

## Calendar

[Have a safe day!](#)

**Friday, Oct. 30**

**3:30 p.m.**

DIRECTOR'S COFFEE  
BREAK - 2nd Flr X-Over  
THERE WILL BE NO JOINT  
EXPERIMENTAL-  
THEORETICAL PHYSICS  
SEMINAR THIS WEEK

**Monday, Nov. 2**

**1:30 p.m.**

[Research Techniques Seminar](#)

- Curia II

Speaker: Juha Kalliopuska,  
VTT Micro and  
Nanoelectronics, Finland  
Title: Edgeless Detectors for  
High Energy Physics  
Applications

**2:30 p.m.**

[Particle Astrophysics Seminar](#)

- One West

Speaker: Tyce DeYoung,  
Pennsylvania State University  
Title: Particle Physics and  
Astrophysics with IceCube

**3:30 p.m.**

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

**4 p.m.**

All Experimenters' Meeting  
Special Topics: ILC Cavity  
Gradients and Manufacturing;  
CMS/LHC Report - Curia II

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

## Campaigns

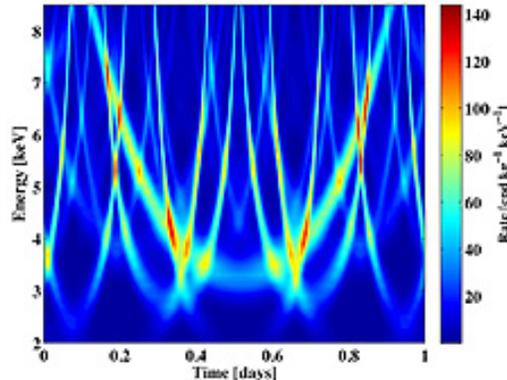
[Take Five](#)

[Tune IT Up](#)

[H1N1 Flu](#)

## Fermilab Special Result of the Week

### CDMS looks for finger prints of axions



The finger print that CDMS is looking for: the expected solar axion event rate in a germanium detector depends on the energy of the axions and the position of the sun in the sky. The position of the sun is plotted as time of day.

The theory of strong interactions, known as quantum chromodynamics, predicts that matter and antimatter behave slightly differently, a phenomenon known as CP violation. However, CP violation has never been observed in strong interactions.

In order to save QCD from this dilemma, theorists predict the existence of a particle known as the axion, which barely interacts with matter. While the particle fixes the CP violation problem, experiments have not yet detected any axions.

According to theory, an axion could emerge when a photon traverses a very strong electric or magnetic field. The core of the sun would be a perfect region for the creation of axions. The particles would immediately escape the sun and some of them would travel through Earth.

The Cryogenic Dark Matter Search, which takes place deep underground in the Soudan Underground Laboratory in Minnesota, has searched for axions and set new limits on the properties of these particles. The result made the cover of the [Oct. 1 issue](#) of Physical Review Letters.

The primary goal of the CDMS collaboration is the search for weakly interacting massive particles, which are candidates for dark matter particles. But its germanium and silicon

## Recovery Act Feature

### Roll out the wavelength shifter barrel



The first barrels of the chemical powders PPO and bis-MSB began arriving at Fermilab in September. During the next year, Fermilab will receive 8,700 kilograms of the powders.

The first batches of two powdered chemicals, dubbed wavelength shifters, for the future NOvA neutrino project arrived by the barrel at Fermilab recently.

The American Recovery and Reinvestment Act funded the \$2.1 million contract for the wavelength shifters, a crucial element for the neutrino project.

Scientists will use the two chemical powders, called PPO and bis-MSB, to change the wavelength of particles of light, called photons, into the required range for the experiment.

During the next year, Fermilab will receive 8,700 kilograms of the wavelength shifters. So far Fermilab has received 3,060 kilograms of the PPO and 120 kilograms of the bis-MSB powders.

"It takes a long time to manufacture this large amount of the powders," said John Cooper, Fermilab NOvA project manager. Fermilab will receive the wavelength shifters in multiple shipments as they become available, he said.

As each shipment arrives, scientists from Fermilab and Northern Illinois University will test the chemical powders for quality control. Using an ultraviolet and visible spectrophotometer, for example, scientists can study the powder's transmittance, which is the area of the light spectrum the material absorbs and transmits.

"These tests tell us about the purity of the powder," said Fermilab chemist Anna Pla-

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

## Weather

 Rain  
63°/41°

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

## Current Security Status

[Secou Level 3](#)

## Wilson Hall Cafe

### Friday, Oct. 30

- Chorizo burrito
- Italian vegetable soup
- Teriyaki chicken
- Southern fried chicken
- Mediterranean baked tilapia
- Eggplant parmesan panini
- Assorted slices of pizza
- Assorted sub sandwich

[Wilson Hall Cafe menu](#)

## Chez Leon

### Wednesday, Nov. 4 Lunch

- Pork braciolo
- Latin-fried rice
- Pineapple flan

### Thursday, Nov. 5 Dinner

- Red pepper soufflé with julienne of zucchini
- Lobster tail with drawn butter
- Spaghetti squash with scallions
- Steamed green beans with dill
- Crémé brûlé

[Chez Leon menu](#)

Call x3524 to make your reservation.

## Archives

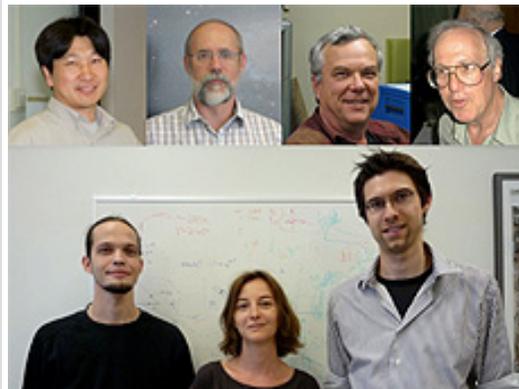
detectors, which operate at 40 milliKelvin, are also extremely sensitive to low-energy X-ray photons and hence serve as axion detectors as well. Solar axions that traverse the CDMS detectors would coherently scatter off crystals in the detectors, akin to X-ray Bragg scattering off crystal planes. The interaction probability depends on the energy and the incident angle of the axions.

Determining the incident angle required the precise knowledge of the orientation of the detector crystal planes, which are located a half mile underground, with respect to the location of the sun — a daunting task. Fortunately, in 1999 the Fermilab Alignment Group had measured the absolute geodesic true North in the Soudan mine to within a few millidegrees of accuracy. The directions of the CDMS crystal planes are also precisely known.

Still, CDMS scientists had to correlate the two measurements, a challenge since the detectors are located inside a vacuum vessel and buried within a massive shield to protect the detectors from background noise. Ultimately, CDMS scientists determined the direction of their detectors relative to the sun to within three degrees of accuracy.

A detailed analysis of the CDMS data has not yet revealed evidence for solar axions: the search continues. The [article](#) in the Oct. 1 issue of Physical Review Letters provides detailed information.

— *Jonghee Yoo*



These members of the CDMS collaboration played a leading role in this analysis: top row, from left: Jonghee Yoo and Dan Bauer, Fermilab; Jim Beaty, University of Minnesota; Steven Yellin, Stanford University. Bottom photo, from left: Tobias Bruch, Laura Baudis and Sebastian Arrenberg, University of Zurich.

**Special Announcement**

Dalmau. "We requested 99.5 percent purity for NOvA, and we want to make sure that what we get works." All of the shipments received thus far have met the specifications requested by NOvA, she said.

Fermilab awarded the contract to Curtiss Laboratories, a small company in Bucks County, Pa., after a rigorous bidding and technical evaluation process. The nine-person company has reliably supplied chemicals to Fermilab for more than 10 years.

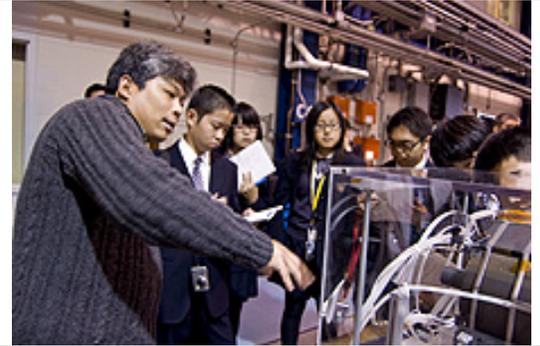
Fermilab expects the next shipment of the wavelength shifters to arrive in November.

— *Elizabeth Clements*

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

## Feature

## High school students from Japan visit Fermilab



CDF's Koji Sato explains the function of the CDF silicon detector to 10 high school students visiting from Shizuoka-Kita High School in Japan. The students visited Fermilab from Oct. 19 to 21.



During the hour-long tour of the CDF facility, Sato answered questions from the students about how the detector works. "Typically I don't get as many questions, so I think they were interested," Sato said.

## Announcements

**Info**

*Fermilab Today*

is online at:

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

Send comments and suggestions to:

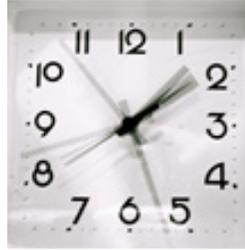
[today@fnal.gov](mailto:today@fnal.gov)

Visit the Fermilab

[home page](#)

## Daylight saving time: Change your clock and battery

The members of the Fermilab Fire Department would like to remind you that daylight saving time [ends](#) this Sunday at 2 a.m.



Set your clock back one hour Saturday night and replace fire alarm batteries. *Image courtesy of Ben Dobson through the Creative Commons license.*

When you set your clocks back an hour, remember to check and/or change the batteries in your flashlights and smoke and carbon monoxide detectors.

You should also remove dust from detectors monthly for proper operation. Statistics show that properly working smoke detectors save lives. Contact the Fire Department at x3428 with any questions.

You can learn more about the history of daylight saving time [here](#).

### In Brief

## TSA program requires additional passenger data

Effective immediately, the Fermilab Travel Office is requiring all Fermilab travelers, travel arrangers and users to complete a travel profile. The profile will include your name, birth date, home address, emergency contact details, business e-mail, business phone number and Fermilab employee identification number.

The Transportation Security Administration (TSA), an agency in the Department of Homeland Security, has put into place a Secure Flight program requiring airlines to collect additional passenger data for their flights. In an effort to comply with TSA and airline requirements and to minimize delays at security check points, the Fermilab Travel Office will transmit information collected from you to the airlines.

The Travel Office will store the information permanently in a database that the Computing Division has ensured is secure to hold personal information. You can log in to modify your profile online at any time.

Instructions for how to create your profile are located on Fermilab's [travel site](#).

## Latest Announcements

[English country dancing with live music - Nov. 1](#)

[Fermilab cafeteria closed tomorrow](#)

[GSA Halloween Party today](#)

[Fermi Martial Arts classes - Nov. 2](#)

[Health screenings available](#)

[Health Risk Assessments - Learn more about your potential health risks](#)

[Coed indoor volleyball starts in November](#)

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

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

[PowerPoint Tips and Tricks - Nov. 11](#)

[Access 2007: Intermediate - Nov. 18](#)

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

[HTML Intro: Intro to Web Publishing - Dec. 1](#)

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

[Discount movie tickets available](#)

[Chicago Bulls discount tickets](#)

[Chicago Blackhawks discount tickets](#)

[Thai Village restaurant discount](#)

[Additional Activities](#)

[Submit an announcement](#)

### Classifieds

Find new [classified ads](#) on *Fermilab Today*.

More information about Secure Flight is available [here](#).