

## Calendar

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

Friday, Sept. 11

3:30 p.m.

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

Monday, Sept. 14

2:30 p.m.

### [Particle Astrophysics Seminar](#)

- One West

Speaker: Josh Frieman,  
Fermilab/University of Chicago

Title: Constraining Dark

Energy: First Results from the  
SDSS-II Supernova Survey

3:30 p.m.

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

4 p.m.

All Experimenters' Meeting -  
Curia II

Special Topic: CMS/LHC  
Report

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

## Campaigns

### [Take Five](#)

### [Tune IT Up](#)

## Weather



Sunny  
80°/55°

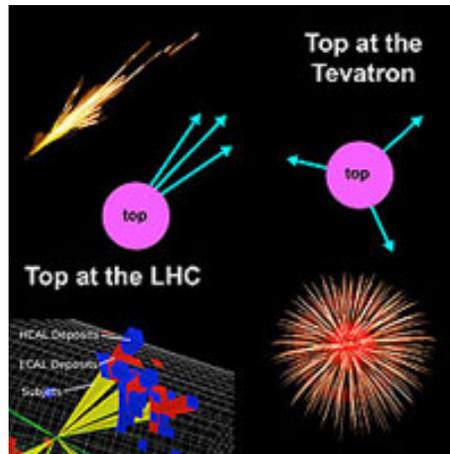
### [Extended Forecast](#)

### [Weather at Fermilab](#)

## Current Security Status

## CMS Result of the Month

### Top like you never saw it before



In the LHC, top quarks will be produced moving very fast. As a consequence, scientists expect the signature for top quark production to be very different than that observed at the Tevatron. These photographs of fireworks serve as a visual metaphor of the qualitative differences between what will be observed at the two accelerator complexes.

Top quarks were discovered in 1995 at the Tevatron, which is still the only operating particle accelerator capable of creating them. The Tevatron's energy is just high enough to make these very heavy particles. Using his famous equation,  $E = mc^2$ , Einstein taught us that energy and mass are actually the same thing. Therefore because the top quark's mass is so high, essentially all the Tevatron's energy goes into making it. Very little energy is left over to make the top quark move. Because of this, top quarks are made nearly at rest in the Tevatron.

However, the LHC's design energy is seven times larger than the Tevatron's, which means that making top quarks in the LHC will be easy by comparison. The LHC's extra energy will also be able to make the top quarks move, blasting them out of the collision at a very high energy. Thus, the techniques available to CMS researchers interested in top quarks are quite different than those employed by CDF and DZero.

The majority of the time, top quarks decay into three quarks of lower mass. While waiting for LHC collisions, CMS researchers studied in simulated data how they will search for top quarks in data produced in their detector once

## Recovery Act Feature

### It starts with a hole

**Editor's note:** Recent photos from Ash River, Minn., illustrate progress at the future site of the NOvA detector facility, a construction project funded in part by the American Recovery and Reinvestment Act.



The 20-foot-deep hole outlines where the future detector facility will reside. Next, construction crews will deepen the hole to 40 feet.



Construction crews drill to help excavate the site.



Pulverized rock from the excavation will form the base for roads on the site, serve as backfill to support the structure of the detector facility and become part of the roof of the detector building to

[Secon Level 3](#)[Wilson Hall Cafe](#)

Friday, Sept. 11

- New England clam chowder
- Black & blue cheeseburger
- Tuna casserole
- Dijon meatballs over noodles
- Bistro chicken & provolone panini
- Assorted sliced pizza
- \*Carved top round of beef

[Wilson Hall Cafe menu](#)[Chez Leon](#)

Wednesday, Sept. 16

Lunch

- Northern Italian lasagna
- Mixed green salad
- Almond orange cake

Thursday, Sept. 17

Dinner

- Beet and Roquefort salad w/ walnuts
- Chilean sea bass w/spicy red pepper sauce
- Lemongrass rice
- Sautéed spinach with garlic & lemon
- Fresh fruit tart

[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](#)

the beam turns on. Using an innovative algorithm, the researchers looked for localized energy in their calorimeter with a specific three-lumps structure (one for each quark). Based on their results, researchers are optimistic. For energies above about 15 percent of the expected total collision energy, CMS scientists expect to be able to identify about half of the top quarks created when LHC collisions begin.

The production of top quarks is a very attractive thing to study. These particles are by far the heaviest subatomic particle and it is thought that this very heavy mass may well serve as a path to finding new physical phenomena. Thus any technique that helps identify top quarks is potentially a crucial contribution to the next big discovery.

For more information, one should look at these [slightly advanced](#), [technical](#), and original [theoretical](#) descriptions.

-- Don Lincoln



**Petar  
Maksimovic**

**Salvatore  
Rappoccio**

These physicists from Johns Hopkins University are the principal authors of this technical study on finding top quarks at the LHC in CMS. They are just a few of the large [group of people](#) studying the problem. This group is led by Francisco Yumiceva and Roberto Chierici.



**Oliver Gutsche  
Fermilab**

**Kristian Hahn  
MIT**

**Dave Mason  
Fermilab**

Fermilab is a Tier 1 site for CMS data. Each Tier 1 center will keep a copy of CMS data sets and the centers form a national computational hub. These physicists are responsible for running data operations at Fermilab's Tier 1 center.

[Tune IT Up](#)

[shield the experiment from cosmic and gamma rays.](#)



[What used to be mud is now a road to the NOvA site, covered with gravel from the excavation for the detector facility.](#)

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

[Special Announcement](#)

## URA Visiting Scholars applications due Sept. 18

Applications for the second round of 2009 awards in the Universities Research Association, Inc. (URA) Visiting Scholars Program at Fermilab are due Sept. 18. Successful applicants will be notified at the end of October. These awards provide financial support for faculty and students from URA's 87 member universities to work at Fermilab for periods of up to one year.

[Learn more](#)

[Announcements](#)[Latest Announcements](#)

[Barn dance - Sept. 13](#)

[URA Visiting Scholars Program now accepting applications](#)

[Argentine Tango through Sept. 30](#)

[Fermilab Toastmasters can help you find your voice - Sept. 17](#)

[Chicago Field Office of Intelligence and Counterintelligence to offer counterintelligence cyber awareness seminar - Sept. 15](#)

[Bowlers wanted Wednesday nights](#)

*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](#)

## IMAP password reminder

If you have not already done so, please change your password for your IMAP e-mail account by the new extended deadline of the end of the day on Tuesday, Sept. 22.

If you have not reset your password since Aug. 18, you must reset it – even if your password is already at least 10 characters long. If you do not reset your password, you will not be able to log on to your e-mail account and will need to contact the Service Desk to re-enable your account.

The password must be at least 10 characters in length to fulfill DOE password complexity requirements.

A strong password will include a combination of letters, symbols and numbers. For instructions on how to change your IMAP password, see this [site](#).

Service Desk representatives will offer assistance at the Password Doctor booth in the Wilson Hall atrium during lunch hours on Monday and Tuesday. They are also available during business hours at the Service Desk and at x2345. Please bring your Fermilab identification to the booth or Service Desk.

### In the News

## Black holes are the ultimate particle smashers

From *New Scientist*, Sept. 9, 2009

What will happen to fundamental physics when our descendants reach the limit of particle accelerator technology? We'll surely run out of space and money long before the smallest building blocks of the universe can be probed with machines, because of the massive energies required.

One saviour may be the universe's own particle smashers - black holes. If two particles are accelerating towards a rotating black hole with a certain velocity then they should collide with energies higher than anything we could hope to achieve on Earth.

[Read more](#)

[Thai Village restaurant discount](#)

[Robotics for Fermilab employees' children](#)

[Scrapbooking Open House - Sept. 14](#)

[New Lo Cardio class - Sept. 14 - Nov. 16](#)

[New Tai Chi For Health class - Sept. 14 - Nov. 16](#)

[Six Flags Great America discount tickets](#)

[S&T Policy: A View from Washington, D.C. - Sept. 18](#)

[Mosaico Hispanico - celebrating Hispanic music and dance - Sept. 19](#)

[English Country Dancing - Sept. 20](#)

[MathWorks and Avnet demonstration - Sept. 23](#)

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

[Office 2007 New Features class offered in September](#)

[Buttered Rum performs on 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](#)

[Additional Activities](#)

[Submit an announcement](#)

Classifieds

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