Fermilab Today

Wednesday, April 28, 2010

Calendar

Have a safe day!

Wednesday, April 28
3:30 p.m.
DIRECTOR'S COFFEE BREAK - 2nd Flr X-Over
4 p.m.
Fermilab Colloquium - One West
Speaker: James Swanson, University of California, Irvine
Title: Evaluation of the Dopamine Hypothesis of ADHD with PET Brain Imaging

Thursday, April 29
2:30 p.m.
Theoretical Physics Seminar - Curia II
Speaker: Monika Blanke, Cornell University
Title: Testing the SUSY Weak Scale Stabilization at the LHC
3:30 p.m.
DIRECTOR'S COFFEE BREAK - 2nd Flr X-Over
4 p.m.
Accelerator Physics and Technology Seminar - One West
Speaker: Sergei Nagaitsev, Fermilab
Title: Toward Super-High Intensity Accelerators

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

Upcoming conferences

Campaigns

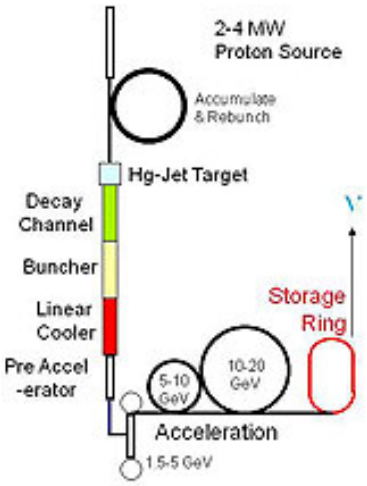
Take Five

Tune IT Up

H1N1 Flu

Feature

Neutrino factory could be right prescription to see theta$_{13}$



Design schematic: 20 GeV NF
(Phys. Rev. ST Accel. Beams 9, 011001 (2006))

Scientists would use a neutrino factory to smash protons into a target, collect muons resulting from the collision, cool them to similar energies and momenta, accelerate them and let them decay into neutrinos.

Most neutrino experiments running today have one thing in common: They are trying to pin a number on a parameter known as theta$_{13}$, or θ_{13}.

This number may simply equal zero. But if it doesn't, it might tell physicists something about the role of neutrinos in the imbalance between matter and antimatter in the universe, the reason we exist.

Physicists have put tighter and tighter constraints on the number. A recent result from the MINOS collaboration at Fermilab allowed them to push the limits previously set by the CHOOZ experiment in France. If θ_{13} is very small, it could take a new type of neutrino experiment to find it: a neutrino factory.

Sixty-four physicists from 30 American and European institutions met at Fermilab in early April as part of an international design study with a goal of creating a design report for a neutrino factory in the next few years. The report will include a recommended design and cost estimate and will open the door for a laboratory to propose to build a neutrino

From the Business Services Section

A greener fleet

Dave Carlson, head of the Business Services Section, wrote this week's column.


Dave Carlson

Our planet naturally seeps and sometimes spews forth massive amounts of greenhouse gases, primarily carbon dioxide and methane. Since the 19th century it has been known that these and other greenhouse gases trap heat in the atmosphere and cause heating of the Earth's surface.

Throughout geologic history the Earth's natural processes have been the dominant factor in the planet's level of atmospheric greenhouse gases. Since the start of the industrial revolution, human activity has steadily increased those greenhouse gas levels. It is believed that this is causing a worrisome increase in the Earth's surface temperature.

Although carbon dioxide is not the greenhouse gas with the strongest and most long-lasting effect, it is the most abundant. Fossil-fuel burning power plants, factories and heating systems are the largest man-made sources of carbon dioxide emissions; operation of fossil-fuel powered transportation is second. Another contribution is the removal of carbon traps in the environment through deforestation and changes in land use.

One goal of President Obama's Executive Order 13514, "Federal Leadership in Environmental, Energy, and Economic Performance," is that federal fleets will lead by example to help "create a clean energy economy that will increase our nation's prosperity, promote energy security, protect the interests of taxpayers, and safeguard the health of our environment." Federal fleets will work toward this goal by reducing fleet greenhouse gas emissions through less petroleum consumption. Three key strategies are in play:

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

Weather

Sunny
63°/42°

Extended Forecast
Weather at Fermilab

Current Security Status

Secon Level 3

Wilson Hall Cafe

Wednesday, April 28
- Breakfast: English muffin sandwich
- Beef barley soup
- Gyros
- Caribbean grilled salmon
- Stuffed pepper
- Beef and cheddar panini
- Assorted sliced pizza
- Grilled chicken bowtie w/ tomato cream

Wilson Hall Cafe Menu

Chez Leon

Wednesday, April 28
Lunch
- Crab cakes w/ red pepper mayonnaise
- Lemon orzo
- Carrot cake

Thursday, April 29
Dinner
- Closed

Chez Leon Menu
Call x3524 to make your reservation.

Archives

factory.

Neutrinos come in three flavors and in three masses. A neutrino of one mass is actually a mixture of the three flavors. It spends some portion of its time as an electron neutrino, some as a muon neutrino and some as a tau neutrino. Switching from flavor to flavor is called oscillation.

Physicists think that all three masses of neutrinos follow this pattern, each with a different recipe for how much time it spends as each flavor. But they have not observed every possible type of oscillation.

Theta$_{13}$ is a measure of how often electron neutrinos oscillate into tau neutrinos. If this type of oscillation happens at all, θ_{13} will be larger than zero. But if θ_{13} is a very small number, today's neutrino experiments may not have the precision to find it.

"Then the neutrino factory looks interesting," said Fermilab physicist Alan Bross, co-spokesperson for the Neutrino Factory and Muon Collider collaboration.

"It's like a new pair of glasses," said Vladimir Shiltsev, director of Fermilab's Accelerator Physics Center. "So you can read what Mother Nature wrote in her book."

Read more

-- Kathryn Grim

Special Announcement

Fermilab to host annual Farmers' Picnic Saturday

George VanVleet (left center), visited his farm house in its current location at Site 56 on Eola Road during the 2009 Farmers' Picnic. He was joined by his son, John, his grandson, Adam, and his wife, Betty.

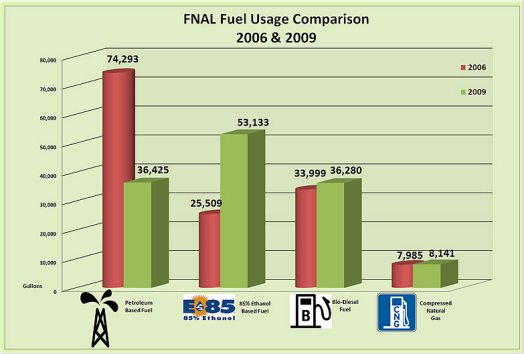
Fermilab will host its 13th annual Farmers'

- reduce vehicle miles traveled,
- increase fleet fuel efficiency and optimization measures, and
- replace petroleum with alternative fuel.

Federal fleets have to reduce petroleum consumption by 2 percent each year from a FY2005 baseline through FY2020.

Fermilab is well on its way to increasing its fleet-fuel efficiency, using alternative-fuel vehicles and replacing petroleum with alternate fuels, including biodiesel, alcohol and natural gas.

Fermilab's efforts will help slow the buildup of atmospheric greenhouse gases. While we do our part to control the human contribution, we should humbly keep in mind that at any time the Earth may decide differently and discharge massive amounts of greenhouse gases.



Change in Fermilab's fuel usage from 2006 to 2009. Fermilab is increasing its fleet-fuel efficiency and uses alternative fuels.

Special Announcement

Password Doctor booth available today

By May 5, IMAP users who use e-mail clients such as Outlook, Entourage and Thunderbird must ensure that those clients are set to encrypt passwords to keep e-mail communication secure. Instructions for adjusting the settings of multiple e-mail clients are available here. The process usually takes less than 10 minutes. If you have questions or need help, please visit representatives from the Service Desk at the Password Doctor booth during lunch hours today through May 5. You can also contact the Service Desk at x2345 for assistance.

Safety Update

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

Unsubscribe from *Fermilab Today*

Picnic at noon on Saturday, May 1, in Kuhn Barn. The annual potluck-style celebration usually attracts about 100 guests most of whose family farms used to occupy the Fermilab site. For more information, view the invitation (pdf) or call (630) 840-8640.

In the News

Evidence grows for tetraquarks

From ***Physicsworld.com***, April 27, 2010

The existence of a new form of matter called a tetraquark has been given further support by the re-analysis of an experiment that has baffled particle physicists for the past two years.

In 2008 researchers on the BELLE experiment at the KEK Laboratory in Japan looked at how an excited state of the meson "bottomonium" decayed and were very surprised to find that one particular decay mode was much more common than expected.

Now, physicists in Germany and Pakistan have proposed an extraordinary explanation – instead of producing bottomonium, the experiment had created a new particle containing four quarks. If such tetraquarks do exist, it would lead to an extended quark model of exotic particles. It would also give physicists a deeper understanding of quantum chromodynamics (QCD) – the Standard Model's theory of quarks and the strong force that binds them together.

Read more

ES&H weekly report, April 27

This week's safety report, compiled by the Fermilab ES&H section, includes no new injuries. Find the full report here.

Safety report archive

Announcements

Latest Announcements

Outdoor soccer league - May 4

Ask HR in Wilson Hall atrium - today

Argentine Tango through today - Student discount available

English country dancing -May 2

Next yoga session begins May 4

Celebrate National Humor Month

Toastmasters meet in cafeteria - May 4

IMAP users: Configure your e-mail client by May 5

National Lab Day 2010

FORE! The 2010 golf season is about to hit you

SciTech summer camps start June 14

Butts & Guts class - sign up now

Employee discount at Batavia Rosati's

Country House discount for Fermilab employees

Qi Gong, Mindfulness and Tai Chi Easy for Stress Reduction

Fermilab Arts Series presents Leo Kottke - May 8

Fermilab Arts Series presents Corky Siegel and Chamber Blues June 26

AutoCAD Intermediate classes - June 22 - 24

AutoCAD Fundamentals class - June

8 - 10

Calling all softball players

ANSYS Mechanical Application classes - May

Additional activities

Submit an announcement