Fermilab *Today*

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Calendar

Have a safe day!

Thursday, Aug. 19
8 a.m. - 8:15 p.m.
Hadron Collider Physics Summer School - One West
2:30 p.m.
Theoretical Physics Seminar - Curia II
Speaker: Jay Wacker, SLAC National Accelerator Laboratory
Title: It's On! Using ATLAS' First Results on Jets and Missing Energy Searches
3:30 p.m.
DIRECTOR'S COFFEE BREAK - 2nd Flr X-Over
THERE WILL BE NO ACCELERATOR PHYSICS AND TECHNOLOGY SEMINAR THIS WEEK

Friday, Aug. 20
10 a.m.
Computing Techniques Seminar - Hornet's Nest, WH8XO
Speaker: Sebastien Goasguen, Clemson University
Title: Cloud Computing Concepts and Experiences
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.

Upcoming conferences

Campaigns

All-hands meeting at 11:15 a.m. today in Auditorium

As part of his visit to Fermilab today, Department of Energy Deputy Secretary Daniel Poneman will hold a 30-minute all-hands meeting and Q&A beginning at 11:15 a.m. in Ramsey Auditorium. Poneman will discuss the work conducted at Fermilab and new efforts across the DOE complex. During the Q&A session, Poneman would like to hear directly from employees and answer their questions.

Feature

Fermilab's first Particle Physics Photowalk a success

Participants in Fermilab's Particle Physics Photowalk take pictures of the Cockroft-Walton pre-accelerator on Saturday, Aug. 7.

For those who see it every day, Fermilab's good looks are nothing new. But for those who don't, the laboratory has been a hidden treasure of visual gems – until recently.

Responding to Fermilab's invitation to capture its visually appealing parts, 49 photographers converged on laboratory grounds on Aug. 7 for its first Particle Physics Photowalk. It was a hit.

"Everyone I talked to wants to be at the top of the list for the next one," said participant Tony Reynes from Wilmette, Ill.

The event's success is owed to its organizers, Reidar Hahn and Kurt Riesselmann. They, along with 25 Fermilab employees who volunteered their Saturday mornings to the outreach effort, directed photographers in and out of five laboratory facilities: the Antiproton Source, the Linac, the superconducting radio-

Looking for new physics

The popular "Where's Waldo?" series of children's books illustrates the main point of this week's article. The Waldo on the left is hidden in the clutter, while the isolated one on the right is much easier to find. *TM & © 2008 Entertainment Rights Distribution Limited. All rights reserved.*

So, just how do we look for new physical phenomena in Tevatron data? One way is the approach we use in the search for the Higgs boson. In that case, there are clear theoretical predictions about how the particle will decay if it exists. We then go to look for that type of decay and verify or refute its existence.

However, this search strategy is limited by our predictions. To look for something totally unexpected, we make careful measurements of event types that we consider interesting. We start from known theories, calculate how often these kinds of collisions occur and look for unexpected excesses. If we see more than we expect, we've found something. At that point, we can start to work out exactly what it is that we've found.

As we sift through our data, we need to use our most efficient search strategies. One such strategy is to look for the types of collisions that well-established theories predict to be nearly impossible. That makes rare new phenomena easier to spot, much like how a dirty and smelly dish stands out on an otherwise empty table but might get lost in the clutter of a teenager's room. Of course, we have to be careful and only search for things that are at least possible. After all, the Standard Model predicts that we won't find something truly crazy in our data (such as unicorns), so searching for them isn't a worthwhile thing to do.

frequency test accelerator at New Muon Laboratory, the Test Beam Facility at the Meson building, and AZero.

Docents guided participants as they zoomed and snapped their way around magnets and cryostats. Scientists were on hand to address photographers' questions and ensure the safety of everyone involved.

"The people in the labs were great, full of information," said participant Dana Carnett of Hampshire, Ill. "It sounds goofy to say they provided good customer service, but that's what it was."

The photographers, who came from as far away as Italy, had the opportunity to explore laboratory areas not typically open to the general public.

"I happen to be someone who loves mechanical, rusty and metallic stuff. I had no idea whether I'd find things like that at Fermilab," Reynes said. "I got there, and I must have some mechanical genes in me, because I felt there was eye-candy everywhere."

The photowalk was part of an international endeavor by five high-energy laboratories to reach out to amateur and professional photographers. All are hosting local photowalk photo contests, and each will submit selected photos for a global competition. The *CERN Courier* and *symmetry* magazine will publish the winning photographs.

"The main thought I walked away with was, 'What a secret.' Fermilab is in our backyard, but we had no sense of what it was," Reynes said.

View images from the five international photowalks on the Flickr site.

-- Leah Hesla

Photo of the Day

This result of the week describes a search for two photons and missing energy. The Standard Model predicts events like these to be uncommon. Events with missing energy usually indicate the presence of a rare neutrino and events with neutrinos and two photons are very rare. However, we can identify photons very accurately, and we find events with missing energy to be intrinsically interesting. If we do find these kinds of events, we'll be onto something. They could indicate supersymmetry, dark matter, extra dimensions of space, violations of long-held conservation laws, or something else entirely.

The result was consistent with our expectations, so we did not observe any new physics. However, the measurement did rule out some proposed theoretical models, and we have boosted our confidence in the Standard Model.

- Don Lincoln

Mark Cooke   John Parsons
These physicists from Columbia University performed this challenging analysis

DZero's mechanical crew members were very busy during the scheduled month-long shutdown that just ended. They safely performed all the tasks necessary to make the shutdown successful and will now return to supporting DZero's ongoing operations.
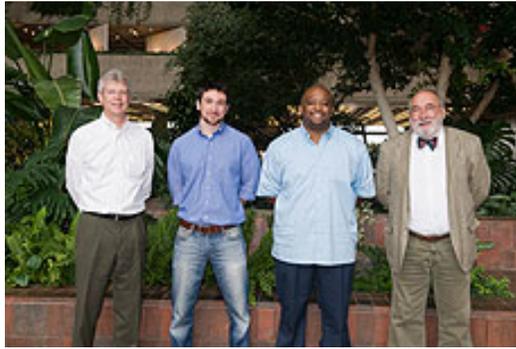
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New employees - Aug. 9

From left: Tracy Lundin, PPD; Matthew Buckley, PPD; Michael Henry, Jr., AD; Giovanni M. Piacentino, PPD.

Special Announcement

Thursday's volunteer cleanup rescheduled for Aug. 26

Due to the scheduling conflict with Thursday's all-hands meeting, the volunteer cleanup originally scheduled for this Thursday has been cancelled. The cleanup will take place next Thursday, Aug. 26. Please contact Roads and Grounds at x3303 with any questions.

In the News

Lasers could make virtual particles real

From *New Scientist*, Aug. 17, 2010

Next-generation lasers will have the power to create matter by capturing ghostly particles that, according to quantum mechanics, permeate seemingly empty space.

The uncertainty principle of quantum mechanics implies that space can never be truly empty. Instead, random fluctuations give birth to a seething cauldron of particles, such as electrons, and their antimatter counterparts, called positrons.

These so-called "virtual particles" normally annihilate one another too quickly for us to notice them. But physicists predicted in the 1930s that a very strong electric field would transform virtual particles into real ones that we can observe. The field pushes them in opposite directions because they have opposite electric charges, separating them so that they cannot destroy one another.

Read more

Latest Announcements

Fermilab Lecture Series presents "A Croc Odyssey: Speedy Gallopers with a Taste for Dinosaur"

International Folk Dancing in Ramsey Auditorium through Sept. 2

Scottish country dancing in Ramsey Auditorium through Aug. 31

Fermilab Time and Labor system downtime from noon 8/21 until 5 p.m. 8/22

Toastmasters - today

Fermilab blood drive Aug. 30 and 31 (walk in only)

H1N1 Temporary Sick Leave policy removed

Argentine Tango, Wednesdays through Aug. 25

Bristol Renaissance Faire discount

Aug. 20 deadline for The University of Chicago Tuition Remission Program

Applications for URA Visiting Scholars Awards due Aug. 20

Regal Movie Theater discount tickets available

What's New with NI and the latest version of LabVIEW (NI Week highlights)? - today

Gizmo Guys - Fermilab Arts Series - Sept. 25

Submit an announcement