

FermiNews

The Newsletter of the Fermi National Accelerator Laboratory

FROM COLLISION TO DECISION: HOW WILL WE KNOW WHEN WE'VE FOUND THE TOP QUARK?

POW!

A proton, moving as fast as a proton can now be made to move on earth, smashes head-on into an antiproton moving just as fast the other way. Proton and antiproton smash to bits, pieces flying in all directions. The pieces are particles—perhaps a dozen different kinds produced in any one collision. One of the pieces might be the top quark. How do we know? Is it time to call the reporters with news of a discovery? Or is it just another day at the high-energy physics frontier?

A collision is over so fast we could never see it happen. However, most of the particles produced in a collision leave behind their electronic “signatures” in a particle detector’s guest book, as it were, before they check out. To learn what took place in a collision, physicists use computers to look at these

electronic signatures. From them, the physicists determine which of several hundred possible particles were present at the scene. Most of the guest list reveals the same old crowd, particles that turn up so often that the computers are taught to ignore them. Much less often, say one time in a million, an interesting signature turns up, and the computer takes note. It might be the mark of one of several intriguing particles. One time in a few billion, it might even be the handwriting of top.

Although we haven’t seen the top quark, we think we will recognize its signature. Some particles, including top, exist for such a short time before they decay into other particles that we don’t actually find their signatures. Instead, we see the signatures of their decay products. A particle we are looking for may have more than one possible way of decaying—top has a handful—and

Discovery of the top requires distinguishing a real top signature from those of other processes, called background, that can mimic a top signature.

thus more than one possible signature. The search gets complicated.

Fermilab’s Tevatron has enough energy—just enough, physicists believe—for top to appear very rarely, once in a few billion collisions. Discovery of the top requires distinguishing a real top signature from those of other processes, called background, that can mimic a top signature. To discover top requires showing conclusively that its signature appears statistically more often than we would expect to see it from the background alone. In other words, if we expect to see four top-like signatures from background in a certain number of collisions, we must see more than that many to be sure we’re seeing top. But how many more? Here comes the statistical part. When we say that we expect to see four events, it doesn’t mean that every single experiment would see exactly four. Sometimes we might see two, sometimes six. If we repeated the experiment many times the average would be four, but any particular experiment might see a fluctuation to a larger or a smaller number.

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TOP QUARK

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To be sure that we're seeing top, we require so many events above the expected background that the probability of mistaking it for a background fluctuation is very small. We also need to understand the backgrounds themselves. Physicists keep asking themselves, "Have I thought of all possible backgrounds?"

"Some physics discoveries stare you in the face—you almost can't miss them," says Fermilab experimenter Claudio Campagnari. "You see the signature event and you know you've got it. But top is probably not one of those, at the energy of the Tevatron. Rather than one 'Eureka!' event, top discovery will come by accumulating a lot of different evidence, bit by bit. You could compare discovering top with what hap-

pens in a courtroom in a case where there's no smoking gun and you must convince the jury by the accumulated weight of circumstantial evidence."

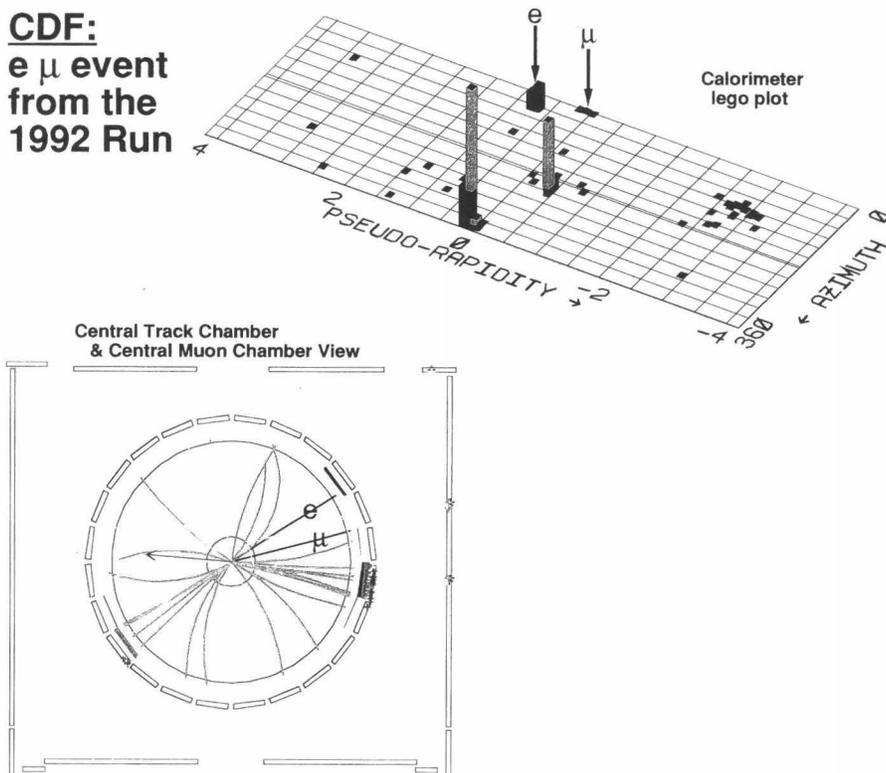
Physicists working on Fermilab experiments who find what might be evidence of the top quark must first persuade themselves that what they have found are real signals from top, not merely background events. Next they must convince that most skeptical of juries, their 400-plus collaborators, that the top signatures they have identified are the real thing. When the

weight of evidence becomes so great that the collaboration formally accepts it, only then can Fermilab make a definitive announcement of the discovery of the top quark. ■

Can you read this?

To read this paragraph, you must distinguish the type from the background on the page. Physicists searching for the top quark must distinguish the top signal from the electronic background. **The stronger the top signal, the easier it is to distinguish from background.**

CDF: e μ event from the 1992 Run



Physicists recognize particles produced in collisions by their electronic signatures, shown graphically by computers. Above, a "lego plot," at the top of the figure, shows one characteristic signature pattern we expect to see in the decay of a top quark. The height of each lego tower shows the amount of energy detected in each section of a detector's calorimeter. The circle on the left shows another computer-generated view of a possible top signature, with particle tracks emerging from the center of a collision.

NEW COMMITTEE TO STUDY EMPLOYEE DRIVING HABITS

Do you drive to work alone, sipping your coffee and enjoying your favorite radio station and your solitude, or do you ride into work with a co-worker, sharing gas expenses and catching up on the latest Lab news? A recently appointed committee at the Lab wants to know.

The Employee Commuting Options Team was recently formed by the Directorate to develop strategies and options to bring Fermilab into compliance with the clean air provisions of state and federal laws.

A new Illinois Employee Commute Options Act, designed to reduce carbon monoxide emissions, was recently enacted as a result of the 1990 amendments to the Federal Clean Air Act. The Clean Air Act requires states that are designated as severe ozone non-attainment areas, such as Illinois, to revise their pollution control plans to reduce commuter traffic. Illinois, through its new act, is requiring all employers with more than 100 employees to survey their workers to determine the average passenger occupancy of motor vehicles.

To determine the current commuting habits of Fermilab employees, the Commuting Options Team will be sending all Lab employees a survey in the near future. The survey results will assist management in designing and implementing a plan which will satisfy state requirements and be responsive to employee needs.

Team chairperson, JIM RICHARDSON (BSS), said the ground rules and formulas are somewhat complicated and the precise rules are still being developed by the Illinois Department of Transportation.

The Illinois Act, does stipulate, however, that in the event the employer's average passenger occupancy is less than 125% of the state's average vehicle occupancy, the employer must submit a compliance plan to the Illinois Department of Transportation describing how the employer is likely to achieve a ratio of 125% within two years of the employer's submission of its plan.

The Act will require certain employers, and possibly Fermilab, to implement programs to encourage alternative

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means of commuting, such as car pooling, van pooling, use of public transportation, telecommuting, flex time, staggered work hours, compressed work weeks and the use of clean fuel vehicles.

The Employee Commuting Options Team members are: STEVE GOURLAY, DEB GROBE, JENNIFER HANDLEY, ROGER HILLER, MARK LEININGER, JACK PFISTER, JANET PORTER, JIM RICHARDSON, DON ROHDE, DIANA SMAILUS, JAN WHITEAKER, JULIE WHITMORE, GREG WOJCIECHOWSKI and RUSS WOOD. ■

POWER OUTAGE STOPS OPERATIONS

A ground fault at the Master Substation caused a power outage site wide April 5. The power failure shut down the accelerator and forced employees to work a few hours without electricity. The outage occurred at 11:55 a.m. and power was restored to the site at 1:16 p.m. that afternoon.

DAVID NEVIN, deputy head of FESS, said the ground fault occurred in transformer 82B, the transformer that sends pulsed power to the Main Ring. "As the power was leaving the substation, there was a high voltage cable fault which ignited the duct filler foam. This fire caused the Master Substation to be

filled with smoke." As a protective measure, when there is a full failure like this, there is an automatic sequence inside the substation that shuts down all transformers. That is why the ground fault resulted in a sitewide outage.

Further damage within the Master Sub-
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DEVLIN & PONDROM RECEIVE PANOFSKY PRIZE

Fermilab experimenters THOMAS DEVLIN and LEE PONDROM have been awarded the 1994 W.K.H. Panofsky prize by the American Physical Society Division of Particles and Fields. The prize is awarded annually in recognition of outstanding achievements in experimental particle physics.

They were honored “for their elegant series of strange-baryon experiments at Fermilab. They discovered that, contrary to expectations, hyperons are produced polarized in hadron collisions. This allowed them to make precise measurements of the hyperon magnetic moments, thus providing important data for understanding the strong interaction in the static limit.”

Throughout the last 20 years, Tom and Lee have led a series of hyperon experiments at Fermilab. They initiated the neutral hyperon beam, which produced the discovery of high polarization of the beams. This in turn led to the precise measurement of the magnetic moments of most of the hyperons and a more

complete understanding of the quark structure of the baryons. Their measurements are thought to provide one of the best direct experimental evidence for the existence of constituent quarks.

Tom said the award is “recognition for the efforts of many people, the physicists in the E8 series of experiments and the many members of the Fermilab staff who helped us in so many ways. You all worked very hard to make our experiments run, but you contributed more than just that.”

Lee added, “I am very pleased that our work during the golden age of the Fermilab Fixed-Target program has been recognized. It was great fun. Although by modern standards the group was small, it was nevertheless a collaboration, and it depended on the efforts of many people for its success.”

Tom received his Ph.D. from the University of California, Berkeley in 1961. He worked at the Lab as an experimenter on the hyperon beam in 1980



Thomas Devlin



Lee Pondrom

to 1981. He returned to the Lab in 1988 where he served as leader of the CDF Data Acquisition Group until 1990. He is presently a professor of physics at Rutgers University.

Lee received his Ph.D. from the University of Chicago in 1958. He worked on baryon experiments at the Lab from 1974 to 1982. Since 1982 he has been working on the CDF experiment. He is presently Robert W. Wood Professor of physics at the University of Wisconsin, Madison.

Tom and Lee will receive their award at the APS April Meeting April 21 at the Hyatt Regency in Crystal City, Virginia. Burton Richter, president of APS, will present the award. At the ceremonial session Tom and Lee will also give talks. Tom will speak of their early work on hyperon experiments and Lee will speak on their later work. ■

WILSON PRIZE AWARDED TO COLLINS AND VOSS

The American Physical Society Division of Physics of Beams and the Division of Particles and Fields has named THOMAS COLLINS, formerly of Fermilab, and Gustav-Adolph Voss of DESY Laboratory in Hamburg the combined winners of the 1994 APS R.R. Wilson Prize. The prize recognizes and encourages outstanding achievement in the physics of particle accelerators.

The two were honored “for seminal

contributions to the principles of optical design that led to the development of high luminosity interaction regions for colliding-beam storage rings.

“At the Cambridge Electron Accelerator (CEA), shortly after the invention of the alternating gradient principal, Thomas Collins had the insight to suggest a simple way of introducing straight sections into otherwise periodic lattices. This important step was followed



Thomas Collins



Gustav-Adolph Voss

by the invention of the high-luminosity low-beta scheme by Gustav-Adolph Voss, working with K. Robinson, both also of CEA. These combined efforts have led to the development of the high luminosity interaction regions of modern colliding-beam storage rings.”

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People Events

KNAUF GOES FISHING

G E R R Y KNAUF, an employee with TS/Machine Shop since November of 1973, retired from the Laboratory March 31. Gerry had been an instrument maker in the Machine Shop.



His plans for life after the Lab are simple, he said: "Fish and travel, travel and fish."

Gerry said that his many years at the Lab were gratifying. "I enjoyed all my years at the Lab and all the people I've worked with."

UNDERWOOD HITS THE ROAD

After 13 years of working in the Technical Support Section, G E N E UNDERWOOD has retired and is now getting ready to jump in his mobile home and "hit the road." Gene joined the Lab in January 1981. He retired from his du-



ties as a shop administrative assistant at Industrial Building 2 on March 31.

Besides spending time traveling in his motor home, Gene said, "I plan to enjoy life and do the odds and ends I haven't had time to do."

Gene said he felt the Lab was good to him. "I enjoyed working at Fermilab and I enjoyed the people. I'll miss being there. But there is a time for everything and this is the time."

WEGFORTH TAKES OFF

D I C K WEGFORTH, a long-time designer with TS/Eng, retired from the Lab March 31. Dick joined Fermilab in February 1976 and worked as a contractor at the Lab for six months



prior to joining the staff.

Now that he has this new-found time on his hands, Dick said he plans to sell his house, hook up his 31-foot trailer and "travel around."

Dick added he'll miss the diversity of his job. "I met many people in different groups. That is one of things I'll miss. I enjoyed the people and the challenges."

ARTS SERIES PRESENTS

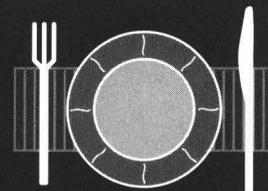
SNEAK PREVIEW - SUMMER 94
Summer 94 is bursting with great music at Fermilab. Tickets are available only as a series until June 1 at which time single show tickets will be available for purchase. The Summer Series ticket price is \$33, a savings of more than 10% over single ticket purchase, and since single show tickets will not go on sale until June 1, series tickets ensure the best seats in the house. Call the box office at x2787 (ARTS) to reserve your tickets today!

Koko Taylor & Her Blues Machine, Saturday, June 25, 1994
Koko Taylor, The Queen of the Blues. She earned the title in the tough, male-

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Chez Leon Menu

Lunch (Wed) \$13.00 • Dinner (Thurs) \$23.50
Reservations: x4512



Wednesday, April 20 • Spring salad w/pink grapefruit & avocados, fillet of sole w/crab meat, green vegetable medley, profiteroles w/fruit

Thursday, April 21 • Booked

Wednesday, April 27 • Herring platter, Danish open sandwiches, cucumber & dill, apple almond cake

Thursday, April 28 • Asparagus w/maltese sauce, grilled brochette of fish, lemon parsleyed rice, vegetable of the season, linzer torte

USERS' CENTER MOVIES

Tired of spending \$7 for a movie? Well, save your money and come to the Users' Center on Saturday nights to see your favorite movie on video. Movies are shown each Saturday night at 7:30 p.m. and 9:30 p.m. The Users' Center is open on Saturdays from 7 p.m. until 12 a.m.

■ April 16: 7:30 p.m.: *Much Ado About Nothing*, 9:30 p.m.: *Hard Target*

■ April 23: 7:30 p.m.: *For Love or Money*, 9:30 p.m.: *Kalifornia*

■ April 30: 7:30 p.m.: *Robin Hood: Men in Tights*, 9:30 p.m.: *Striking Distance*

ARTS SERIES

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dominated blues world, taking her gritty music from tiny Chicago clubs to giant festivals, network radio and television performances. She's received every honor the blues has to offer, including the Grammy for Best Blues Recording in 1984. Seven of her last eight albums have received Grammy nominations. The blues community's highest honor, the W.C. Handy Award, has gone to Koko 10 times—more than any other artist. In 1964, she recorded "Wang Dang Doodle," which soon became a million-selling hit, starting her reign as "The Queen of the Blues."

Christine Lavin & John Forster,
Saturday, July 16, 1994

"Folk singing," says Christine Lavin, "is more of a neighborhood than a business." Lavin, one of the friendliest and funniest neighbors on the block, is

Congratulations!

To Mary Fazekas and JIM SHULTZ (LS/Audio Visual) on the birth of their son Mark Ethan Fazekas Shultz. He was born on March 11, 1994 at 10:09 p.m. at Good Samaritan Hospital in Downers Grove. He weighed seven pounds, seven ounces and was 20 inches long. He is welcomed by brothers, Matt, 5 and Michael, 2.

To LAURI L. LOEBEL (CD) and DON C. CARPENTER (RD) on their recent nuptials. The two were married April 2, 1994 in Pewaukee, Wisconsin.

BUMP, SET, SPIKE!

Don't miss this chance for fun, exercise and enjoying sand between your toes—join the Summer Volleyball League. Games will be played on Mondays and Tuesdays beginning May 16. The captains meeting is May 10 at 12 noon at

the newly renovated volleyball courts. For more information or to sign up, contact Jean at x2548 or FNALV::JEANM or Maxine at FNALV::MAXINE.

introducing the new kid on the block. Her sell-out appearance at Fermilab last May introduced *The Four Bitchin' Babes* to the Fox Valley. This year she brings John Forster, touted as the "new Tom Lehrer," to delight us. Their plaintive duo "Way Down Deep We're Shallow" has repeatedly swept the top spot on the Doctor Demento charts.

Lavin, a New York native has been playing her often amusing and sometimes poignant songs since the early 70s. She now has six solo albums. John Forster's impressive debut album *Entering Marion* lampoons everything from the reunification of Germany to fast food with wit and musical style.

Altan,
Saturday, August 27, 1994

Since the group's debut in 1987 critics throughout Europe and America have been raving about Altan. Their five albums to date have collectively re-



Koko Taylor

ceived such honors as Top Folk Album of 1990 by *The Irish Voice*, *The London Telegraph* and "Q" Magazine (Britain's equivalent to *Rolling Stone*); 12 weeks in the Top Ten in Billboard's World Music Chart and top 10 ranking by Folk Roots. Altan features the angelic voice of Mairead Ni Mhaonaigh singing songs in her native Gaelic and in English. The group is rounded out by Ciaran Tourish, fiddle; Frankie Kennedy, flute; Dermot Byrne, accordion; and Ciaran Curran, bouzouki and Daithi Sproule on guitar.

MOVIES

The Fermilab International Film Society presents movies from all over the world. Movies are shown at 8 p.m. Fridays in Ramsey Auditorium. Admission is \$3 for adults, \$.50 for children under 12.

■ April 15: *200 Motels*

Always ahead of his time, Frank Zappa predated the rock video in what can best be described a visual equivalent of any of his 60s or 70s recordings. Frank Zappa and Tony Palmer, dirs., Great Britain, 1971 (98 minutes).

■ April 22: *Diva*

An opera-intoxicated 18-year-old mail carrier becomes unwittingly entangled in a web of murder, intrigue and passion. Jean-Jacques Beiniex, dir., France, 1982 (123 minutes).

STOCKROOMS TO CLOSE

The Fermilab Stockrooms will be closed for annual inventory on the following schedule:

■ Wilson Hall Stockroom:

Closed Friday, May 13 at 12 noon. Re-open Monday, May 16 at 12:30 p.m.

■ Site 38 Stockroom:

Closed Monday, May 16 and Tuesday, May 17 all day, both days.

Harper's Index

Rank of cola, breakfast cereal and ground beef, among the groceries Americans spend the most on each year: **1, 2, 3**

Number of poems included in *The Best American Poetry 1993* that rhyme: **1**

GET INTO THE SWIM

Fermilab swimming pool memberships go on sale May 2 in the Recreation Office, WH15W. Pool membership is open to Fermilab employees, visiting researchers, eligible contract personnel and their immediate families. Applications are available in the Recreation Office or by calling x4512 or x2548. Season rates are: Single, \$25; Couple, \$40; Family of four, \$60. Each additional family member is \$5. Children

under age 2 do not require a pool tag. Daily and guest fees are \$3 per day. Guests must be accompanied by a Fermilab employee. The pool will open Memorial Day weekend, May 28 at 9 a.m. Pool hours are weekdays from 12 to 8 p.m. for family swimming and 11:30 a.m. to 12 noon for adult lap swimming; weekends and holidays from 9 a.m. to 8 p.m. for family swimming. The pool closes at 8 p.m.

CHILDREN'S SWIMMING LESSONS OFFERED

Applications for children's swimming lessons will be available May 2 in the Recreation Office, WH15W or by calling x4512 or x2548. Classes are first come, first served. Lessons will be held on Mondays, Wednesdays and Fridays. Beginners' classes are from 11 a.m. until

11:45 a.m. and intermediate classes are held from 10 a.m. until 10:45 a.m. Children in the beginners' class must be at least 42" tall or five years of age. Session dates are: Session I: June 13 - July 15; Session II: July 18 - August 19. The cost is \$20 per child/per session.

HOW DO I JOIN THE GYM?

The answer to this and other recreation-related questions can be found in the new Recreation Office Information booklet recently distributed to all mail stations. This booklet contains information regarding all recreation facilities, activities, programs, leagues and clubs available at the Lab. Please keep

the booklet handy for future reference. Individual mailings of information on the recreation facility, swimming pool, day camp and swim lessons will not be done in the future. For additional copies of the booklet, contact the Recreation Office at x4512 or x2548 or J. Guyer at FNALV::JEANM or quickmail.

MICROWAVE CHECKS BEGIN

The ES&H Section annually surveys microwave ovens at Fermilab for sanitary condition and microwave leakage. This year's survey, conducted by co-op

students, has begun. If you have a new microwave oven or one that was not surveyed last year, please call x2977.

WOMEN & HEART DISEASE: STARTLING STATISTICS

The statistics are startling: 43,000 women die each year due to breast cancer, 90,000 die due to diabetes and 500,000 die each year due to heart disease. Dr. Deborah Doud, a cardiologist at Edward Hospital in Naperville, discussed these statistics with Fermilab employees March 22 at a Wellness Works Committee noon-time seminar on women and heart disease.

Doud explained that it is important for women to be aware that they are at risk for heart disease. In 1968, women were at a low risk, today the chances of developing heart disease is almost equal to that of men, Doud said. "More than 10 million women have heart disease. One in nine women between the ages of 45 and 65 has cardiovascular disease and after the age of 65, it jumps to one in three."

Doud said that there are, however, differences in the way women develop the disease in comparison to men. Women are more likely to develop the

disease 10 to 15 years later than men normally do. Risk factors, such as diabetes, in particular, also contribute more to increasing women's chances of developing heart disease than they do in men. In addition, Doud said, women are different in presenting symptoms. "Women don't come in to (the hospital) complaining of a heart attack, they come in with 'just chest pain.'" They often underestimate the seriousness of their condition. Also, when a woman has a heart attack, her prognosis is often worse than a man's and her mortality rate is twice that of her male counterpart.

So why this difference? "It's the hormones," said Doud. To lower the risk of developing heart disease, many women take estrogen. "Estrogen affects the level of cholesterol. It helps produce HDL, the good cholesterol, and get rid of LDL, the bad cholesterol." Estrogen use, however, is controversial, said Doud, because with its use there is an increased risk of devel-

"More than 10 million women have heart disease. One in nine women between the ages of 45 and 65 has cardiovascular disease and after the age of 65, it jumps to one in three."

—Deborah Doud, M.D.

oping uterine cancer and, possibly, breast cancer, depending on a woman's family medical history. Doud said that if the estrogen is taken with progesterone, the risk of developing these cancers decreases. "But progesterone does everything opposite to cholesterol that estrogen does," cautioned Doud. With any treatment, however, it is important to consult your physician, she added.

Following simple preventive techniques, such as eating a well-balanced diet, exercising and reducing stress, can significantly reduce the risk of developing heart disease, said Doud.

In Case of Emergency. . .

The ES&H Section would like to remind all employees of the proper response to an emergency. An emergency is, after all, a rare occurrence and it is easy to forget the proper procedures to follow in such a situation.

In case of an emergency situation (e.g., serious injury or illness) at the Laboratory dial x3131, give your name, location and the nature of the emergency. Stay on the phone until the emer-

gency operator indicates he or she has all the necessary information. It is not always easy to tell the extent of an injury or illness. Therefore, please err on the side of caution. That is, if there is any doubt, call x3131.

NOTE: All CPR-trained employees should follow prescribed precautions and use protective mouthpieces if they choose to administer this form of aid in an emergency situation.

WILSON PRIZE

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Collins received his Ph.D. from the University of British Columbia in 1950. He was a member of the design team of the CEA and later joined the staff at Fermilab, where he retired a few years ago.

Voss received his Ph.D. from the Technische Universitaet in Berlin. He is currently vice chairman of the directorate at DESY.

The Prize will be presented April 20 at the APS Spring Meeting in Washington, D.C. ■

FESS OFFERS CLASSES FOR CERTIFICATION

After November 11, 1994, EPA certification to work on refrigeration systems will be mandatory. A test to become certified will be given this summer to all personnel who are involved in the servicing and recovering of refrigerants in these systems. A course

presented by a certified instructor will be offered prior to certification testing. If you are interested in obtaining an application and attending the course, or would like more information, call DENIS BOWRON of the FESS/Operations & Maintenance Group at x4664.

NALREC INFORMATION

Nalrec is selling Great America tickets at a discounted price. Adult tickets are \$22 and children's tickets (for 4 to 12 year olds) are \$12 until June 24. After that time, the children's ticket price increases to \$22.

Adult, Sun.-Thurs., \$24.95; Friday, \$30.95; Saturday, \$35.95. Tickets for children under 12 are \$17.95 for any day. Price includes two-hour dinner and tournament, four course Medieval feast, two beverages and tax.

Nalrec is also selling Medieval Times Dinner & Tournament tickets at concession prices. Ticket prices are:

Tickets for both attractions are available from Denise at the Wilson Hall Atrium front desk.

POWER OUTAGE

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station was caused when the metal bus enclosure that houses the power line also blew out. This delayed FESS personnel from restoring power quickly, added David.

According to BOB MAU (AD/Accel. Oper.) the outage caused the Main Ring and the Tevatron to be down for nearly 30 hours. The Linac and Booster, however, recovered and were operational within a few hours after the incident.

"We lost the liquid helium and both the Tevatron store and the pbar stack," said Bob. "There is a rule of thumb that if the accelerator is down for 15 minutes, we can recover the cryogenics within a day. Over 30 minutes and we will have to make up for what was lost.

We lost a couple of days."

Bob said, however, the Accelerator Division did use this time to their advantage, and conducted maintenance work and a test on all interlock doors leading to the Main Ring and Tevatron. This test was scheduled to be done in the near future during a scheduled shutdown. By April 8, Bob said, all systems were up and running.

To clear up some confusion about the incident, David added, the outage was not caused by a goose that flew into a power line in the Village. In this unrelated incident, a goose apparently flew into a line in the Village about 11:30 a.m. that morning, knocking out power to parts of the Village. It did not lead to the sitewide power outage. ■

NALWO NEWS

NALWO invites you to a talk on the history of Fermilab on Wednesday, April 20 from 10 a.m. until noon at the Users' Center. ADRIENNE KOLB, Fermilab's archivist, will present interesting and entertaining information highlighting the development of the site during the past 15 years. Questions and discussion are welcome. Call BRENDA KIRK at x3440 for information.

DOE EXPANDED CORE VALUE #8

We pursue the highest standards of ethical behavior

- We maintain a personal commitment to professionalism and integrity.
- We assure conformance with applicable laws, regulations and responsible business practices.
- We keep our commitments.
- We are objective and fair.

This is the last in a series of published core values.

In Memoriam

JOHN (JACK) F. LINDBERG, a former Fermilab employee, passed away March 26, 1994. Jack retired from Fermilab on March 15, 1990. He worked as an engineer in the Research Division after joining the Lab in July 1969.

LIBRARY NEWS

NCSA MOSAIC HOTLIST ADDRESSES

Here are some of the Library's favorite URLs you can try on you Mosaic browser: (Once you put them in your HotList, you can forget the long addresses).

World Wide Web SLAC Home Page for access to SPIRES, etc.: <http://slacvm.slac.stanford.edu/FIND/slac.html>

High-Energy Physics Information for a list of sources: <http://info.cern.ch/hypertext/DataSources/bySubject/Physics/HEP.html>

WWW Library: Engineering sources: <http://epims1.gsfc.nasa.gov/engineering/engineering.html>

WWW Library: Electrical Engineering sources: <http://epims1.gsfc.nasa.gov/engineering/ee.html>

WWW Library: Astronomy & Astrophysics sources: <http://info.cern.ch/hypertext/DataSources/bySubject/astro/Overview.html>

Virtual Reference Desk for online access to the Periodic Table, U.S. Budget, Foreign Currency Exchange Rates, Zip Code Directory, Disability Infor-

CLASSIFIEDS

■ VEHICLES

1989 Voyager van, black cherry color, 8 pass., 2.5 liter engine, A/C, power brakes/steering, 84k miles, runs great, \$7,000 o.b.o. Call x3585 or page 0329 or 708-553-0128.

■ MISCELLANEOUS

New (never used) set 1/3/5 Pro-Motion metal woods w/stiff steel shafts, \$100/set. Call Dwight at x2233.

Tappan 30" free-standing electric stove, self-cleaning, almond color, like new/used for 1 year, \$375, will deliver locally. Call Jean at x2548 or after 5:30 at 708-897-9343.

■ REAL ESTATE

Townhouse, former model, end unit

by Fox Valley Mall, finished basement, 3 bdrm, 1.5 bath, all equipped. Open house April 16, 12-4 p.m., \$94,900. Call 708-898-5267.

■ SPECIAL NOTICE

An Aurora family is adopting three Russian orphans in the middle of April. These children are ages 4, 5 and 7. They will attend Hall School, but have no English or formal education so far. If you speak Russian and English and could provide some help in translating or tutoring on a voluntary basis, please contact Selcuk Cihangir at x2636 or his wife, Diane at 708-859-2281. Thank you for your assistance. These children could benefit from your help.

mation, Clinton's Speeches, Schedules, Statements...and much more: [gopher://peg.cwis.uci.edu:7000/11/gopher.welcome/peg/VIRTUAL%20REFERENCE%20DESK](http://peg.cwis.uci.edu:7000/11/gopher.welcome/peg/VIRTUAL%20REFERENCE%20DESK)

GNN Home Page for access to the Global Network Navigator: <http://nearnet.gnn.com/GNN-ORA.html>

NEW STOCK ITEMS

■ 2250-1950

Gloves, insulated, fully coated plastic, knit wrist, fluorescent orange, Edmont P/N23-471.

FermiNews

*The Newsletter of the
Fermi National Accelerator Laboratory*



FermiNews is published by the Fermilab Publications Office
MS 107, PO Box 500 Batavia, IL 60510 • 708-840-3278 • FNAL::TECHPUBS

Fermilab is operated by Universities Research Association, Inc.
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The deadline for the Friday, May 6, 1994 issue is WED., APRIL 27. Please send your article submissions or ideas to the Publications Office.