

Calendar

Thursday, July 1

3:30 p.m. DIRECTOR'S COFFEE
BREAK - 2nd Flr X-Over
THERE WILL BE NO ACCELERATOR PHYSICS AND TECHNOLOGY SEMINAR TODAY

Friday, July 2

3:30 p.m. DIRECTOR'S COFFEE
BREAK - 2nd Flr X-Over
4:00 p.m. Joint Experimental Theoretical Physics Seminar - 1 West
Speaker: P. Giromini, INFN, Frascati
Title: Evidence for Pair Production of Jets with an Anomalous Lepton Content at the Tevatron

Wilson Hall Cafe

Thursday, July 1

Minnesota Wild Rice w/Chicken
Tuna Melt on Nine Grain \$4.75
Breaded Veal w/Mushroom Cream Sauce \$2.75
Sweet & Sour Pork over Rice \$3.75
BLT Ranch Wrap \$4.75
Cheesy Breadsticks \$1.85
Toasted Pecan Chicken Salad \$4.75

[Wilson Hall Cafe Menu](#)

[Chez Leon](#)

Weather



Partly Cloudy **85°/61°**

[Extended Forecast](#)

[Weather at Fermilab](#)

Current Security Status

Hill Succeeds Ellis as Theory Head

Today, after more than a decade as head of Fermilab's Theoretical Physics Department, Keith Ellis will step down. Chris Hill, a theoretical physicist and 25-year Fermilab employee, will take over leadership of the department.



Keith Ellis

"Filling Keith Ellis' shoes will be a challenge," said Hill. "He has done a superb job of managing the Theory Group over the past 11 years." While head of the department, Ellis animated the Run II Physics Workshops and led the creation of the prestigious Frontier Fellows program that brings senior theorists to Fermilab for extended visits.

"I'm proud of our lively program for visiting theorists and the enormous success we've had with our postdocs, who have gone on to good positions in the field," said Ellis. "I now look forward to dedicating



Chris Hill

myself full time to my own research."

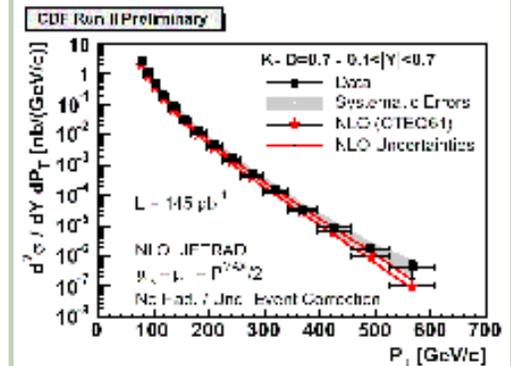
Hill brings a wide range of theoretical interests and a strong background in outreach and

education to the leadership of the department. "It's wonderful to get someone like Chris, who has such

Fermilab Result of the Week

Inclusive Jet Studies

How small is a quark?



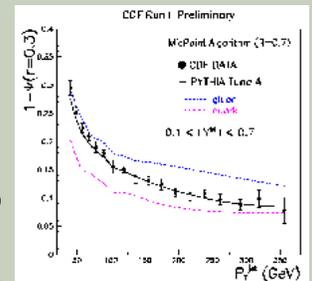
Measured inclusive cross section as a function of jet transverse momentum compared to NLO pQCD predictions. Jets are searched for using the longitudinally invariant K_t algorithm. The red band indicates the theoretical uncertainty. (Click on image for larger version.)

In 460 B.C. the Greek philosopher Democrito introduced the concept of "atom" to explain the nature of matter. Nowadays, we know atoms are made of electrons, protons and neutrons. Protons and neutrons are themselves examples of hadrons: combinations of quarks and gluons as predicted by Quantum Chromodynamics (QCD). Are

quarks elementary particles?

Scientists at Fermilab try to answer this question using the Tevatron: the finest microscope in the world.

At the Tevatron, protons and



Measured fraction of jet energy outside a fixed cone of radius $r=0.3$ as a function of jet transverse momentum. The measurements are compared to phenomenological models for quark- and gluon-jet fragmentation.

Fermilab Today is online at:

<http://www.fnal.gov/today/>

Send comments and suggestions to

today@fnal.gov

[Fermilab Today archive](#)

[Fermilab Today PDF Version](#)

[Fermilab Today classifieds](#)

[Subscribe/Unsubscribe to Fermilab Today](#)

enthusiasm," said Ellis.

"I am very optimistic about the future of elementary particle physics and Fermilab's role as its leader," said Hill.

"The Theoretical Physics Group at Fermilab is a recognized leader in sub-Planck scale physics in the U.S. We compete with key institutions in the field for the best postdocs and associate scientists. My job will be to maintain an environment for such excellence to flourish."

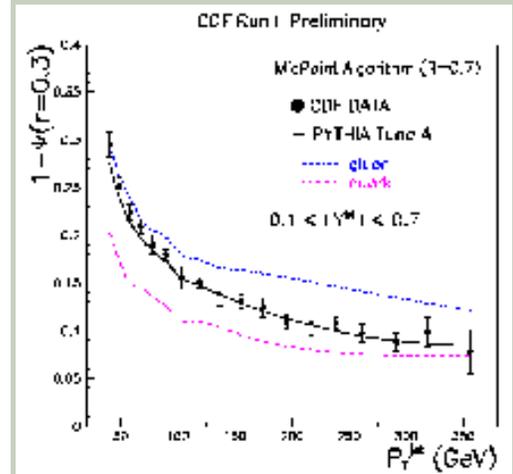
Annual Fermilab-Argonne Ultimate Frisbee Tournament



Ultimate Frisbee players (from left): Ben Nitti (Fermilab), Paul Hubbard and Steve Kurtz (ANL), Doug Moehs and Kip Bishofberger (Fermilab). (Click on image for larger version.)

Last Thursday, June 24, the Fermilab Ultimate Frisbee Club met the Argonne National Laboratory team for their annual tournament. The competition was fierce at the Surrey Ridge Athletic Complex in Lisle, IL. Fermilab controlled the first game, but couldn't withstand a last-minute push from Argonne--the ANL team won 16-14. The second game was also evenly matched, but Argonne again edged out the Fermilab team for an 11-9 win.

antiprotons collide at very high energy. In those collisions, collimated jets of hadrons are produced along the direction of struck quarks and gluons in the final state. The study of the jet energy spectrum allows physicists to search for signals of quark compositeness down to a distance of 10^{-19} m.



Measured fraction of jet energy outside a fixed cone of radius $r=0.3$ as a function of jet transverse momentum. The measurements are compared to phenomenological models for quark- and gluon-jet fragmentation. (Click on image for larger version.)

At CDF the jet energy spectrum has been measured and compared to QCD predictions over almost nine orders of magnitude using two different techniques to reconstruct the jets in the final state. Measurements are at the moment consistent with point-like quarks. Theoretical predictions are, however, dominated by our limited knowledge of both the proton structure and the fragmentation of quarks and gluons into jets of hadrons. For the latter, precise measurements of the jet internal structure have been performed and compared to phenomenological models.

Accelerator Update

June 28 - June 30

- There were no stores established during this 48 hour period. An existing store provided approximately 24 hours and 2 minutes of luminosity to the experiments.
- The TeV suffers a quench just after all protons and antiprotons (from Recycler and Pbar) were loaded.
- TeV sextupole magnet (T:SF) ground faults.

[View the current accelerator update](#)

[View the Tevatron Luminosity Charts](#)

In the News

From the *New Scientist*, June 30, 2004

Speed of Light May Have Changed Recently

by Eugenie Samuel Reich

The speed of light, one of the most sacrosanct of the universal physical constants, may have been lower as recently as two billion years ago - and not in some far corner of the universe, but right here on Earth.

The controversial finding is turning up the heat on an already simmering debate, especially since it is based on re-analysis of old data that has long been used to argue for exactly the opposite: the constancy of the speed of light and other constants.

A varying speed of light contradicts Einstein's theory of relativity, and would undermine much of traditional physics. But some physicists believe it would elegantly explain puzzling cosmological phenomena such as the nearly uniform



Collaboration members involved in the analysis (from left): Regis Lefevre, Olga Norriella and Mario Martinez (IFAE-Barcelona), Gene Flanagan (Michigan State) and Frank Chlebana (Fermilab). (Click on image for larger version.)

Result of the Week Archive

Announcements

Weekly Time Sheets Due Tomorrow

Due to the upcoming July 4th holiday, weekly time sheets are due in Payroll by 10:00 a.m. on Friday, July 2.

Dave Herzog's Marionette Show

The Fermilab Recreational Office presents the Dave Herzog Marionette Show, which will be held in the upper level of Kuhn Barn on July 16 at noon. For 28 years, Dave has performed thousands of shows for audiences nationwide. Dave is a frequent performer at Navy Pier. Not only does Dave perform but he also hand crafts all his marionettes. This event is open to all Fermilab employees, visitors and on-site contractors and their children. This event is free. All we ask is that you do not arrive late. If your spouse is coming from off-site you must notify security.

Housing Request Deadline Today

Reminder: The deadline for Fall 2004/Spring 2005 housing requests is July 1, 2004. Requests may be made by either calling the Housing Office on ext. 3777 or emailing housing@fnal.gov.

temperature of the universe. It might also support string theories that predict extra spatial dimensions.

[read more](#)

Fermilab Singers Concert

Don't forget to mark your calendars for July 7! Take a half hour out of your day to hear your friends and colleagues sing in the Auditorium. It's at noon and the group serves a treat of cookies and cakes following the performance. Don't miss it!