

Calendar

Tue., April 3

3:30 p.m.

DIRECTOR'S COFFEE
BREAK - 2nd Floor X-over

4:00 p.m.

Accelerator Physics and
Technology Seminar - 1 West
Speaker: M. Kireeff Covo,
University of California,
Berkeley

Title: Electron Cloud
Measurements in the High-
Current Experiment

Wed., April 4

THERE WILL BE NO
FERMILAB ILC R&D
MEETING THIS WEEK

3:30 p.m.

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

4:00 p.m.

Fermilab Colloquium - 1 West
Speaker: K. Kumar, University
of Massachusetts, Amherst
Title: Electrons and Mirror
Symmetry

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

Weather



Thunderstorms 65°/31°

[Extended Forecast](#)

[Weather at Fermilab](#)

Current Security Status

[Secon Level 3](#)

Wilson Hall Cafe

Feature

Fermilab Update on Inner Triplet Magnets at LHC



CERN and Fermilab are developing repairs for inner triplet magnets, like this Q1 quadrupole, that failed a recent pressure test.

On Tuesday, March 27, a Fermilab-built quadrupole magnet, one of an "inner triplet" of three focusing magnets, failed a high-pressure test at Point 5 in the tunnel of the LHC accelerator at CERN. Since Tuesday, teams at CERN and Fermilab have worked closely together to address the problem and have identified the cause of the failure. Now they are at work on a solution.

The asymmetric force generated by the pressure of the test broke the supports in magnet Q1 that hold the magnet's cold mass inside the cryostat, which also resulted in damage to the electrical connections. The status of the Q1 cold mass itself is still being determined, as is the status of the other two magnets in the triplet, Q2 and Q3. Also under investigation is the status of a distribution feed box, or DFBX, designed to provide cryogenic fluids and electrical power for the inner triplet magnets.

The magnet supports are made of a material called G-11, a glass cloth-epoxy laminate. The specifications for the magnet designate 20 atmospheres as the design pressure criterion and 25 atmospheres as the acceptance test criterion. However, computer-aided engineering calculations completed independently by Fermilab and CERN on March 28 show that the G-11 support structure in the magnets was inadequate to withstand the associated longitudinal forces. CERN and Fermilab now know that this is an intrinsic design flaw that must be addressed in all triplet magnets assembled at Fermilab.

[Read more](#)

Director's Corner

The World Stage

Last Tuesday we took a pratfall on the world stage: the high pressure test of the Fermilab-built inner triplet failed dramatically in the LHC tunnel with a loud "bang" and a cloud of dust. It was the first time that the three magnets together with the associated interface box (DFBX) that supplies them with the cryogenic and electrical connections had been tested as an assembly. The high pressure test simulated conditions that can occur in a quench of an LHC sector. Teams at CERN and Fermilab have quickly determined the reason for the failure and are in the process of designing a solution to the problem. (See the article in this issue of *Fermilab Today*.)



Pier Oddone

What the analysis shows so far is that something extraordinarily simple was missed in the design: the obvious imbalance of axial forces that can occur under the conditions represented by the test or by a quench in the LHC. We do many very complex engineering projects successfully that require sophisticated engineering skills and advanced computing tools. We test the complex features we design thoroughly. In this case we are dumbfounded that we missed some very simple balance of forces. Not only was it missed in the engineering design but also in the four engineering reviews carried out between 1998 and 2002 before launching the construction of the magnets. Furthermore even though every magnet was thoroughly tested individually, they were never tested with the exact configuration that they would have when installed at CERN--thus missing the opportunity to discover the problem sooner.

It is very important for our institution that while we are on the world stage we also demonstrate how we deal with adversity. We have given the top priority in our laboratory to helping CERN fix the problem; we will do everything that is necessary to minimize the impact to the LHC schedule. We also appreciate the offers of assistance that we have received from our partner laboratories

Tuesday, April 3

- Golden broccoli & cheese
- Cheesy Greek squeeze
- Coconut crusted tilapia
- Spaghetti w/meatballs
- Toasted almond chicken salad on croissant
- Assorted slice pizza
- Chicken fajitas

[Wilson Hall Cafe Menu](#)

Chez Leon**Wednesday, April 4
Lunch**

- Ropa Viejas (Flank Steak Shredded)
- Sweet Plantain Mash
- Coconut Cake w/Lime Filling

**Thursday, April 5
Dinner**

- Stuffed Multicolored Peppers
- Pork Medallions w/Cider Sauce
- Greens w/Cannellini Beans
- Almond Butter Cake

[Chez Leon Menu](#)

Call x4598 to make your reservation.

Archives

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[Result of the Week](#)

[Safety Tip of the Week](#)

[ILC NewsLine](#)

Info

Fermilab Today is online at: www.fnal.gov/today/

Send comments and suggestions to: today@fnal.gov

Feature**Bhat new secretary-treasurer of APS physics-society forum**

Pushpa Bhat hopes the APS Forum on science and society will increase public awareness of science.

Fermilab physicist Pushpa Bhat was recently elected Secretary Treasurer of the American Physical Society's Forum on Physics and Society. She will officially assume her role in April during the APS meeting in Jacksonville, Florida, along with other newly-elected forum officials.

The forum was established in 1971 to address issues at the interface of physics and society as a whole. With more than five thousand members, the forum considers issues related to energy production, the environment, weapons proliferation and the public understanding of science. As Secretary-Treasurer, Bhat will maintain records and finances for the forum, notify the chair of issues that require executive committee action and disseminate information to the forum's membership. She hopes to emphasize the importance of public participation in science. "Science popularization is one of my biggest issues," Bhat said, "and the future of science research in this country stems from the public's understanding and appreciation."

At the forum's regular sessions, experts speak on such vital issues as the energy crisis and arms control. Bhat says these meetings offer forum members, other experts and invited government officials a chance to learn about the scientific and societal implications of certain policies. She also hopes to help plan more public events offering "regular people" the chance to learn about the role of basic research in technology and society. "I think there are a lot of people who are interested in the value of basic research -- who want to express their opinion and give feedback," Bhat said. "Science has mostly been curiosity-driven, yet has produced technology that we

KEK, BNL, LBNL and ANL.

Beyond the immediate fix we must reflect on how we got into this mess. To have the benefit of independent eyes we will have an external review of the events that transpired from the beginning of the design. We need and want to make sure that we find the root causes of the problem and from the lessons learned build a stronger institution. Beyond that, there is no substitute for the commitment each of us makes to excellence, to critical thinking and to sweating every detail.

Accelerator Update**March 30 - April 2**

- Two stores provided 33 hours and 18 minutes of luminosity
- TeV suffers two quenches, store 5315 lost
- Booster and Pbar have kicker problems
- H- Source trips continue
- TeV sector B3 bus work cabinet faulted
- 12 hour shutdown for CDF on 4/3/07

[Read the Current Accelerator Update](#)

[Read the Early Bird Report](#)

[View the Tevatron Luminosity Charts](#)

Correction

Yesterday's article on fishing incorrectly stated that employees may fish in the Main Ring. That is incorrect. The Main Ring pond is off limits to everyone. It is correct that fishing in the Main Injector pond is restricted to employees. *Fermilab Today* regrets the error.

Announcements**NuInt '07**

The fifth international workshop on neutrino-nucleus interactions in the few-GeV region will be held at Fermilab May 30-June 3, 2007. To register and for more information, visit the NuInt07 [web page](#).

The Next Fermi Kyuki-Do Martial Arts Class begins on April 9

Kyuki-Do combines the strikes of Taekwon-Do, the throwing and grappling techniques of Judo and Jujitsu, the joint locks of Hapki-Do, and the practice of Kobudo (traditional weapons) into one art. Classes are held on Monday and Wednesday from 5 - 6 p.m. at the Recreation Facility in the Village. Teacher Bruce Worthel will focus on a practical self-defense that can be used by women or men. You will learn kicks, blocks, hand techniques, throws, pins, self-defense, and forms that will teach you balance, power, and grace. Register

rely on today. The famous example that we always give is the discovery of the electron. Who knew then that it would be so central to all of our modern gadgets?"

--Siri Steiner

In the News

From *Nature.com*

April 3, 2007:

Magnet failure could delay hunt for Higgs

Fermilab admits it is to blame for design fault.

Construction of the world's most powerful particle collider has been hit by the sudden failure of a key part of the device.

The Large Hadron Collider (LHC), based at CERN, the European Laboratory for Particle Physics in Geneva, Switzerland, is due to start generating data in the summer of 2008. It will smash protons together in collisions that are expected to be energetic enough to identify the Higgs boson, the particle thought to endow all others with mass.

[Read more](#)

through the Recreation Office; classes cost \$45 per 6-week session. You must be a member of the recreation facility to join.

Adobe Acrobat 7.0 Professional: Advanced

During this one-day session, Fermilab employees will learn to convert technical documents to PDF files, enhance and control PDF content accessibility, customize PDF documents for interactive use, and prepare PDFs for commercial printing. For more information or to enroll, visit the online [class schedule](#).

[Upcoming Activities](#)