

Calendar

Thursday, July 6

2:00 p.m. ILC Detector R&D Meeting - West Wing (WH-10NW)

Speaker: R. Yarema, Fermilab

Title: Fermilab Initiatives in 3D Integrated Circuits and SOI Design for HEP

3:30 p.m. DIRECTOR'S COFFEE

BREAK - 2nd Flr X-Over

-There will be no Theoretical Physics

Seminar this week

-There will be no Accelerator Physics and Technology Seminar

Friday, July 7

3:30 p.m. DIRECTOR'S COFFEE

BREAK - 2nd Flr X-Over

4:00 p.m. Joint Experimental Theoretical Physics Seminar - Curia II (note location)

Speaker: A. Drutskoy, University of Cincinnati

Title: Results from the U(5S) Engineering Run at Belle

Saturday, July 8

8:00 p.m. Fermilab Arts Series: Pat

Donohue and Howard Levy - Auditorium

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

Weather



Sunny **81°/55°**

[Extended Forecast](#)

[Weather at Fermilab](#)

Current Security Status

Peterson pursues purplish copper butterfly at Fermilab



The purplish copper butterfly has nearly reached "threatened" status in Northern Illinois. An expedition of conservationists searched for the rare species in Fermilab marshlands last Wednesday. (Click on image for larger version.)

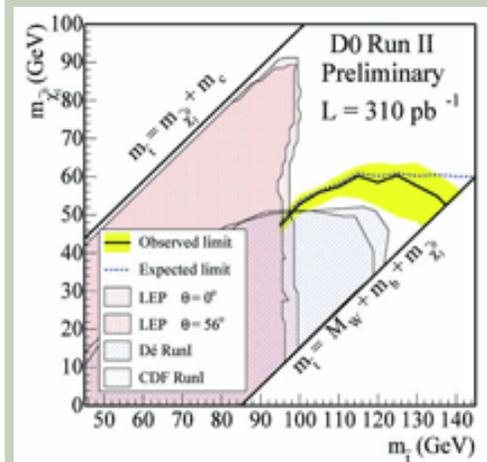
Hidden among more than a thousand acres of prairie, rare purplish copper butterflies flutter about Fermilab. In a watery marsh just east of Kautz Road, Tom Peterson of the Technical Division led a small expedition of conservationists from the Notebaert Nature Museum last Wednesday to search for the elusive insect. Although the group found no purplish coppers during their outing, Vincent Olivares, butterfly laboratory supervisor at the museum, says he will return in mid-July to try again to capture a few females in order to start a breed-and-release program for the butterfly.

"Butterflies, including the purplish copper, are important pollinators and help plants to spread," Olivares said. "They're also an important part of the food chain."

While breeding the butterfly year-round at the museum, Olivares hopes to secure grant funding and release the purplish copper into restored prairies with marshy

Fermilab Result of the Week

DZero searches beyond SM physics with acoplanar jets



Exclusion domains in the plane of the stop and neutralino masses, where the stop is the supersymmetric partner of the top quark and the neutralino is the lightest supersymmetric particle. Here, the stop is assumed to decay into a charm quark and a neutralino.

In the proton and antiproton collisions at the Tevatron, the interaction of the beam particles occasionally results in parton (quarks and gluons) emission at a large angle transverse to the beam direction. These partons turn into sprays of particles, or jets, which can be detected in the DZero apparatus. Momentum conservation implies that if only two jets are produced, they should appear back-to-back in the plane transverse to the beam (coplanar). If additional invisible particles (such as neutrinos or something unexpected) are present in the final state, the two jets may not satisfy this condition. Any excess of acoplanar-jet events could indicate physics beyond the Standard Model (SM) of particle physics.

This search is somewhat unique as it provides a probe of two different beyond-

[Secon Level 3](#)**Wilson Hall Cafe****Thursday, July 6**

- Tomato Florentine
- Grilled Chicken Cordon Bleu Sandwich
- Chimichangas
- Chicken Marsala
- Smoked Turkey Melt
- Assorted Slice Pizza
- SW Chicken Salad with Roasted Corn Salsa

[Wilson Hall Cafe Menu](#)**Chez Leon****Thursday, July 6****Dinner**

- Beet and Roquefort Salad w/Walnuts
- Steak Au Poivre
- Roasted New Potatoes w/Garlic and Rosemary
- French Green Beans
- Blueberry Shortcake

Wednesday, July 12**Lunch**

- Roasted Vegetables and Cheese Strudel
- Vanilla Custard w/Blueberry Sauce

[Chez Leon Menu](#)

Call x4598 to make your reservation.

Search**Search the Fermilab Today Archive****Info**

areas, the purplish copper's natural habitat. "It would be nice if Fermilab can be a source of native butterflies to be reintroduced into the habitats where they formerly lived," Peterson said about the program. "[Purplish] coppers were almost wiped out by the draining of wetlands across the country and have declined quite a bit in the Midwest and especially east of Illinois."

As a cryogenic engineer busy helping with International Linear Collider proposals, Peterson says he ventures into Fermilab wilderness whenever he can. "There's actually a very small window for finding purplish coppers. It has to be a nice day, the right time of day and right time of year," Peterson said. "For me, there may only be a few opportunities during the [butterfly] season." Although the expedition itself proved disappointing, Peterson says persistence--and luck--is helpful when looking for something in nature. "You don't want to be too arrogant thinking you know everything about nature," Peterson said. "It's always bound to be full of surprises."

Click [here](#) for more information about the Notebaert Nature Museum. More Fermilab butterflies can be found at [Peterson's butterfly Web site](#).

--Dave Mosher

the-SM theories. One of these extensions to the SM is "supersymmetry." This theory introduces a new symmetry between fermions and bosons which gives rise to a prediction of "superpartners" for all known particles. For instance, the top quark gains a partner called the "stop," which is expected to decay into a quark and a new invisible particle (a dark matter candidate). Stop pair production would therefore lead to an acoplanar-jet topology not predicted by the SM.

In the second model, the intriguing symmetry between quarks and leptons (the generic name for neutrinos and electron-like particles) is given meaning by a new interaction mediated by "leptoquarks" (LQs). Such LQs could be pair produced at the Tevatron, and their decay into a quark and a neutrino would lead to acoplanar-jet events.

The DZero collaboration has performed an analysis of acoplanar-jet events, and found no excess beyond the expectations from the SM, thus setting improved limits on the masses of stops and LQs. This analysis was based on two years of data from Run II, and it is expected that the impressive performance of the Tevatron will allow a significant extension of the domain of LQ and stop masses probed.

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Meson satisfies childhood curiosity with adult muse



San Francisco artist Dawn Meson with "Condensate" (left) and "Calabi Yao" (right).

For artist Dawn Meson, it all started with drawing horses. "I loved horses when I was little," she said at last Wednesday's art opening. "I guess most little girls love horses." But unlike most little girls, Meson's pictures did not feature show ponies--instead she produced careful anatomical studies from books she found lying around the house. "I was more into understanding how horses work, what was under the skin," she said. As an adult, Meson's muse is physics but the old urge lingers: she wants to document her struggle to understand something complicated.

Meson's physics-inspired work gained new direction in the summer of 2003 when she struck up a conversation with a SLAC physicist at a coffee shop in San Francisco. "Three hours of talking about physics felt like minutes. I wanted to paint these concepts that were impossible to grasp," she said. With titles like "Baryogenesis," "Eigenstate" and "Fermionic Entanglement," her new paintings look wispy; thin layers of color without solid borders evoke shapes the viewer has to half-imagine. "It's the way energy fields intersect and can actually influence particles going through them," Meson said about "Quantum Acoustics,"



Above: These analyses were contributed to by Patrice Verdier (IPN-Lyon, top left), Jean-Francois Grivaz (top right), Nikola Makovec (middle left), Laurent Duflot (middle right) (all from LAL-Orsay), Arnaud Duperrin (bottom left), Eric Kajfasz (bottom right) (both from CPP-Marseille).



DZero Database systems are critical: starting with the online data base all the way to the offline analysis data base. Many DZero collaborators are actively developing and maintaining these applications. Located at Fermilab (above, from left): Elizabeth Gallas (Fermilab), Robert Illingworth (Fermilab), Vladimir Sirontenko (Fermilab), Dan Krop (Indiana University). Located at UREJ, Brazil (below, from left): Ana Carolina Assis Jesus, Helena Malbouisson, Luiz Mundim. Not shown: Adam Lyon (Fermilab), Jim Linnemann (Michigan State), Marco Verzocchi (Fermilab), Linda Stutte (Fermilab), Taka Yasuda (Fermilab).

which illustrates forces exerted by a quadropole magnet. "We rely on invisible forces but don't really understand them," she added. "They course through our cell phones, telephone wires, the whole planet when it comes right down to it."

--Siri Steiner

You can see Meson's art on the 2nd floor crossover of Wilson Hall.

Photo of the Day



DZero's Jeremie Lellouch snapped this photo near the Lederman Science Center a few weeks ago. (Click image for larger version.)

In the News

PhysicsWeb, June 30, 2006: From the present to the past

Cambridge physicist Stephen Hawking and his CERN colleague Thomas Hertog have proposed a radical new approach to understanding the universe that studies it from the "top down" rather than the "bottom up" as in traditional models. The approach acknowledges that the universe did not have just one unique beginning and history but a multitude of different beginnings and histories, and that it has experienced them all. But because most of these other alternative histories disappeared very early after the Big Bang to leave behind the universe we observe today, the best way to understand the past, they say, is to trace our knowledge back from the present (Phys. Rev. D 73 123527).

[Read More](#)



[Result of the Week Archive](#)

Accelerator Update

June 30 - July 5

- Five stores provided ~ 86 minutes and 43 minutes of luminosity
- NuMI off due to horn cooling problems
- Store 4805 aborted
- TeV quench in between stores
- Recycler lost small portion of stash
- MI-40 power supply shorted

[Read the Current Accelerator Update](#)

[Read the Early Bird Report](#)

[View the Tevatron Luminosity Charts](#)

Announcements

Pat Donohue and Howard Levy, July 8

Tickets are still available for Saturday's concert featuring Grammy award-winning musicians Pat Donohue and Howard Levy. The show is at 8:00 p.m. in the Ramsey Auditorium. Tickets cost \$15. For more information call 630-840-ARTS (630-840-2787), Fax to (630)-840-5501, or email audweb@fnal.gov.

English country dancing

English country dancing will continue at Fermilab's Barn, generally meeting the last Sunday afternoon of the month, will meet next on Sunday, July 30 at 2 p.m. Please contact folkdance@fnal.gov or call 630-584-0825 or 630-840-8194.

[Upcoming Activities](#)

