

## Calendar

[Have a safe day!](#)

Thursday, Nov. 19  
9 a.m. - 5 p.m.

[Higgs Physics at the Tevatron and LHC workshop: the QCD Issues](#) - One West

2:30 p.m.

[Theoretical Physics Seminar](#) - Curia II

Speaker: Rouven Essig, SLAC National Accelerator Laboratory

Title: Probing Dark Forces with Low-Energy e+e- Colliders, New Fixed-Target Experiments, and Dwarf Galaxies

3:30 p.m.

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

4 p.m.

[Accelerator Physics and Technology Seminar](#) - One West

Speaker: Bill Ng, Fermilab

Title: Coupling Impedances of Accelerator Rings (Part 4 of 4)

Friday, Nov. 20

3:30 p.m.

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

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

## Campaigns

[Take Five](#)

[Tune IT Up](#)

H1N1 Flu

## Feature

## Technical Division designer Gerry Davis retires this week



Gerry Davis, a designer for the Technical Division, will retire this week after 30 years at Fermilab. Displayed behind him is a computer-aided design for a component in the High Intensity Neutrino Source.

After 30 years and three months of translating engineering specifications and technical requirements into detailed drawings and 3-D models, Technical Division designer Gerry Davis will retire this week.

Davis started work at Fermilab on Aug. 6, 1979, as a designer for Technical Support, which would later become Technical Division.

He first worked out of the basement of an old farmhouse, a location that used to be across the road from CDF, where he designed machine components by hand with drafting pencils, paper and a straightedge. He eventually moved to a trailer outside the Industrial Center Building. His design work gradually shifted toward computer-aided design.

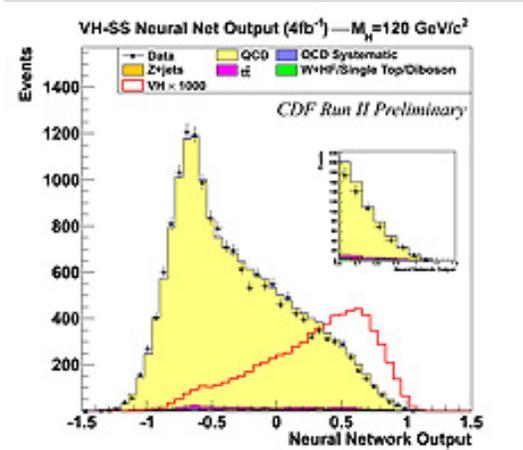
With input from engineers and project managers, Davis manipulates a keyboard and mouse to create detailed 3-D models of every part of a machine, making decisions about how to arrange wires, pipes and other components. One of the thrills of the job, Davis said, is when after months of design work he sees the final product.

While he's enjoyed working on many projects, Davis said one of his career highlights at Fermilab was designing components for the Superconducting Super Collider.

In retirement Davis plans to move to Arizona,

## Fermilab Result of the Week

## Hunting for Higgs in jets: No channel left behind



The plot shows the output of the neural network trained to search for the Higgs boson. The background, dominated by QCD, lies at low neural net values, while the Higgs boson signal sits at large neural net values. This means that advanced techniques may be able to extract the tiny signal even with a large background. The inset shows the background and data in the high-signal region. As the data follows the background prediction, we conclude there is no Higgs signal in the data. If a Higgs signal were present, there would be an excess in the data in this high signal region.

The Higgs boson is the last undiscovered particle of the Standard Model. Scientists believe that the Higgs plays a central role, allowing particles to acquire mass. With the imminent LHC turn on, the search for the Higgs is one of the most exciting efforts at the Tevatron.

The CDF collaboration has recently completed a search for events where the Higgs is produced either with a W or Z boson that decays into two quarks, or via the fusion of two W or Z bosons. In both processes, the Higgs is produced with two extra quarks that produce sprays of particles in the detector called jets.

For a low-mass Higgs ( $< 135 \text{ GeV}/c^2$ ), which is considered in this analysis, the Higgs decays primarily to two bottom quarks. Thus, the signature of this search is four or more jets, with at least two jets coming from bottom quarks.

At the Tevatron, most of the low-mass Higgs searches concentrate on signatures that contain leptons (electrons, muons and taus),

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

## Weather

 Rain likely  
46°/35°

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

## Current Security Status

[Secon Level 3](#)

## Wilson Hall Cafe

Thursday, Nov. 19  
- Apple sticks  
- Minnesota wild rice with chicken  
- Tuna melt on nine grain  
- Italian meatloaf  
- Chicken casserole  
- Buffalo krispy chicken wrap  
- Assorted slices of pizza  
- Mandarin chicken

[Wilson Hall Cafe Menu](#)

## Chez Leon

Thursday, Nov. 19  
Dinner  
- Egg drop soup  
- Asian braised beef short ribs  
- Roasted new potatoes  
- Sautéed spinach  
- Lemon Napoleon

Wednesday, Nov. 25

Lunch  
- Cheese fondue  
- Marinated vegetable salad  
- Peaches with raspberry sauce

[Chez Leon Menu](#)

Call x3524 to make your reservation.

## Archives

where he is looking forward to the warmer weather and golfing. He also plans to travel.

"I'm going to miss all of Fermilab, actually. I'll really miss the people, but I also love the work," Davis said. "I'm not going to miss the weather."

Co-worker Don Arnold, another designer in the Technical Division, said Davis has always been a valuable resource for design questions. Colleagues will miss Davis both at work and on the golf course, where Davis often played as a substitute, Arnold said.

Colleagues will gather today for coffee and cake to say farewell to Davis from 1:30 to 3:30 p.m. in Trailer 157 behind the Industrial Center Building.

— *Chris Knight*

## Photo of the Day

### Fulbright grantees make visit to Fermilab for site tour



About 80 Ph.D. candidates from 57 countries who are International Fulbright Science and Technology grantees visited Fermilab on Nov. 13 for an afternoon tour. The grantees were in Chicago for a joint meeting with the American Association for the Advancement of Science.

## In the News

### New site tracks how stimulus dollars flow to science

From *Wired*, Nov. 17, 2009

More than \$20 billion in stimulus money has poured into the nation's universities, according to a new collection of data gathered by a trio of research consortia.

California's institutions were the big winners, snagging 1,602 grants worth almost \$1.2 billion, but the money was spread across the country. Alaska received the most per capita at \$248, more than three times the next state, Tennessee, on that metric.

photons or large amounts of missing energy. These signatures are hard to mimic from background processes but the number of potential Higgs candidates is small. The advantage of the all-jets signature is that it has the largest signal yield. However, quantum chromodynamics multi-jet events can easily fake this signature, creating a background produced with a rate a billion times larger than the Higgs.

Despite these odds, the CDF physicists took the challenge. They employed a data-driven method to model the QCD background, thus avoiding the long computation time that would have been required to simulate it. To determine the Higgs signal from the gigantic background, scientists developed several new innovative techniques for this analysis.

One such technique exploited the difference in the shapes of gluon and quark jets. The gluon jets, found in the QCD background, tend to be broader than the quark jets, found mostly in the Higgs signal.

With the new improvements and a doubled analysis data sample, the sensitivity of this analysis to the Higgs boson improved by a factor of two. This made the search quite competitive with the other Higgs searches at the Tevatron. In the race for the Higgs boson, the Tevatron can't afford to have any channels left behind.

— *Edited by Craig Group*



The scientists responsible for this result are from left: Ankush Mitra, Shang-Yuu Tsai and Song-Ming Wang, all with Academia Sinica, Taiwan.

## Accelerator Update

Nov. 16-18

- Two stores provided approximately 25 hours of luminosity
- TeV sector A2 power lead problems
- P1 transfer line power supply failure
- NuMI record for protons on target set

[Read the Current Accelerator Update](#)

[Read the Early Bird Report](#)

[View the Tevatron Luminosity Charts](#)

## Announcements

[Fermilab Today](#)[Result of the Week](#)[Safety Tip of the Week](#)[CMS Result of the Month](#)[User University Profiles](#)[ILC NewsLine](#)**Info**[Fermilab Today](#)

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Send comments and

suggestions to:

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

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"This is the largest investment in science and research probably since Sputnik," said Bill Andresen, a vice president at the University of Pennsylvania in charge of Federal affairs and president of The Science Coalition. "We think it's really important to tell this story in a thoughtful, useful way so that the public and policymakers can understand how it's being spent."

[Read more](#)**In the News****Stars' birth influenced by magnetic fields**From **USA TODAY**, Nov. 16, 2009

Powerful magnetic fields guide the birth of giant stars, report radio astronomers Monday.

Looking at the glowing gas of the Orion Nebula, a prodigious stellar nursery, the team led by Lincoln Greenhill of the Harvard-Smithsonian Center for Astrophysics reports on the build-up of a giant "protostar" called Source I over the last two years. "We know how these stars die, but not how they are born," Greenhill says, in a statement.

The federal National Science Foundation's Very Long Baseline Array (VLBA) radio telescope allowed the team to discover gas clouds called masers -- "laser-like beacons often associated with star formation" -- orbiting the protostar. Some are as close as Jupiter to the sun in our solar system.

[Read more](#)**Latest Announcements**[NALWO winter tea - Dec. 1](#)[University of Chicago tuition remission deadline - Nov. 24](#)[Free introductory martial arts classes - Dec. 14 and 16](#)[Prescription eyewear technician location change - begins Nov. 25](#)[Process Piping \(ASME B31.3\) class meets today](#)[International folk dancing Thursday evenings at Kuhn Village barn](#)[Register for your TurkeyDate](#)[2010 entertainment discount book available online](#)[Lederman Science Center holiday hours](#)[Consider a car or van pool this winter](#)[Argentine Tango at Fermilab meets Wednesday nights](#)["The Night Before Christmas Carol" at Fermilab Arts Series - Dec. 5](#)[Wilson Hall stocking stuffer holiday sale - Dec. 9-10](#)[Fermilab Management Practices seminar - Feb. 11](#)[Discount movie tickets available](#)[Chicago Blackhawks discount tickets](#)[Thai Village restaurant discount](#)[Additional Activities](#)[Submit an announcement](#)