

## Calendar

### Friday, May 6

**3:30 p.m.** DIRECTOR'S COFFEE

BREAK - 2nd Flr X-Over

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

Speaker: V. Khoze, University of Durham

Title: Central Exclusive Production of Higgs Bosons and Other States

**8:00 p.m.** Fermilab International Film Society - Auditorium

Tickets: Adults \$4

Title: Uzak (Distant)

### Saturday, May 7

**8:00 p.m.** Fermilab Arts Series -

Auditorium

Hibiki: A Celebration of Japan's Musical Heritage

Tickets: \$20/\$10

### Monday, May 9

**2:30 p.m.** Particle Astrophysics Seminar - Curia II

Speaker: C. Bailyn, Yale University

Title: Multiwavelength Observations of Microquasars

**3:30 p.m.** DIRECTOR'S COFFEE

BREAK - 2nd Flr X-Over

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

Curia II

Special Topic: Increasing the AP2 and Debuncher Apertures

## Weather



Partly Cloudy **73°/52°**

[Extended Forecast](#)

[Weather at Fermilab](#)

## Fermilab's Saturday Morning Physics Program Marks 25th Anniversary at Graduation Ceremonies on May 14, 2005



Drasko Jovanovic (center) with Saturday Morning Physics Students (Click on image for larger version.)

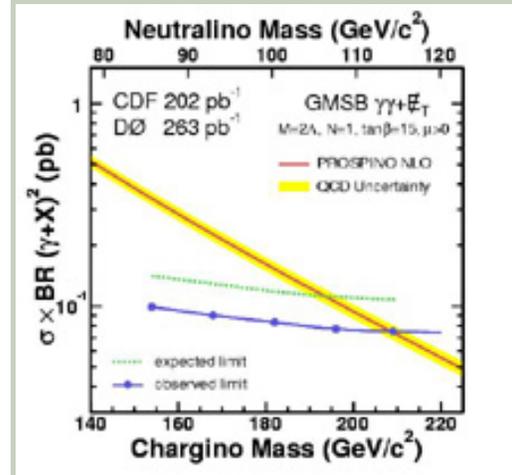
In 1979, then-Director Leon Lederman of the Department of Energy's Fermi National Accelerator Laboratory decided he wanted to do some teaching again, to regain the contact with young minds he had enjoyed as a professor at Columbia University. The resulting Saturday Morning Physics program at Fermilab has spread immeasurable benefits among some 6,000 high school-aged students over the past 25 years.

Saturday Morning Physics, founded by Lederman and physicist colleague Drasko Jovanovic, celebrates its 25th anniversary on Saturday, May 14, 2005 when the current class graduates at 11 a.m. in the One West conference room of Fermilab's Wilson Hall. Media representatives are invited to attend. Jovanovic directed the program until his retirement in 1997.

Roger Dixon, Head of Fermilab's

## Special Physics Result

### Spirit of Collaboration



Combination of the CDF and DZero limits on a Gauge-Mediated Supersymmetry breaking model using the di-photon and missing transverse energy data. The combined limit excludes a lightest neutralino mass less than 114 GeV and this result is the world's best limit on the neutralino mass to date. (Click on image for larger version)

Experimental High Energy Physics is a competitive field. The spirit of competition helps collaborations make detectors operate more efficiently and produce higher quality analyses faster. But the ultimate goal of physicists is to learn about the world we live in. That's why members of the CDF and DZero collaborations get together to combine the measurements to improve the results.

Both experiments have recently published searches for new physics in di-photon events with large missing transverse energy (CDF and DZero). Many models predict an increased production of such events, and both experiments had seen quite unusual events (CDF and DZero). However, there is not enough evidence that these events are inconsistent with coming from Standard Model processes. While this is certainly disappointing, these

## Current Security Status

[Secou Level 3](#)

## Wilson Hall Cafe

Friday, May 6

Beef Pepper Pot

Buffalo Chicken Wings \$4.75

Cajun Breaded Catfish \$3.75

Sweet & Sour Pork Over Rice \$3.75

Honey Mustard Ham & Swiss Panini  
\$4.75

Double Stuffed Pizza \$3.75

Carved Turkey \$4.75

The Wilson Hall Cafe now accepts Visa, Master Card, Discover and American Express at Cash Register #1.

[Wilson Hall Cafe Menu](#)

[Chez Leon](#) is now open. Call x4512 to make your reservation.

## Search

Search the Fermilab Today Archive

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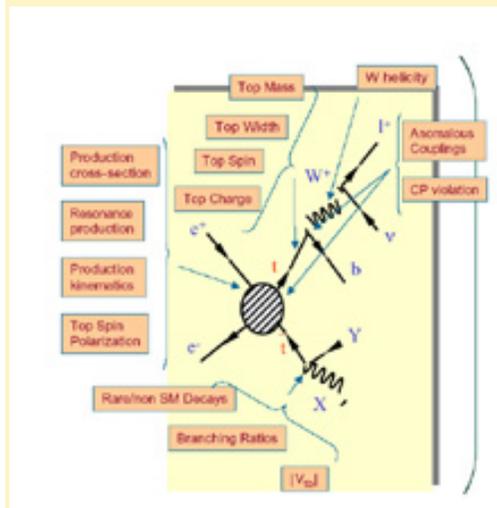
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Accelerator Division, and Erik Ramberg, Test Beam Coordinator for Experimental Physics Projects, have worked as co-directors since then.

[read more](#)

- Mike Perricone

## What's Up with the ILC? Top as the Gateway to New Physics



(Click on image for larger version.)

The top quark is the heaviest elementary particle known. It weighs as much as an entire gold atom, but yet its size is much smaller than a proton, and theorists treat it as a point-like structure. Because of its unique properties the top quark provides a great opportunity to study the fundamental parameters of particles and forces and to look for deviations from the Standard Model. Ultimately, scientists hope that the top quark will shed light on what is known as electroweak symmetry breaking, the mechanism that explains why photons are massless while the Z and W bosons have mass. The Standard Model predicts a single Higgs boson to cause the symmetry breaking, but alternatives exist.

"Many other theoretical models predict modifications to the couplings between top and electroweak gauge bosons," explained Fermilab's Aurelio Juste during

searches can be used to restrict model parameter space and provide important feedback to theorists.

The analysis teams in both experiments kept in touch well before the analyses were complete, making sure that the theoretical assumptions of the analyses were similar. An important model of supersymmetry (SUSY), the so-called Snowmass Slope with Gauge-Mediated SUSY breaking, was chosen to be the model of new physics to test against experimental observations. This early interaction, and invaluable help from Fermilab's Theory Division, assured that the individual results could be properly combined. Recently, the [Tevatron New Phenomena Working Group](#) made public [the combined limit](#) on the effective scale of SUSY breaking, which can be translated into the lower limit on the mass of the lightest neutralino of 114 GeV. This is the best limit on neutralino mass to date and, as expected, it is much better than individual limits from CDF and DZero.

The researchers in both experiments remain hopeful that a definitive sign of new physics will be found as the Tevatron run continues. With candidate events being very rare, it is possible that only a combination of CDF and DZero results would enable a discovery.

his ILC presentation on top quark research last Wednesday. He is one of the leaders of the [Top/QCD Working Group](#) of the American Linear Collider Physics Group. Together with corresponding groups in Europe and Asia, the American Top/QCD group tries to determine how the ILC can unveil these new interactions in different ways than the LHC. "The polarization of the ILC beams is an important tool."

The ILC will produce about 200,000 top quark pairs per year in a "clean" environment. At hadron colliders such as the Tevatron or the LHC, top quark-producing collisions lead to a large amount of "particle debris" that interferes with precise measurements. This noise is mostly absent in the electron-positron collisions of the ILC. But Juste cautioned his colleagues and reminded them of the challenges that an ILC detector must meet.

"Life is not that easy even within the environment of a linear collider," he said. To meet the physics goals, the detector must have precision vertexing; precision global tracking; and optimal calorimetry that connects energy measurements one-to-one with observed particle tracks.

With the right equipment, the ILC detector may even record rare top quark decays that are not allowed or are highly suppressed by the SM. "Observation of such decays would be a clear indication of new physics," Juste said.

Fermilab's [ILC Web site](#) provides a link to the slides of Juste's presentation. The Top/QCD and all other working groups of the American Linear Collider Physics



The authors who worked on the combined CDF and DZero GMSB search results: (clockwise from left) Ray Culbertson (Fermilab), Sung-Won Lee (Texas A&M), Minsuk Kim (KCHEP), Yuri Gershtein (Florida State) and Stephen Mrenna (Fermilab); not pictured are Dong-Hee Kim (KCHEP), Greg Landsberg (Brown), and David Toback (Texas A&M). (Click on image for larger version)

[Result of the Week Archive](#)

## Milestones

### Retired

- Dotti Swanson, LSS, 5/6/05

## In the News

### From the *Chicago Sun-Times*, May 2, 2005

#### Fermilab has 250 trillion reasons to outsource data

by Jim Ritter

Imagine having to wade through enough information to fill a shelf of Encyclopedia Britannicas stretching from Chicago to Pittsburgh.

That's the challenge faced by physicists at Fermilab, the world's most powerful subatomic particle accelerator. Fermilab smashes together subatomic particles at nearly the speed of light in order to better understand the structure of matter and laws of nature.

[read more](#)

## Announcements

Group will meet at [Snowmass](#) from August 14 to 27.

- Kurt Riesselmann

## Sue Hardy Leaves Legacy Of Many Happy Children



Hardy poses with her group, the Lively Lions. (Click on image for larger version.)

Laboratory Services' Sue Hardy, who helped raise generations of Fermilab employees' children, will retire next Friday, May 13th. The Geneva, Illinois native has worked as a child care provider for the lab since December 1985. She received her degree in early childhood education from Southern Illinois University and Elgin Community College. "I love coming to work," said Hardy. "I am one of those really blessed people who can say that they love their job." This is due in part to the wonderful support from the families of the children that attend the day care.

For years, Hardy put on a children's opera in Ramsey Auditorium. The kids performed classic tales such as "Little Red Riding Hood," "The Three Pigs," "Three Billy Goats Gruff," and "Stone Scoop." "The kids did everything, from making the props to memorizing the songs," said Hardy. "It was a delight to watch." Hardy was also an assistant supervisor during the mid 1990's. Her supervisor, Patti Hedrick, said Hardy was also a delight to work with. "She is a

### Fermilab Arts Series

The Arts Series presents "Hibiki: A Celebration of Japan's Musical Heritage" on May 7 at 8:00 p.m. in Ramsey Auditorium. There will be a free pre-concert talk at 7:00 p.m. Tickets are \$20 (\$10 ages 18 and under).

[more information](#)

### Fermilab Film Series

The Fermilab Film Series presents *Uzak* (Distant) at 8:00 p.m. on May 6 in Ramsey Auditorium.

[more information](#)

### New Classifieds on *Fermilab Today*

New [classified ads](#) have been posted on *Fermilab Today*. A permanent link to the classifieds is located in the bottom left corner of *Fermilab Today*.

### Annual NALWO Spring Tea

The annual NALWO spring tea will be held at the Director's house on May 12 from 11:00 a.m. to 1:00 p.m. All women associated with Fermilab are invited.

[more information](#)

### Claim Your Bikes Outside Wilson Hall

Wilson Hall Building Manager John Kent requests all bicyclists to claim their bikes that are located in the Wilson Hall bike rack. Tags will be placed on all of these bikes. Bicyclists must remove the tag and bring it to the ComCenter on the Ground Floor of Wilson Hall. Bikes that are not claimed by May 20 will be removed and relocated to storage. Contact John Kent at x4753 with any questions.

### Fermilab Folk Club Barn Dance

There will be a Fermilab Folk Club Barn Dance on Sunday, May 8 at 6:30 p.m. with music by the Common Taters and

sweetheart, always upbeat and perky," said Hedrick. "The children, their families, and Sue's co-workers are going to miss her a lot."

Hardy, who now lives in St. Charles, will devote time to caring for her mother, who is ill. She and her husband Jim, married 40 years, have two children, Kyle and Erin, and three grandchildren, Olivia, Madelyn, and Sydney.

- *Eric Bland*

calling by Paul Watkins.

[more information](#) [Upcoming Activities](#)