take Five](#)

### [Tune IT Up](#)

## Weather



Chance of thunderstorms  
64°/51°

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

## Current Security Status

## Feature

### ROC helps staff longest-ever CMS cosmic run



Aron Soha, standing in Fermilab's Remote Operations Center, is joined by videolink with Fermilab's Kaori Maeshima and DESY's Andreas Meyer in CERN's CMS control room.

Crews taking shifts at Fermilab's Remote Operations Center helped scientists at CERN complete the longest-lasting cosmic run of the CMS detector to date.

Scientists staffing the ROC work in tandem with CMS crews thousands of miles away at CERN. Fermilab crews filled shifts from 8:30 a. m. to midnight from July 23 to Aug. 31, with the exception of a shift during a planned power outage, said Fermilab's Aron Soha, who is responsible for day-to-day functions at the ROC.

"Essentially we've taken shifts except when the lights were out," Soha said.

Even when the LHC is not running, cosmic rays that interact with the CMS detector can help scientists fine tune it, said Kaori Maeshima, U.S. CMS Remote Operations Coordinator.

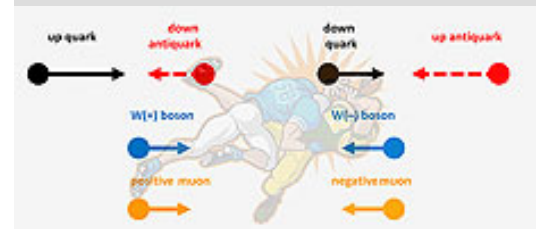
CMS operators surpassed one goal by recording 320 million cosmic events with full magnetic field and met their goal of 80 percent running efficiency.

"We were trying to get ready to take collision data," Maeshima said. "We have to be in sync when the beam collides."

For example, misaligned data streams from subsystems could produce inaccurate results, so experts working at the ROC, DESY's remote operations center and at CERN use

## Fermilab Result of the Week

### Up quark linebackers



Because the up quark carries more energy than the down quark, the muon from the W decay tends to move in the same direction as the up quark. It's like when a Chicago Bears linebacker hits a running back from the opposing team.

It is autumn in Chicago and that means falling leaves, crisp air and visions of championship Chicago Bears football. This dream requires a defense that can knock over opposing players. This week's article describes particle collisions that would meet even Mike Ditka's approval. Just as the Bears defense runs over their opponents, up quarks overpower down quarks in proton-antiproton collisions, as recently confirmed in a DZero collaboration measurement.

When protons and antiprotons collide, as they do at Fermilab, we are not studying the protons per se, but their constituents, the quarks and gluons. The dominant particles in a proton are three quarks: two up quarks and one down quark. Antiprotons are similar, containing two up and one down antiquark. The quarks each carry a fraction of the beam particle's energy. Physicists have previously observed that the up quarks typically carry more energy than the down quarks.

These quarks and antiquarks can interact in many ways, but important for today's column is the case when a quark from the proton interacts with an antiquark of a different type from the antiproton, for example, an up quark interacting with a down antiquark. These two particles can combine and form a W boson. Specifically, when an up quark combines with a down antiquark, it can make a positively-charged W boson. These W bosons can then decay into electrons or muons (essentially heavy electrons) with the same electrical charge, along with an associated neutrino.

Combining all this information, we see that an up quark and down antiquark can make positively-charged muons, while a down quark

[Secon Level 3](#)

**Wilson Hall Cafe**

- Thursday, Oct. 1
- Tomato florentine
  - Pork BBQ sandwich
  - Kielbasa and sauerkraut
  - Chicken marsala
  - Smoked turkey melt
  - Assorted slices of pizza
  - Southwest chicken salad with roasted corn salsa

[Wilson Hall Cafe Menu](#)

**Chez Leon**

- Thursday, Oct. 1
- Dinner
- Tomato soup with orange and cumin
  - Individual beef croustades with boursin and mushrooms
  - Baby spinach with scallions and lemon
  - Chocolate mousse

- Wednesday, Oct. 7
- Lunch
- White bean-rajas soup
  - Chicken and cheese quesadillas
  - Green salad
  - Tres leches cake

[Chez Leon Menu](#)

Call x3524 to make your reservation.

**Archives**

[Fermilab Today](#)

[Result of the Week](#)

[Safety Tip of the Week](#)

[CMS Result of the Month](#)

[User University Profiles](#)

[ILC NewsLine](#)

cosmic data to monitor detector timing.

CMS benefits from remote centers because shift takers can analyze data without worrying about minute-by-minute detector operations, said Andreas Meyer, CMS data quality monitoring coordinator and a staff physicist at DESY.

"At the moment at Fermilab and DESY, physicists can take more time to inspect the data and really make sure all aspects of the data are correct," Meyer said.

Fermilab and DESY physicists continue working to increase the usefulness of remote operations and improve central CMS data taking, even in early stages of the experiment. This includes developing monitoring tools, improving documentation and pioneering remote shift participation.

—Chris Knight

**University Profile**

**University of Arizona**



From left: Fermilab collaborators Elliott Cheu, Erich Varnes, Joel Steinberg, Dan Tompkins, John Rutherford and Ken Johns.

NAME:  
The University of Arizona

HOME TOWN: Tucson, AZ

MASCOT:  
Wilma and Wilbur Wildcat



Wilma and Wilbur Wildcat

SCHOOL COLORS:  
Cardinal red and navy blue

PARTICLE PHYSICS COLLABORATIONS:  
DZero and ATLAS

EXPERIMENTS AT FERMILAB:  
E-800, KTeV and DZero

SCIENTISTS AND STUDENTS AT FERMILAB:  
Two faculty and one post doctorate are

and an up antiquark can make the negatively-charged kind.

DZero scientists [studied](#) the production of positively and negatively charged muons. They found that the up quark linebackers are knocking the socks off the down quark running backs. Since up quarks carry more energy, it means that the W bosons produced more positively charged muons in the direction of the proton beam. At the same time, the negatively charged W bosons produced more muons of the same charge in the direction of the antiproton beam.

This measurement is more precise than the uncertainties in the theoretical predictions and scientists will use it to improve future predictions.

—Don Lincoln



John Backus-Meyers, Univ. Washington; Dave Cutts, Brown University; Thomas Geddoff, Columbia Univ.



Aran Garcia-Bellido, Univ. of Rochester; Andy Haas, Columbia Univ. / SLAC; David Khaitze, Brown University



Ron Ruchmanmacher, Fermilab; Gordon Walls, Univ. Washington; Yuhua Xia, Brown University / Fermilab

The DZero trigger system is quite complex. It consists of three distinct layers and culminates in the Level 3 (or L3) system. These physicists and engineers have been responsible for the smooth operation of this component of the trigger system, some of them over many years.



**Susan Blessing**

**Trang Hoang**

These two physicists from Florida State University were responsible for this measurement.

**Special Announcement**

## 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](#)

involved in Fermilab experiments. In the past, we had four faculty members, four post doctorate students, five graduate students and many undergraduates working on Fermilab experiments.

COLLABORATING AT FERMILAB SINCE: 1970s, when Mike Shupe and John Rutherford first came to the University of Arizona.

MAJOR CONTRIBUTIONS: Collaborators researched the direct CP violation in kaon decays and worked on the L2 cluster trigger for KTeV. We have participated in the precision measurement of the Omega minus magnetic moment and been the co-spokesperson for E-800. On the DZero experiment we helped with construction of the L1 muon trigger for Run II of DZero, the L1 Cal-Track trigger for run II, and the design of the global monitoring software. Collaborators also participated in the  $B_0 \rightarrow \mu^+ \mu^-$  search on DZero and in the measurement of the top quark mass. We helped in the production cross section and decay properties ( $W$  helicity) for Run II of DZero and co-led the muon upgrade for Run II of DZero. Group members also served as the algorithms and computing coordinator for DZero.

PARTICLE PHYSICS RESEARCH FOCUS: CP violation and SUSY, top quark physics.

WHAT SETS PARTICLE PHYSICS AT THE UNIVERSITY OF ARIZONA APART?

The ability to make big contributions to the design, operation and analysis of an experiment with relatively few people.

FUNDING AGENCY: Department of Energy

FAVORITE NATIONAL LABORATORY: Fermilab



View all [University profiles](#)

## Fiscal update

The fiscal year 2010 regular appropriations bills to fund the federal government, including the Energy and Water appropriation that includes Fermilab's funding, have not yet been passed by Congress or signed by the President. Congress passed a continuing resolution on Sept. 30. The resolution would fund government through Oct. 31, 2009, at which point the regular appropriations bills are expected to be passed and signed by the President. The laboratory's fiscal planning includes provisions for a continuing resolution at the beginning of each fiscal year, so the laboratory has sufficient funds in its contract to maintain normal operations during this period.

## Accelerator Update

Sept. 28-30

- Four stores provided ~ 29.5 hours of luminosity
- Trouble with TeV quadrupole power supplies
- NuMI switched to anti-neutrino mode
- Store 7226 aborted

[Read the Current Accelerator Update](#)

[Read the Early Bird Report](#)

[View the Tevatron Luminosity Charts](#)

## Announcements

## Latest Announcements

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

[Special film screening in Chicago for Year of Astronomy ends today](#)

[ACU presents "Investing in an Uncertain Market" today](#)

[Toastmasters today](#)

[Annual enrollment begins today](#)

[Submit advance leave agreement form](#)

[NALWO - Annual Autumn Potluck Luncheon - Oct. 2](#)

[Day of Astronomy in Aurora - Oct. 3](#)

[Prairie Seed Harvest - Oct. 3](#)

[English country dancing - Oct. 4](#)

## In the News

### Life in physics and the crucial sense of wonder

From **Cern Courier**, Sept. 30, 2009

As a grad student at Columbia around 1950, I had the rare opportunity of meeting Albert Einstein. We were instructed to sit on a bench that would intersect Einstein's path to lunch at his Princeton home. A fellow student and I sprang up when Einstein came by, accompanied by his assistant who asked if he would like to meet some students.

"Yah," the professor said and addressed my colleague, "Vot are you studying?"

"I'm doing a thesis on quantum theory."

"Ach!" said Einstein, "A vaste of time!" He turned to me: "And vot are you doing?"

I was more confident: "I'm studying experimentally the properties of pions."

"Pions, pions! Ach, vee don't understand de electron! Vy bother mit pions? Vell, good luck boys!"

So, in less than 30 seconds, the Great Physicist had demolished two of the brightest - and best-looking - young physics students. But we were on cloud nine. We had met the greatest scientist who ever lived!

[Read more](#)

[On-site prescription eyewear technician dates of absence](#)

[Yoga class begins Oct. 6](#)

[Muscle toning class begins Oct. 6](#)

[Excel shortcuts class - Oct. 13](#)

[Thai Village restaurant discount](#)

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

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

[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](#)

[Sign up for fall Science Adventures classes](#)

[Scottish country dancing Tuesday evenings at Kuhn Village Barn](#)

[Weight Watchers at Work coming soon](#)

[International folk dancing Thursday evenings at Kuhn Village Barn](#)

[Submit an announcement](#)