

## Calendar

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

Wednesday, Nov. 10  
11:30 a.m.  
ES&H Winter Fair - WH Atrium  
1 p.m.

### [LHC Physics Center: Topic of the Week Seminar](#)

Sunrise - WH-11SE  
Speaker: Jesse Thaler,  
Massachusetts Institute of  
Technology

Title: Event Topologies for  
Early LHC  
2:30 p.m.

### [Theoretical Physics](#)

### [Seminar \(NOTE DATE\)](#)

Curia II  
Speaker: Nima Arkani-Hamed, Institute for Advanced Study

Title: Space-Time,  
Quantum Mechanics and Scattering Amplitudes  
3:30 p.m.

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

### [Fermilab Colloquium](#)

- 1 West  
Speaker: Bjarne Stroustrup, Texas A&M University  
Title: Introducing C++0x

Thursday, Nov. 11  
2:30 p.m.

### [Theoretical Physics Seminar](#)

- Curia II  
Speaker: Takemichi Okui, Florida State University  
Title: Viable Gravity Mediation  
3:30 p.m.

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

### [Accelerator Physics and Technology Seminar](#)

- One

## Feature

### Make something FABulous at Fermilab Friday, Nov. 12



MIT Center for Bits and Atoms Director Neil Gershenfeld will present a lecture on Friday.  
*Photo credit: MIT Spectrum*

The replicators from the Starship Enterprise might be closer to reality than you'd think. A relatively simple setup designed by MIT's Fab Lab group allows anyone to make components for computers, musical instruments or even houses quickly and easily – and it's coming to Fermilab.

This Friday from 1-8 p.m., Fermilab's Public Lecture Series will host Fab Lab demonstrations in the Wilson Hall atrium, presented by volunteers from the University of Illinois, Urbana-Champaign. At 8 p.m., Neil Gershenfeld, director of MIT's Center for Bits and Atoms, will give a lecture, "How to Make (Almost) Anything." Tickets to the lecture are \$7; the demonstrations are free of charge.

Dave Dykstra, chair of the Fermilab Lecture Series, thinks that MIT's travelling lab demonstrations and the lecture are perfect for Fermilab.

"Technology is related to science, and we have all this custom-made stuff for our experiments, so we could probably use having one of these labs," Dykstra said. "Plus, I just thought it was cool."

The equipment, which includes a laser cutter, a vinyl cutter and a computer numerical control (CNC) router that directs the machine tools, is designed to be user friendly and accessible to anyone with an

## From the CMS Center

### Fast forward through the history of particle physics

*Lothar Bauerdick, head of the CMS Center at Fermilab, wrote this week's column.*

Last Thursday, Nov. 4, CERN finished the first LHC physics run with proton-proton collisions at 7 TeV. The end of the proton run, however, doesn't give us a chance to rest. On Monday, we began to record the first lead-on-lead collisions while continuing to analyze our proton-proton data.



Lothar Bauerdick

During the last seven months, the CMS experiment has collected some 43 inverse picobarns of collision data. That number can hardly describe the excitement--and sometimes drama--of this first LHC run: After some initial uncertainties, the machine went on a soaring streak, with the luminosity, or number of collisions, often doubling every week. The CMS collaboration, which had waited for collision data for so long, suddenly found itself in a world where the accelerator was performing at an exponential pace.

The startup in March was slow and, as expected, produced very little data. It took several months to integrate the first 0.2 inverse picobarns of luminosity. That was the amount of the data that we collected in time for the big particle physics conference in July in Paris. We recorded most of that data just days before the start of the conference; we analyzed it in a frenzy so that we could present our first results at the conference.

During the summer, we wrote the first CMS physics papers, such as the measurement of top pair production and the search for dijet resonances. These

West  
Speaker: Hengjie Ma,  
Brookhaven National  
Laboratory  
Title: Low-Level RF  
Development Experience  
from SNS and NSLS-II

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

[Upcoming  
conferences](#)

## Campaigns

[Take Five](#)

[Tune IT Up](#)

## Weather



Mostly Sunny  
68°/44°

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

## Current Security Status

[Secon Level 3](#)

## Wilson Hall Cafe

Wednesday, Nov. 10

- Breakfast: English muffin sandwich
- \*Beef barley soup
- Gyros
- \*Caribbean grilled salmon
- Stuffed peppers
- Beef and cheddar panini
- Assorted sliced pizza
- Grilled chicken bowtie w/  
tomato cream

\*Carb restricted alternative

[Wilson Hall Cafe Menu](#)

## Chez Leon

Wednesday, Nov. 10

Lunch

- Stuffed cabbages
- Apple strudel

idea.

Gershenfeld's Fab Lab setup has garnered interest from leaders in third world countries and small villages throughout the world. In a previous [talk](#), he explained how areas that can't afford to build huge factories or hire manufacturers for specialized items unique to their communities could benefit from such a lab. More locally, industries such as automobile manufacturers and entrepreneurial groups have also become interested in Fab Labs, as have artists and laborers.

"As prices come down, people could have these in their homes," Dykstra said. "We have personal computers; we could have personal fab machines."

Betty Barrett, a UIUC professor who volunteers with Fab Lab and will be demonstrating on Friday, said that participants at her campus have been making everything from baby diapers to robotic arms.

"It's really an amazing experience for people when they come in and just let themselves think," said Barrett. "This is the seed for design and innovation around the world. It's not futuristic, it is the future."

[More information](#)

- Sara Reardon

## Special Announcement

### ES&H Fair today in atrium

The ES&H Section will hold a laboratory-wide fair today from 11:30 a.m. to 1 p.m. in Wilson Hall atrium. At the fair you can learn how to stay safe in winter weather, take the commuting and travel survey and get free goodies and treats.

## In the News

### Dark worlds: A journey to a universe of unseen matter

From [Scientific American](#), Nov. 4, 2010

On September 23, 1846, Johann Gottfried Galle, director of the Berlin Observatory, received a letter that would change the course of astronomical history. It came from a Frenchman, Urbain Le Verrier, who had been studying the motion of Uranus and concluded that its path could not be explained by the known gravitational forces

papers were based on a data sample of about 3 inverse picobarns. Last month, we gathered that amount of data in a single weekend.

Every factor of 10 in LHC luminosity has yielded new results: first particle tracks; first particle resonances such as the J/psi; first candidate events for the electroweak bosons, W and Z; first top quarks; first measurements of cross sections; first constraints on deviations from the Standard Model. It was like going through the whole history of particle physics in the span of a few months.

I'm astounded by the speed with which we are able to extract physics results from the collision data. Two facts contribute: our in-depth preparation for the analyses even before we had data and the outstanding quality of the data. Most of us were surprised by how accurately our Monte Carlo simulations describe the collision data that the LHC produces.

More results are to come. We still have to finish analyzing 10 times more data than we already did; we expect to publish those results during the coming months.

Next year, we expect to gather about 1,000 inverse picobarns, or 25 times more collisions than this year. That might be enough to open a first window to new particle physics phenomena that nobody has seen before.

## Safety Update

### ES&H weekly report, Nov. 9

This week's safety report, compiled by the Fermilab ES&H section, includes one recordable incident. Find the full report [here](#).

[Safety report archive](#)

## Announcements

### Latest Announcements

[Fermilab winter volleyball league](#)

[Toastmasters - Nov. 18](#)

[ES&H winter fair today](#)

[Indian Creek Road closed until 3:30 pm Thursday](#)

Thursday, Nov. 11

Dinner

-Closed

#### [Chez Leon Menu](#)

Call x3524 to make your reservation.

#### Archives

##### [Fermilab Today](#)

[Director's Corner](#)

[Result of the Week](#)

[Safety Tip of the Week](#)

[CMS Result of the Month](#)

[User University](#)

[Profiles](#)

[ILC NewsLine](#)

#### Info

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acting on it. Le Verrier suggested the existence of a hitherto unobserved object whose gravitational pull was perturbing Uranus's orbit in precisely the way required to account for the anomalous observations. Following Le Verrier's directions, Galle went to his telescope that night and discovered the planet Neptune.

A similar drama—in which astronomers observe anomalous cosmic motions, deduce the presence of new matter and go out to hunt for it—is playing out again today in modern cosmology. In the role of Uranus, we see stars and galaxies moving in ways they should not; in the role of Neptune, we deduce the existence of hitherto unobserved substances, provisionally called dark matter and dark energy. From the types of anomalies we see, we can glean a few basic facts about them. Dark matter seems to be a sea of invisible particles that fills space unevenly; dark energy is spread out uniformly and acts as if it is woven into the fabric of space itself. Scientists have yet to repeat Galle's accomplishment of pointing an instrument at the sky and glimpsing the unseen players definitively, but tantalizing inklings, such as blips in particle detectors, continue to accumulate.

[Read More](#) (subscription required)

[Help ES&H: take commuting and travel survey](#)

[Annual Enrollment: deadline Nov. 22](#)

[Lunch and Learn about Qigong, Mindfulness & Tai Chi Easy for Stress Reduction - Nov. 10](#)

[Free CERN LHC book](#)

[Free noontime concert: solo piano by Jacqueline Schwab - Nov. 11, Ramsey Auditorium](#)

[Special English Country Dance with Jacqueline Schwab - Nov. 10 in St. Charles](#)

[Bullying: It's everyone's problem - Nov. 18](#)

[Nov. 22 deadline for The University of Chicago Tuition Remission program](#)

[Pedestrian safety awareness for families](#)

[Pedestrian safety at crosswalks](#)

[Accelerate to a Healthy Lifestyle program through Dec. 31](#)

[Chicago Blackhawks November discount tickets](#)

[Submit an announcement](#)