

Calendar

[Have a safe day!](#)

Thursday, Dec. 17
2:30 p.m.

[Theoretical Physics Seminar -](#)

Curia II

Speaker: Richard Hill,
University of Chicago
Title: SU(3)/SU(2): The
Simplest WZW Term
3:30 p.m.

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

THERE WILL BE NO
ACCELERATOR PHYSICS
AND TECHNOLOGY
SEMINAR TODAY

4 p.m.

[Special Joint Experimental-
Theoretical Physics Seminar](#)

(NOTE DATE) - One West

Speaker: Lauren Hsu, Fermilab
Title: New Results from the
Cryogenic Dark Matter Search

Friday, Dec. 18

3:30 p.m.

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

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

[Upcoming conferences](#)

Campaigns

[Take Five](#)

[Tune IT Up](#)

H1N1 Flu

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

Special Announcement

CDMS to discuss newest results at 4 p.m. in One West



Dan Bauer, CDMS project manager and Fermilab scientist, removes one tower of detectors used in the Cryogenic Dark Matter Search experiment.

The CDMS collaboration will put rumors to rest this afternoon in a presentation on their newest results. Lauren Hsu, a researcher with the Cryogenic Dark Matter Search, will discuss the experiment's results and what they mean in a lecture at 4 p.m. in One West today. Overflow seating will be available in Curia II. The talk will be streamed live. You can access the live stream [here](#).

Feature

Symposium honors Chris Quigg for research, outreach



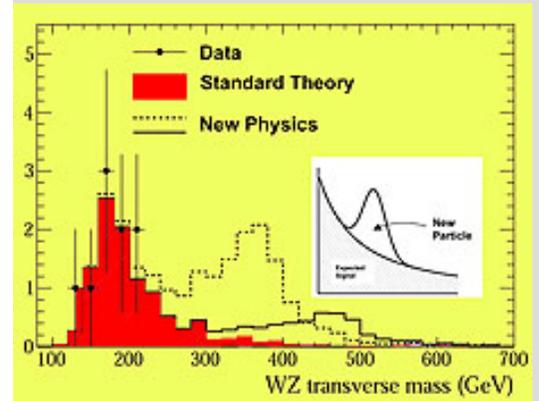
Chris Quigg listens to physics talks at a symposium in his honor with his wife, Liz, and their son, David, earlier this week. A symposium was held at Fermilab on Dec. 14 and 15 to celebrate Chris Quigg's 65th birthday.

Chris Quigg has left his imprint on the path of particle physics research, its practitioners and how the public views the field. Dozens of those who have benefited from his quick mind and warm spirit came this week to Fermilab, where Quigg has spent the last 35 ½ years, to highlight the programs he helped inspire.

"We have to be especially thankful for Chris, not only for his contributions but for getting old enough that we could have this party," said Fermilab Director Pier Oddone of the two-day

Fermilab Result of the Week

How to find a particle



DZero physicists searched for a new particle that would decay into a W and a Z boson. The data is given by the black dots, while the red region is the standard theory. The dashed and solid lines are two predictions from a new theory. No evidence for new physics is observed. The inset simple figure shows what the signature of a new particle might look like.

Hunting for new kinds of particles is part and parcel of the life of a particle physicist. But how do you do it? It's not like rummaging through your junk drawer looking for marbles. The particles we look for tend to decay very quickly, often so quickly that they don't have the opportunity to pass through the detector at all. However, the particles into which they decay often do live long enough for scientists to observe them as they interact with the detector. By measuring the energy and trajectory of the daughter particles, physicists can infer the mass of the parent (and unstable) particle.

So the question becomes "How do physicists know what to look for?" After all, there are lots of kinds of particle decays and there are endless combinations. Do they look for events with an electron and a muon? Or two muons? Or a muon, a pion, and so on and so on?

Well, there are two ways to search. In the first, a theoretical physicist might have a new idea and predict a new particle, which experimentalists would then look for. The Higgs boson is an example of such a search. The problem with that kind of search is physicists are looking for something specific and could miss an interaction/event that doesn't meet their search criteria.

Or, scientists can just look for combinations,

- [Weather](#)
- [Extended Forecast](#)
- [Weather at Fermilab](#)
- [Current Security Status](#)
- [Secon Level 3](#)
- [Wilson Hall Cafe](#)
- [Wilson Hall Cafe Menu](#)
- [Chez Leon](#)
- [Chez Leon Menu](#)
- [Archives](#)

symposium in honor of Quigg's 65th birthday. "When we needed soldiers he was ready to jump in the trenches. And more than just being a soldier, he also is an educator and ambassador for the field."

Talks covered public outreach, collider physics, science education, magnet technology, theory and research into neutrinos and dark matter, showing the breadth of Quigg's contributions. Several of the speakers reported first milestones, including the [largest collection of record-breaking energy level data](#) from the Large Hadron Collider, and project advances, showing the vibrancy of the field.

"In 1984 Quigg was one of four who defined much of the Tevatron program," said Paul Grannis, of Stony Brook University and a former DZero spokesman. That program is still churning out discoveries today and has essentially built the springboard for launching the LHC program, he added.

"Thanks for the constant and consistent guidance you have been giving us over several decades," Grannis told Quigg. "I hope we can get off the cusp (of discovering new physics) soon and gain the profound new understanding you have pointed us to."

Quigg strives for inclusivity inside and outside the field, traveling to developing nations to promote particle physics, encouraging women and young people in the field and stressing that peers should mention competitors' work as well as their own in talks.

Liz Simmons, of Michigan State University, recounted how during Snomass 2001 Quigg not only helped organize an event that brought a planetarium to the Snomass mall but also gathered up Spanish-speaking physicists to visit the ethnic neighborhoods around the laboratory that can get overlooked in outreach.

"This celebration doesn't mean you have done enough," Fermilab Deputy Director Young-Kee Kim joked. "We have much more for you to do."

-- Tona Kunz

Special Announcement

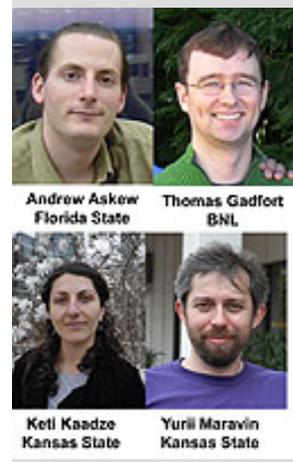
looking for something new. However, even if they see something unexpected, it's not always easy for them to know what they've found.

So, in the end, physicists do a hybrid search. They use their scientific judgment to pick a combination that is likely to be promising. Then they compare the measurement to the Standard Model prediction and look around for a theoretical prediction that has the same decay signature. (There are always some.... theorists are nothing if not prolific.) They then evaluate several theories, using a single measurement.

For instance, the DZero experiment has recently submitted for publication [a measurement](#) in which the daughter particles were a W and a Z boson. The data agreed beautifully with the Standard Model, but DZero physicists also compared the data to several possible theories and set limits on the theories. The fact that the data agreed so well with standard theory sets stringent limits on future theoretical ideas.

Comparing data to the known, with an eye out for the new, is how this sort of exciting work is done.

--Don Lincoln



These physicists were behind this interesting analysis. Keti Kaadze is one of several LHC émigré graduate students to make an important impact in the analysis of DZero data.

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

is online at:

www.fnal.gov/today/

Send comments and

suggestions to:

today@fnal.gov

Visit the Fermilab

[home page](#)

Employee Advisory Group nominations due Monday

[Nominations](#) for an employee advisory group forming at Fermilab are due on Monday, Dec. 21. The Fermilab Directorate is forming the group in response to the issues raised in the employee focus group process last winter. The advisory group will provide Fermilab senior management with employee perspectives, concerns, insights and suggestions with regard to the development and implementation of new and revised policies that affect the Fermilab workplace. It is Fermilab's goal to establish and maintain a safe and productive workplace environment where employees can pursue the highest-quality work while maintaining a healthy work/life balance. Consider [nominating](#) yourself or a coworker for this important role.

[Learn more](#) about the Employee Advisory Group.

Special Announcement

Tune IT Up physical inventory and assessment complete

Contractors from the Kemtah Group working with Fermilab's Tune IT Up team have completed their physical [inventory of desktops and laptops](#) at the laboratory. Thank you to everyone for your cooperation and for demonstrating your concern for cybersecurity at the laboratory.

The Tune IT Up team has also closed the Tune IT Up assessment and has begun to analyze the data collected. Special thanks go to the Fermilab Center for Particle Astrophysics, the first division, section or center to reach 100 percent completion of the assessment.

The Kemtah contractors will continue to follow up with employees and users who rescheduled their physical inventory visits this month. If you have not scheduled a visit, you should not expect anyone with the Tune IT Up campaign to visit your computer. Please continue to verify the identity of anyone requesting access to your machine.

In the News

Amitabha Das
Univ. ArizonaKen Johns
Univ. ArizonaNorik Khalatyan
FermilabPenny Kasper
FermilabJoel Steinberg
Univ. Arizona

The nature of particle physics is that the most interesting physics is very rare. In order to not overwhelm the electronics, we impose filters, called triggers, which pass only a small subset of the data for recording. These physicists and engineers are responsible for the operation of two of the trigger systems, one that identifies events that are likely to contain muons, and a second that matches information from the central tracking detector and the calorimeter to enhance the number of electrons in the data sample.

Accelerator Update

Dec. 14-16

- Four stores provided ~42 hours of luminosity
- Recycler kicker repaired
- Booster east anode power supply trips due to BRF1, 2, & 8

[Read the Current Accelerator Update](#)[Read the Early Bird Report](#)[View the Tevatron Luminosity Charts](#)

Announcements

[Fermilab December Payroll Information](#)[TIAA-CREF Financial Education Seminar - Dec. 21](#)[Process Piping Materials, Fabrication, Examination & Testing \(ASME B31.3\) class offered in Feb. 3-4](#)[Python Programming class offered Feb. 24-16](#)[East gate to begin closing 1-5 a.m. beginning Jan 5](#)[Scottish country dancing will meet every Tuesday through December](#)

UK physics hit by savage cuts

From *Physics World*, Dec. 16, 2009

The Large Hadron Collider achieved its goal to be most powerful physics machine in the world on Tuesday evening.

Savage cuts have been made to the UK's physics research programme that will see the country withdraw from over 25 leading international projects in astronomy, nuclear physics, particle physics and space science. The cuts were announced today by the Science and Technology Facilities Council (STFC), which is facing a £40m shortfall in funding. The cash crisis will see the UK pull out of the ALICE experiment at CERN, axe funding for the Boulby Mine in Yorkshire, which is searching for dark matter, and withdraw from the European X-ray Free Electron Laser project at the DESY lab in Hamburg.

The STFC released details of the cuts, which will kick in over the next five years, in a document entitled Investing in the Future 2010-15. The projects facing the axe in astronomy are Auger, Inverse Square Law, ROSA, Liverpool Telescope, the UK Infra-Red Telescope. The STFC will also close the Atacama Large Millimeter/submillimeter Array regional centre and cancel funding for the Joint Institute for Very Long Baseline Interferometry in Europe. These cuts are expected to save the STFC £29m.

[Read more](#)

[International folk dancing meets today, then not until Jan. 7](#)

[Give the gift of movies](#)

[Book atrium events through the Office of Communication](#)

[FMLA and FTL policy updates](#)

[English Country Dancing - Jan. 3](#)

[Fermilab Management Practices seminar beginning Feb. 11](#)

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

[Argentine Tango at Fermilab meets Wednesday nights](#)

[Prescription eyewear technician location change](#)

[Lederman Science Center holiday hours](#)

[Chicago Blackhawks discount tickets](#)

[Additional Activities](#)

[Submit an announcement](#)