Calendar

Have a safe day!

Friday, Feb. 19
2 p.m.
Particle Astrophysics Seminar - One West (NOTE DATE and TIME)
Speaker: Mark Devlin, University of Pennsylvania
Title: Where Did Half the Starlight in the Universe Go?
3:30 p.m.
DIRECTOR'S COFFEE BREAK - 2nd Flr X-Over
4 p.m.
Joint Experimental-Theoretical Physics Seminar - One West
Speaker: Yoshinori Kurimoto, Kyoto University
Title: Neutral Current Neutral Pion Production by Neutrinos at SciBooNE
8 p.m.
Fermilab Lecture Series - Auditorium
Tickets: $7
Special viewing of the film "BLAST!"
NOTE: Pre-film discussion with Mark Devlin, cosmologist, at 7:30 p.m.

Monday, Feb. 22
2:30 p.m.
Particle Astrophysics Seminar - One West
Speaker: C. Eric Dahl, Fermilab
Title: A COUPP Update: Acoustic Discrimination Results and Progress on the 60kg Bubble Chamber
3:30 p.m.
DIRECTOR'S COFFEE BREAK - 2nd Flr X-Over
4 p.m.
All Experimenters' Meeting
Special Topic: Optimization of Antiproton Injection to the Recycler Curia II

Click here for NALCAL, a weekly calendar with links to additional information.

Fermilab Special Result of the Week

SciBooNE searches for neutral pions

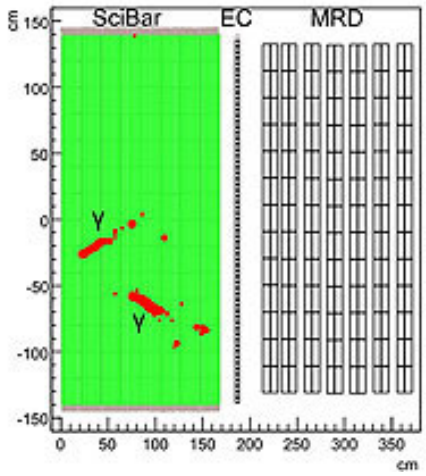

Figure 1. An event display showing a typical π^0 interaction in the SciBooNE detector. Each red dot represents energy deposited in one detector channel. The SciBooNE analyzers use the positions and sizes of the energy deposits to reconstruct the directions and total energies of the particles whose passage caused the tracks to develop. In a typical π^0 event, the pions decay to two photons. Those photons subsequently convert to electron–positron pairs that leave tracks, as shown in this display. The tracks point back to the position of the π^0 decay.

Detecting the ghostly neutrino is never an easy task, especially if its interaction produces another neutral particle, the neutral pion, or π^0. But detecting the neutral pion produced by neutrinos is just what the SciBooNE collaboration has achieved.

The trick is knowing what the neutral particles are going to do once they appear in the detector. Neutral pions decay very quickly into two photons, which can be detected, as shown in Figure 1. By finding the tracks left by the photons and checking if they can be reconstructed into a particle with the mass of a pion, SciBooNE analyzers, led by Yoshinori Kurimoto of Kyoto University, identified hundreds of these elusive events.

Once they found the events, the analyzers calculated the probability for neutrinos to interact in this way. They then further refined the data and carefully studied the properties of

Recovery Act Feature

DOE supports bold move by young physicist


Rupak Mahapatra

The Department of Energy has granted an Early Career Research Award to Rupak Mahapatra, assistant professor at Texas A&M University and member of the Cryogenic Dark Matter Search experiment.

DOE received $85 million in funding from the American Recovery and Reinvestment Act to use the award to support outstanding young scientists. The Office of Science peer-reviewed about 1,750 proposals and chose just 69 winners.

Mahapatra received $750,000 to support his research in developing the technology for a ton-scale, germanium dark-matter detector to be located in the proposed Deep Underground Science and Engineering Laboratory. The experiment, called Germanium Observatory for Dark Matter, GeoDM, is an offshoot of CDMS.

DOE gave Mahapatra the news on Jan. 14, his daughter Samikshya's second birthday. On that date two years earlier, DOE had been reviewing Mahapatra's project. "I gave a talk from the hospital," Mahapatra said. "In the rush to finish the birth certificate, I spelled her name wrong."

His daughter's name, inspired by Mahapatra's role as CDMS analysis coordinator, translates to "review" or "close inspection." Luckily, other members of the GeoDM collaboration took that meaning to heart and pointed out the error.

"He's very excited about doing new things," said Dan Bauer, head of CDMS, who has worked with Mahapatra since 1998.

With help from industry, Mahapatra is developing the capacity to construct about 300 to 400 10-pound detectors for GeoDM, either at Texas A&M or a national laboratory like Fermilab or SLAC National Accelerator Laboratory.

Upcoming conferences

Campaigns

Take Five

Tune IT Up

H1N1 Flu

For information about H1N1, visit Fermilab's flu information site.

Weather

Increasing clouds 35°/23°

Extended Forecast
Weather at Fermilab

Current Security Status

Secon Level 3

Wilson Hall Cafe

Friday, Feb. 19
- Breakfast: Chorizo burrito
- Italian vegetable soup
- Teriyaki chicken
- Southern-fried chicken
- Mediterranean baked tilapia
- Eggplant parmesan panini
- Assorted sliced pizza
- Assorted sub sandwich

Wilson Hall Cafe menu

Chez Leon

Wednesday, Feb. 24
Lunch
- Wasabi- and panko-crusted pork loin w/ gingered soy sauce
- Jasmine rice
- Pea pods and carrots
- Cold lime soufflé

Thursday, Feb. 18
Dinner
Closed

Chez Leon menu
Call x3524 to make your reservation.

the pions created by the neutrino interactions, such as the directions in which the pions traveled through the detector, as shown in Figure 2.

Apart from the intrinsic interest of understanding the behavior of nature's quirkiest particle, these measurements provide important input for the T2K experiment in Japan. T2K is searching for muon neutrinos that morph into electron neutrinos, ν^e. This phenomenon, called neutrino oscillation, is the first observation not allowed by the Standard Model of particle physics. T2K and Fermilab's NOvA experiment will use accelerator neutrino beams to search directly for ν^e appearance. If they find it, ν^e appearance could be the first step in understanding why we live in a matter, not antimatter, universe. But in order to find ν^e appearance, the T2K and NOvA scientists will need to understand all the processes that could mimic the particle. The number one culprit is π^0 production.

The SciBooNE measurements of π^0 production, combined with MiniBooNE's recent results on the same topic, finally bring this pesky background process under control. More details on the analysis can be found in SciBooNE's recent publication.

-- Morgan Wascko

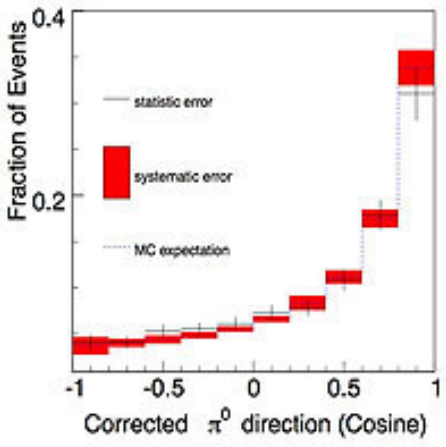

Figure 2. Distribution showing the angles (with respect to the neutrino beam direction) of emitted pions. The data are shown by the black crosses, with the statistical uncertainty indicated by the black error bar. The prediction is shown by the blue dashed line, with the systematic uncertainties indicated by the red bands.

"It's a giant leap in the ability to make these detectors," Mahapatra said. "At the current rate, it would take more than three centuries. Now it will take about a decade."

Eight collaboration members, including three newly hired graduate students, will conduct R&D work for GeoDM for the next two or three years.

-- Kathryn Grim

Special Announcement

Computing update

The Computing Division brought back most of the services and systems that went down on Wednesday after a power outage at Feynman Computing Center. Some remain down or are running at reduced capacity.

If you continue to experience problems, please open a Service Desk ticket.

Announcements

Latest Announcements

Weekly Time Sheets due today

Barn Dance - Feb. 21

Immigration Law information session - March 1

Fermi Martial Arts Classes

Fermilab Family Open House - Feb. 21

Last day of Engineers Week today

BLAST! The Movie: intro, film and Q&A - today

Employee discount offered at Batavia Rosati's

Hiring summer students for 2010

Harlem Globetrotters special ticket price - April 15

2010 standard mileage reimbursement rate

Chicago Bulls discount tickets available online

Introduction to Argentine Tango series of classes - FREE

Archives

Fermilab Today

Result of the Week

Safety Tip of the Week

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

Yoshinori Kurimoto of Kyoto University performed the data analysis.

In the News

The secret lives of particle accelerators

From *PopSci.com*, Feb. 17, 2010

Beneath the French-Swiss border, the Large Hadron Collider will run at half its maximum energy for the next year and a half, as scientists monitor electrical systems that have already forced delays.

At 3.5 trillion electron volts, a half-power LHC will still be three times as powerful as the world's previous atom-smashing king, Fermilab's Tevatron.

The LHC will help scientists seek answers to some of the most profound questions about the universe, including the nature of the elusive Higgs boson, also called (to the chagrin of many physicists) the "God particle," which is thought to endow other particles with mass.

These may be lofty goals, but particle accelerators can also be used for decidedly more down-to-Earth projects -- like fighting cancer, cleaning up industrial waste and even shrink-wrapping your Thanksgiving turkey. More than 17,000 particle accelerators are in operation around the world, used for radial tires, computer chips and 3-D images of molecules, among other tasks.

In honor of the LHC, PopSci takes a look at some other, perhaps more humble uses for these "cathedrals of science."

Read more

Qi Gong, Mindfulness and Tai Chi Easy for Stress Reduction

Unleash those stomach butterflies - Toastmasters

Ukrainian egg decorating class - Feb. 22

Weight Watchers at Work begins new session

Applications accepted for awards in URA Visiting Scholars program

Blood drive sign-up

Ask HR sessions to be held at the Computing Division and Wilson Hall

Conflict Management and Negotiation Skills offered March 3 and 10

Adobe Acrobat Professional 9.0 Level 1 class offered March 4

Deadline for The University of Chicago Tuition Remission Program - March 5

On-site Housing for summer 2010 - March 8 deadline

Adaptive Leadership: Coaching for Individual Differences class - March 9

Art Gallery talk - Virginia Broersma - March 10

Excel Power User / Macros class offered March 11

FRA Scholarship 2010

Submit an announcement

Classifieds
Find new classified ads on *Fermilab Today*.