Fermilab Today

Friday, July 8, 2005

## Calendar

**Friday, July 8**

**3:30 p.m.** DIRECTOR'S COFFEE BREAK - 2nd Flr X-Over

**4:00 p.m.** Joint Experimental Theoretical Physics Seminar - 1 West

Speaker: G. Hesketh, Northeastern University

Title: Recent Results from DZero

**Monday, July 11**

PARTICLE ASTROPHYSICS SEMINARS WILL RESUME IN THE FALL

**3:30 p.m.** DIRECTOR'S COFFEE BREAK - 2nd Flr X-Over

**4:00 p.m.** All Experimenters' Meeting - Curia II

## Weather

Mostly Sunny **84º/56º**

Extended Forecast

Weather at Fermilab

## Current Security Status

Secon Level 3

## Wilson Hall Cafe

**Friday, July 8**

Cream of Wild Mushroom Soup

Blackened Fish Filet Sandwich $4.85

Southern Fried Chicken $3.75

Fish Mediterraneo $3.75

Eggplant Parmesan Panini $4.85

Pizza Supreme $3.00

Assorted Sub Sandwiches $4.85

The Wilson Hall Cafe now accepts Visa, Master Card, Discover and American

# E-cycling Program Helps Environment, Lab Economy

E-waste is stored in the Property Office warehouse before being recycled. Fermilab recycles 90,000 pounds computers and other electronic equipment per year. (Click on image for larger version.)

Recycling at Fermilab is a much longer process than separating paper and plastic, especially when it comes to the lab's electronic waste. Electronic equipment often contains lead and other hazardous materials that can make traditional disposal or recycling methods difficult and costly. Fermilab's electronics recycling, or e-cycling, program ensures environmental safety and is economically beneficial to the lab.

"Our recycler, Interconn, demanufactures equipment, or breaks it down into its original components," said Jack Kelly, manager of the Property and Inventory Control Department. "Plastics go to a plastic recycler, glass to a glass recycler, etc. The specified recyclers can then sell the components as raw materials, and the excess is recycled completely - none of it ends up in a landfill." Fermilab's e-cycling contract is also economically beneficial, as the lab receives three cents per pound of equipment - which adds up when the

## ILC This Week

# E-166: The Sultans of Spin


A 50 GeV electron beam traveling through the undulator cylinder is transformed into a 10 MeV beam of gamma ray photons before striking a titanum target to create electron-positron pairs. (Click on image for larger version.)

MENLO PARK, Calif.-- On June 6th, the E-166 experiment began taking data at SLAC in the first of two month-long experimental runs. The experiment is designed to produce polarized positron beams, in which most of the positrons spin in the same direction. This technology is an important component in the research and development of the International Linear Collider (ILC).

In the experiment, a 50 GeV electron beam coils through a hollow cylinder, called an undulator, nearly one meter long and only 0.8 millimeters in diameter. The electrons' helical path causes them to release radiation in the form of polarized gamma-ray photons. The photons then hit a titanium target to create polarized electron-positron pairs.

The group is most concerned about the electron beam passing through such a narrow cylinder. If even a thousandth of the beam hits the cylinder's edge, "we're finished," said University of Tennessee collaborator William Bugg. "This is what makes every night exciting," added Princeton University professor Kirk McDonald. As a result, the group uses a SLAC-engineered beam some 45 microns in diameter — approximately the

Express at Cash Register #1.

Wilson Hall Cafe Menu

Chez Leon is now open. Call x4512 to make your reservation.

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lab recycles 90,000 pounds of electronic waste per year.

Argonne National Lab has also joined Fermilab's current e-cycling program. "We store Argonne material here and send it out for recycling because of storage restrictions currently at Argonne," Kelly said. "It's a win-win situation for Argonne," especially because their previous program was costly. Fermilab also benefits from the consolidation of the programs. "We get a greater volume break from the vendor and shipping costs go down [with more equipment to recycle]," explained Eric Mieland, the Recycling Coordinator of ES&H's Environmental Protection Group. "Plus, we already do mail runs to Argonne, so we just piggy-back the electronics pick up onto that."

While Mieland feels that the country's "disposable society" has a long way to go on the road toward sustainability, he knows that Fermilab is on the right track. "From the disposal end, we are already doing many of the right things. We are ahead of the curve," he said.
*--Elizabeth Wade*

## Andersen Shares His Unique Vision of Quantum Universe

The quantum world remains largely a mystery to both the physicists who explore it and to the non-scientists who try to grasp it. Helping both groups in their quest for understanding is Jan-Henrik Andersen and his exhibit *Sized Matter - Perceptions of the Extreme Unseen*, which is currently hanging in the Fermilab Art Gallery. Collaborating with physicists from Fermilab and the University of Michigan, where he is an Assistant Professor, Andersen designed a system

thickness of a human hair — to fill only 5 percent of the undulator's volume.
**read more**
*--Monica Bobra*

**Linear Collider News Archive**

**GDE Director's Corner, July 6, 2005**
Early this morning, I participated in a teleconference of the FALC Resources Group. Today, I will share some information about that meeting and group, as well as my own personal thoughts on the importance of FALC."
**read more**

**In the News**

## From *Physorg.com*, July 7, 2005

**Bottom quarks reveal something of their identity**

Bram Wijngaarden investigated the creation of bottom quarks using the D zero experiment of the particle accelerator at the Fermi lab in Chicago, United States. In this Tevatron particle accelerator, protons and antiprotons collide with each other. Bottom quarks are created as a result of the strong nuclear force that arises during these collisions.

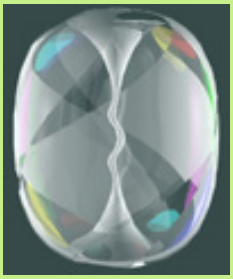
In the 1990s measurements with the Tevatron particle accelerator and with the Hera particle accelerator in Hamburg revealed that the production of bottom quarks was higher than had been theoretically predicted. Since then theoretical physicists have done a lot of work to explain the difference. Wijngaarden's measurements must reveal whether the theory provides a good description of the reality.
**Read more**

to visually represent each Standard Model particle and interactions between them. He explained his method and elaborated on his pieces at the June 29 colloquium, entitled *From Mathematics to Aesthetic Coherence*.


Jan-Henrik Andersen

"The idea was to transform physical properties [of particles] into visual properties. But there is no way to draw an atom on a piece of paper," Andersen explained. As his creative statement says, "One could argue that [subatomic particles] may look like anything, if they have looks at all."

After experimenting with over 20 forms, Andersen based the particles' shapes on a Lamé curve. The basic shapes of the up quark and the down quark are positive and negative versions of the same space, indicating their relationship as first generation particles. Higher generations are represented by adding the basic shapes together, as seen in the second generation charm quark and third generation bottom quark. His



model is also careful to leave room for future discoveries.

Andersen has always been interested in science; growing up in Norway, he explored his uncle's chemistry lab and "spent the week almost blowing it up."

## Announcements

**TeV Particle Astrophysics Conference**
The TeV Particle Astrophysics Conference will take place at Fermilab on July 13 through July 15. Registration is free.
**more information**

**New Classifieds on Fermilab Today**
New classified ads have been posted on Fermilab Today.

**Bristol Renaissance Faire Discounted Tickets**
Discover the Bristol Renaissance Faire: 16 open-air stages, delectable treats from 50 food booths, over 180 high quality arts and crafts shops... The Bristol Renaissance Faire will be in Kenosha, WI from July 9 to September 5, 2005 op Saturdays, Sundays and Labor Day Monday from 10:00 a.m. to 7:00 p.m.(Rain or Shine). Purchase tickets in the Recreation Office.

**Wisconsin Dells Coupon Book Sale**
The Recreation Office is selling the Wisconsin Dells Coupon Book for $15.00. The coupons are good until April 30 of the following year. Interested, check out the sample books in the Recreation Office.

**Fermi Days at Great America in July - $25 Tickets**
Enjoy a day at Great America for only $25.00. The Recreation Office has designated July 9, 10, 23 & 24 as Fermi Days at Great America. Purchase tickets in the Recreation Office for only $25.00 and enjoy one of these days at Great America with your friends and family.

**Upcoming Activities**

Andersen's mathematically based system helped him design visual representations for the Standard Model particles, like this photon. (Click on image for larger version.)

As an industrial designer, he works with science and technology every day to solve problems, just as a scientist does. "Lots of people see boundaries [between art and science] with no good rationale, but finding connections is exciting and illuminating" he said.

*--Elizabeth Wade*