

# FermineWS

FERMI NATIONAL ACCELERATOR LABORATORY

## Record setting 1992-93 collider run ends

The first collider run with both CDF and DØ collaborations taking data has ended after great operational success.

The accelerator has operated above all the major goals set prior to this run, and the detectors have collected an immense amount of data. The Tevatron has achieved a higher luminosity during the early months of 1993 than ever before. Higher luminosities increase the probability of meaningful particle collisions. Integrated luminosity (considered the best measure of accelerator performance) for the entire run was nearly 32 inverse picobarns ( $\text{pb}^{-1}$ ), 20% better than the goal set for this collider run.

The detector collaborations have both expressed satisfaction and excitement over the quality and amount of events that they have recorded during the last run. DØ, against many odds, was able to begin taking good physics data much earlier than many had thought possible. Out of millions of events, they have recorded approximately 15,000 W bosons and 1,500 Z bosons. CDF has been very successful after its numerous upgrades, with about 80% operational efficiency and more than 17 million events recorded to tape.

For the physicists working to interpret and understand this data, the run has been the culmination of a great deal of preparation and anticipation. Now it is time to begin to process everything collected in the past year, plan for the future and publish results. Among the most anticipated results will be the answer to the question, "top quark, or no top quark?"

For the Accelerator Division and other technical support personnel, the end of the run means it's time to begin performance analysis, repairs and upgrades of the accelerators and their support hardware. The summer will be an active one, with the installation of the 400-MeV Linac, the addition of a new cold compressor system to the Tevatron and a serious effort to address and solve some of the problems that have hampered the performance of the Main Ring.

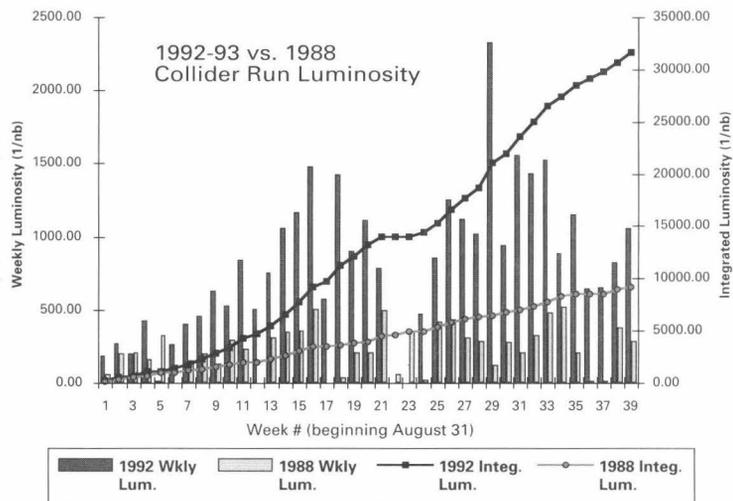
The just-ended run began last May 12, 1992 with accelerator start-up and ended at midnight, this June 1. In mid to late September, after the numerous upgrades and maintenance projects are completed, the Booster and the Main Ring will be powered up to test their stability with the Linac's new 400-MeV injection energy. Sometime after this the Tevatron will be cooled down to operating temperature. If things go as planned, the colliding beam experiments are scheduled to begin receiving beam again in the fall.

## Fermilab collider detectors "just do it"

There's no doubt about it.

CDF and DØ are the Michael Jordan and Charles Barkley of the high-energy physics game. And, just as the NBA stars claim to be, these two physics collaborations are engaged in friendly competition. The difference comes in the prizes—top quark instead of championship ring.

Both collaborations have had successful and exciting 1992-93 runs. With the Tevatron giving record performance over the last continued on page 6



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## "Ups & downs" for accelerator

The Fermilab accelerators have put their operators through a gambit of possible problems and successes during the last collider run. From loss of beam stability to several hardware problems to record luminosities, the 1992-93 run has been a unique experience for those working in or around accelerator operations.

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# Out with the old, in with the new...Linac, that is

After 23 years of nearly 100% reliable service, four of the nine original Linac drift tube tanks have been removed from the Linac Gallery.

And, for the next 12 weeks, a team of physicists, engineers and technicians will be working conscientiously to replace these 60 meters of venerable hardware with the bulk of the Linac Upgrade Project.

The benefits of this new system will include a doubling of the final beam energy out of the Linac from 200 MeV to 400 MeV and therefore a 75% increase in the number of particles sent down to the Booster. This should produce a higher luminosity in the Tevatron, and is the first phase of the accelerator upgrades that will eventually culminate in the commissioning of the Main Injector.

Even back in the late 1960s, there were better known ways to accelerate protons, once they had reached energies of 100 MeV or so, than the drift tubes of the Linac. The original decision to use the same system up to 200 MeV was one of simplification—it was easier to make one consistent accelerator than to add another piece to an already complex

puzzle. With the desire to double the Linac injection energy, however, it was decided that the time had come for a new system.

In place of the last four Linac drift tubes will be seven modules of newly produced side-coupled cavity accelerators. Each of these six- to 10-meter long modules are made up of four sections, and each section is in turn a collection of 16 individual “cells.” The main advantage of the new Linac sections comes from the large number of these small,

dent cells. With all 448 cells acting in unison, the new modules of the Linac will accelerate particles at about three times the rate of the original drift tubes.

The original Linac has gone through some substantial changes in the past 23 years, but none as extensive as what will take place this summer. **Bob Noble** (AD), project manager for the upgrade, explained that there have been several changes in the support hardware for the Linac, but that this is the first time since it was commissioned in 1970 that any substantial beamline hardware has been replaced. “The Linac went through some

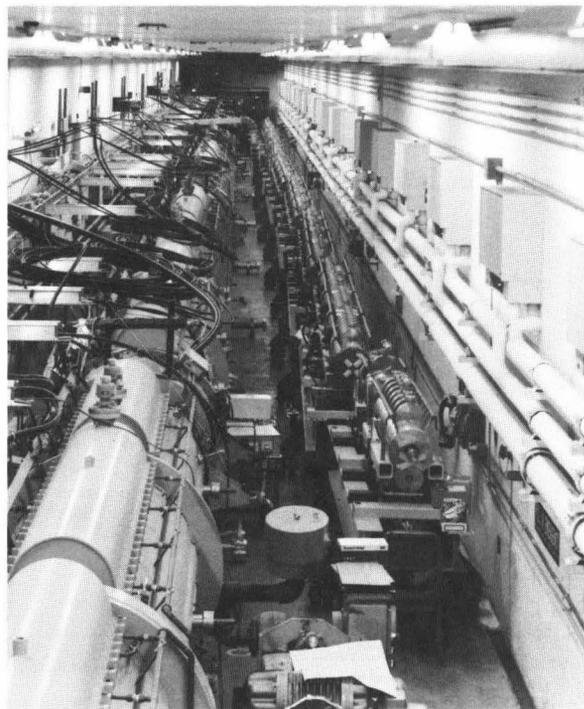
The NTF was the largest single contributor of patient histories to the studies that eventually led to neutron therapy becoming a routine therapy for certain types of cancer.

The NTF should be largely unaffected by the Linac upgrade, in that the treatment beam is taken out of the accelerator “upstream” from the new modules. While the upgrade installation is taking place this summer, patient therapy will be scheduled for the evenings, after the accelerator area has been cleared and sealed off.

The actual installation of the upgrade should be finished by the end of August or the



*A view of the Linac Gallery as the first drift tube tank is moved in 23 years ago. The last four tanks were removed this past week.*



*The new 400-MeV Linac will utilize side-coupled cavity accelerator modules (r), seen here ready to be moved into the existing drift tubes' positions.*

changes when we switched from using protons to negative hydrogen ions,” Bob said, “and the control hardware was replaced in the mid-70s and again just recently to support the 400-MeV upgrade.”

Another substantial change came in 1975 when the Neutron Therapy Facility was constructed. The Linac serves as the source accelerator for this unique treatment facility. Space was created between two of the drift tube tanks to allow beam to be magnetically bent and rerouted towards the treatment room.

beginning of September. After this, the commissioning process will take place. Bob said this could take from one to four weeks, depending upon how well all the variables fall together.

And the old Linac? Most support hardware, such as power sources and electronics, will be shelved for use as backup systems for the five remaining drift tube tanks. The tanks themselves will be sealed and moved to the Fermilab “boneyard” for proper disposal.

# Accelerator Division appoints department heads

Accelerator Division Head **Steve Holmes** has made two recent appointments to fill the Accelerator Physics Department and Main Accelerator Department head positions.



*Patrick Colestock*



*John Marriner*

**Patrick Colestock** has been asked to head the Accelerator Physics Department, while **John Marriner** takes Pat's previous position as head of the Main Accelerator Department. **Steve Peggs** left Accelerator Physics last year and the department has been headed by **Francois Ostiguy** in the interim. "I would like to express my deep appreciation for the fine job Francois has done...during this period," Steve Holmes said.

Pat has been at Fermilab since 1990. He

received his MSEE and Ph.D. from the University of Michigan. In 1976 he joined Rensselaer Polytechnic Institute on location at Oak Ridge National Laboratory where he developed ion beam-based plasma diagnostics for the Bumpy Torus experiment. In 1977 he joined the Princeton Plasma Physics Laboratory where he worked on experiments on the PLT and TFTR tokamaks, and participated in the design of the INTOR tokamak.

The Accelerator Physics Department head is responsible for managing and facilitating the theoretical and practical physics performance of the accelerator cascade. Pat's goals for the Accelerator Physics Department include continued analytical and theo-

retical support of the accelerator's operation. He wants to focus on follow-up of current accelerator operation problems for the detector collaborations, but also to continue to develop new projects and upgrades.

John came to Fermilab in 1974 as a graduate student. His thesis neutrino experiment was conducted in the 15 ft bubble chamber. John later joined the Lab Physics Department and worked on a Proton Center hyperon experiment. After moving to the Accelerator Division, he was involved in the TeV I project and commissioning of the Antiproton Source.

John explained that the Main Accelerator Department has overall responsibility for the Main Ring and the Tevatron systems. Working with the support groups and the Operations Group, the department ensures that the main accelerators are functioning at the highest possible level of performance.

## Ups & downs continued

Early in the run last year, the Main Ring and Tevatron both experienced stability problems related to the higher intensities being achieved. The Main Ring coalescing time (the time taken to "bunch up" the protons into tight groups) had to be shortened in order to bunch the protons before instability could occur. The Main Ring also experienced an instability (oscillation) problem likely caused by rf cavities. By measuring the oscillations and their effect on the beam, the offending rf cavities were identified and adjusted.

In November of last year, just as the initial problems with the accelerators had largely abated and the detector collaborations were beginning to accumulate solid data, another problem came to the forefront. An attempt to change the lattice (the magnetic-optical characteristics of the accelerator system) to a configuration that gave a smaller beam spot size at the interaction points for CDF and DØ met with difficulty. By making the beam spot smaller, higher luminosities can be achieved. It was hoped that this lattice change could significantly increase the Tevatron's performance.

The problem, according to new Accelerator Physics Department Head **Patrick Colestock**, was an error in the characteristics of the low-beta quadrupoles (those magnets near the interaction region). This error meant that the physicists had been making incorrect assumptions about the lattice.

"Several months during the winter were spent building new power supplies that allowed us to make small corrections to the low-beta quadrupoles," Pat said. Small corrections meant adjustments of only about one tenth of a percent, but this change was enough to allow the accelerator physicists to successfully complete the lattice change they had tried earlier in the run.

This wasn't the whole story, however. The expected improvement in luminosity was not achieved. This was because, believe it or not, the original inaccurate lattice configuration had been doing better than it was designed to do all along. As a result, a goal of 50% reduction in beam spot size actually became only about a 10% improvement over the conditions from the fall.

Despite all these problems, the Tevatron

achieved a record luminosity in May of approximately  $9.2 \times 10^{30} \text{ cm}^{-2} \text{ sec}^{-1}$ , a significant increase. It also saw short periods of dramatically increased proton intensity. All this, together with the upgrades being implemented this summer indicate that the next run, beginning this fall, could show even greater performance.

One of the major concerns in this increased performance is the conceded "weak link" of the accelerator system—the Main Ring. Substantial effort this summer is being put into identifying and solving some of the problems that limit and may disrupt the Main Ring's operation under higher intensity beams.

Pat sees difficulties, especially with the Main Ring, but he is also hopeful. "We know we can handle the high intensities in the Tevatron," he said. With the expected improvements to come over the summer, and with the experience that the Accelerator Division has gained during the last run, the goal now will be to continue to produce and handle the highest energy beams in the world.

## Summer tours offer look at Lab

The Public Information Office invites Fermilab employees to get to know their place of work a little better by taking a Summer Sunday Tour of the Laboratory. The tours will feature a look at the workings of the world's highest-energy accelerator.

For the past 15 months, the Fermilab Tevatron has been producing proton-antiproton collisions around the clock in its search for the top quark, the last missing piece of elementary matter in the Standard Model. A maintenance period scheduled for this summer will allow employees, their families and relatives to explore three of the Tevatron's feeder accelerator areas—the Cockcroft-Walton, Linac and Booster—and the Antiproton Source, a subterranean storage ring

for antimatter.

Summer Sunday Tours will begin in Wilson Hall. Following a welcome and brief orientation, guests will meet with Fermilab scientists and tour the first three stages of acceleration, the Main Control Room and the Antiproton Source. Visitors are advised that considerable walking and stairs are involved in the tours.

Summer Sunday Tours are scheduled for June 20, July 18, August 15 and September 20 from 2 p.m. to 4 p.m. each day. Reservations are required and can be made by calling the Public Information Office at x3351 weekdays between 8:30 a.m. and 5 p.m. The tours are free, but seating is limited so reserve your seats today!

## Nalrec news

The annual Hard Times Party will be held on June 25, from 5:15 p.m. to 9:15 p.m. at the Village Barn. This is a party you won't want to miss. Hard times are coming, so we're celebrating now with a five piece jazz band (great group) and serving Chicago style hot dogs and chips. Should be a great evening.

Fermilab-Kane County Cougar Day will be July 11 at 2 p.m. It should be a fun day at the old ball park. The first 1,000 fans will receive a special gift. Tickets are going fast. Tickets cost \$4 and are available from Denise Bumbar at the front desk, x2787, Charlotte Smith (WH5E), x8640 or George Davidson (Vehicle Maintenance Site 38), x3307. This game is with the Peoria Cubs.

—Charlotte Smith

## EAP brown bag

The Employee Assistance Program will be holding a brown bag seminar titled "He said, She said: Communications Styles of Men and Women," Monday, July 12 from noon to 1 p.m. in Curia II.

The seminar will be led by Virginia Schleyer, a local therapist in private practice in Naperville and Oswego. Don't miss this opportunity to learn why the opposite sex says the things they do.

## Nalwo activities

The next Nalwo potluck is today, June 18 at the Village Barn. Please bring a dish to share and perhaps some meat to grill. If you cannot bring a dish, please contribute \$3 at the door. Visitors and families are welcome!

The Fermilab International Folk Dance group sponsored by Nalwo will meet all summer long in cool comfort! Here is the schedule: Thursdays, 7:30 to 10 p.m. during June in the Village Barn, and during July and August in the Wilson Hall Auditorium, lower floor of the high-rise. Hope to see you there.

—Sue Mendelsohn

## E-Message service

The Communications Center, WH1NE provides electronic message services (facsimile, telex, twx, cablegram, etc.) 24 hours a day. Messages to be sent can be delivered to the Communications Center where the sender is provided with appropriate cover sheets to fill out. The addressee is notified of incoming messages which can be picked up at the Communications Center. Messages not picked up are placed in the inter-office mail the next working day.

Fermilab's facsimile number is 708-840-4343 and the verification number is 708-840-3000. For questions on electronic message services at Fermilab call x4251.

—B. Flaherty & R. Dorner

## Movie schedule announced

The Fermilab International Film Society presents movies from all over the world. Movies are shown at 8 p.m. Fridays in Ramsey Auditorium. All foreign films have English subtitles. Admission is \$3 for adults, \$.50 for children 12 and under. Coffee and cookies will be served on the second floor crossover following each film.

July 9: *Pale Rider*, Clint Eastwood directs and stars in this western as a nameless drifter known only as "Preacher" who steps into a fight between prospectors and an evil mining company, U.S., 1985, 115 minutes.

July 23: *Ramblin' Rose*, A 13-year-old boy in a well-to-do Southern family during the Depression falls in love with a charmingly promiscuous housemaid (Laura Dern). Martha Coolidge, director, U.S., 1991, 112 minutes.

## Fermilab Family Day

*Taste of Fermi! Fun! Lab facts! Food!*

A walk through the Antiproton Source and a Moon Walk are just two of the choices available to Fermilab employees and their families on Friday, August 6. The divisions and sections are planning to open their doors from 4 to 7 p.m. so you can catch a glimpse of some areas and activities not normally accessible during regular work hours. Your fellow employees will be explaining and demonstrating their particular piece of what makes Fermilab function.

Here's a chance for a guided visit — to the computer farms of Feynman or the Buffalo Farm on Batavia Road. Here's a chance to broaden your overall understanding of what Fermilab is all about.

In addition to touring, food and festivities will be happening in the Village from 5-9 p.m. Enjoy a ride on the Ferris wheel or treat the kids to a pony ride. Watch one of the famed *Weird Science* shows.

The folks from Nalrec are planning a varied menu of taste tempters and crowd pleasers. Join the fun!

## R/C Club begins summer flying

The Fermilab Barnstormers Radio Control Model Club will host the 4th annual Anthony Freló Memorial Helicopter Fly-In June 26 and 27. Everyone is invited.

This is the first official Barnstormers summer event that includes two days of model helicopter flying fun. Pilots of all skill levels are encouraged to participate, with everything from trainers to scale models. Factory representatives will be on hand for demonstrations and advice on all aspects of the hobby.

Guaranteed fun for all! Pilots must have

Association of Model Aeronautics license. Spectators are welcome and refreshments will be available.

Scheduled 1993 events include:

Fermilab Family Day Demonstrations - **August 6**; Anthony Freló Memorial Biplane Contest - **August 28 & 29**; Anthony Freló Memorial 1/4 Scale Fun Fly - **September 12**; Control Line Contest - **October 3**.

Flying will be from 9 a.m. to 4 p.m. each day. For more information call Jay Hoffman, president x4156 or Jim Zagel, secretary x4076.

## Universal life insurance

Fermilab again has made arrangements with Corporate Benefit Systems, Inc. (CBS) to offer the supplemental universal life insurance program for you and your family. This program is voluntary and available to all active employees who have completed at least six months of service with the Lab. A letter and brochure describing the program will be mailed to the mail stations of employees hired between May 16, 1991 and December 31, 1992. All other employees hired before May 16, 1991 were given the opportunity to join the plan in prior years. However, if you wish to meet with the CBS representatives to ask questions or join the program, they would be happy to do so. Please contact the Benefits Office at x3395, 4362 or 4361 to schedule an appointment for Tuesday, June 29, 1993, the date the representatives will be here.

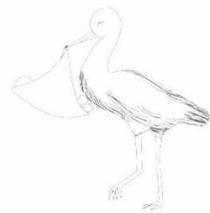
If you are not going to be at the Lab on Tuesday, June 29, and wish to meet with a representative, other arrangements can be made. Call the Benefits Office for information.

—Paula Cashin

## Congratulations to

Cleo and **Martha Garcia** (FES/E&P) on the birth of their son Richard. Richard was born on June 8, 1993 at 5:29 a.m. at Mercy Center in Aurora. He weighed seven pounds, 12 ounces and was 20 inches long. Richard is welcomed by brother Gerry.

Marise and **Sergio Zimmermann** (RD/CDF) on the birth of their son Eduardo Fichtner. Eduardo was born on May 15, 1993 at 1:05 a.m. at Mercy Center in Aurora. He is welcomed by sister Mariana.



## Lecture Series

William Cronon has long been examining the ways in which human communities modify the landscape in which they live and how people are in turn affected by changing geological, climatological, epidemiological and ecological conditions. His lecture at Fermilab's Ramsey Auditorium on Friday, June 25 is based on the research used in his award winning book, *Nature's Metropolis: Chicago and the Great West*.

The book, written in 1991, looks at Chicago's relationship to its rural hinterland during the second half of the nineteenth century. In 1991, it was awarded the *Chicago Tribune's* Heartland Prize, won the Bancroft Prize for the best work of American history, and was one of three nominees for the Pulitzer Prize in History. Dr. Cronon incorporates slides and visuals in his lecture.

Admission to *Nature's Metropolis: Chicago and the Great West* is \$3.

## Sitewide emergency exercise at Fermilab

The Office of Emergency Planning, together with a scenario committee composed of representatives from every division and section, is planning a sitewide exercise to be held at Fermilab this summer. The primary purpose of the exercise is to test the Fermilab Emergency Management System. It will also allow us to evaluate the effectiveness of local area plans.

What do you do when you hear a warning signal? Once you decide what the signal means do you take appropriate action by going to the shelter or evacuating the building? Or do you decide it is probably either a drill or false alarm, so what's the hurry?

Although it may well be that some events are either a drill or false alarm, the OEP wants to alert all personnel to the fact that it is possible for a real emergency to occur on the site. Everyone, including Fermilab employees, contractor employees and visitors are expected to respond to any warning sound as though it were a real event.

**Romesh Sood**, head of OEP, says that with this in mind, evaluators and controllers for the exercise will be closely monitoring actions taken and suitability of responses to a particular situation. Know your local area plan, be aware of the location of your shelter and know where to exit if evacuation is ordered. Don't be a "victim" because you weren't sure what to do. If you have any doubts about what to do in an emergency, OEP encourages you to check with your local emergency warden or your senior safety officer.

—Hazel Cramer

## First health fair a success

On May 12, 1993 the health fair presented by the Fermilab Wellness Committee was a whopping success.

Fermilab employees received a wealth of information on health related issues as well as various screenings and a relaxing massage. Plans are underway for next year's health fair. Thanks to all who participated.

—Mae Strobel

## Harper's Index

Average percentage increase in the bounce of a golf ball that has been passed through an electron beam accelerator: 5.

## Collider detectors Continued

year, these experiments have collected data at intensities never before seen.

CDF held up very well, with no major problems after the early commissioning phase of the run. **Jim Hylen**, who was co-operations manager for the run, along with **Rob Plunkett** and **Steve Hahn**, said the operational efficiency of the detector was around 80%. This, along with the increased performance of the Tevatron, allowed CDF to write data for  $21 \text{ pb}^{-1}$  of integrated luminosity, an unprecedented figure and nearly 70% of the total luminosity delivered by the Tevatron.

Rob Plunkett, who will also be working with CDF operations for the next collider run, said that two major improvements are scheduled for the detector this summer. The Silicon Strip Vertex Detector, the new addition to CDF that allows particle tracking down to the scale of about 30 microns, is being replaced with a radiation-hardened version. Though the SVX showed little degradation during the past run, the new SVX “prime” should be more reliable. The other improvement scheduled for this summer is a major upgrade in data acquisition.

Like CDF, the  $D\bar{O}$  collaboration had few problems after the commissioning stage of the run. Unlike their companion detector, however,  $D\bar{O}$  had never before seen a particle beam. The ease and speed with which the detector went from an unassembled collection of pieces to a world-class detector taking hard physics data is a testament to the dedicated people working in the  $D\bar{O}$  collaboration.

**Rajendran Raja**, the convener of the Top Quark Group at  $D\bar{O}$ , is very pleased with the past year’s work. “I think  $D\bar{O}$  had a very productive run,” said Raja. “People thought we would spend a lot of time in the engineering phase—but we didn’t.”

With nearly  $17 \text{ pb}^{-1}$  of integrated luminosity information written to storage tapes,  $D\bar{O}$  has an enormous amount of data to analyze. Some of the most interesting information is in the approximately 15,000  $W$  bosons and 1,500  $Z$  bosons recorded.

Raja said that the upgrades for the coming collider run would center around eliminating cosmic ray “noise” by installing detectors to screen these false signals and im-

provements to the electronic triggering system (the system that decides if an event is “interesting” or not).  $D\bar{O}$  would also like to be able to avoid some of the problems associated with interference from the Main Ring.

And the top quark? Well, the search for this elusive particle is likely to last longer than an NBA season. Right now, both collaborations are preparing to set lower limits on just how “heavy” this fundamental particle will have to be, but neither group has seen the quark, at least not conclusively.

## A warning about watching for weather warnings, watches

In another of a series of articles concerned with severe weather here in Illinois during the summer months, we would like to go over the differences in the National Weather Service’s weather advisories for tornadoes and thunderstorms.

At work and at home, you should be aware of the weather advisories for your area.

The National Weather Service maintains a National Severe Storms Forecast Center (NSSFC) in Kansas City, Mo. Here meteorologists monitor atmospheric conditions in North America using information from hundreds of ground locations, weather radar, satellite photographs and reports from pilots. When severe weather conditions are detected, the NSSFC or local National Weather Service offices issue watches and warnings for threatened areas.

A thunderstorm or tornado **watch** is issued when and where these weather conditions are *most likely to occur*. This means that conditions are favorable for severe thunderstorms or tornadoes. Since all severe thunderstorms have the potential to produce tornadoes, these advisories are often issued together, but even when they are not, the potential for dangerous thunderstorm weather or tornadoes is always present during a thunderstorm watch.

Watches are typically issued for areas of

about 140 by 200 miles. Especially during a tornado watch, you should be alert for signs of threatening weather and make preliminary plans for action. Keep tuned to local weather broadcasts for further information.

Despite the lack of a conclusion to the top quark search, both CDF and  $D\bar{O}$  are pleased with their performance during the last accelerator run and are excited about the many other results that are beginning to come from the data. Both are looking to the future—and the possibility of “game seven!”

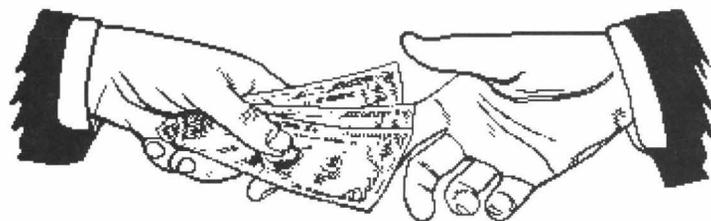


Warnings are issued by the local National Weather Service (in our case located in Rosemont, IL) when severe weather is actually indicated by radar or reported by other reliable sources. A large part of these “other sources” are trained spotters using SKYWARN spotter networks. These networks are composed of volunteers such as Amateur Radio and Citizen’s Band radio groups in conjunction with police, fire and Civil Defense personnel. If you see a tornado or funnel cloud and can do so safely, report it immediately to your local authorities and ask them to relay your report to the National Weather Service.

Warnings for both thunderstorms and tornadoes are given for specific areas of risk from the identified severe weather. This is determined from the location, size, direction and speed of movement of the storm (which can be erratic). Listen closely to any information contained in a weather warning. At times, you may be in or near a warning area but are experiencing no severe weather—this does not mean that you are free from risk. Tornadoes and thunderstorms can move rapidly and erratically. You should be prepared to take cover whenever a weather warning has been issued.

# More payout choice added to your pension plan

Effective June 1, 1993 plan participants who terminate employment may elect to receive a full cash distribution (Lab & employee contributions) from their



CREF accounts and from their TIAA accounts to the extent allowed by TIAA under the old and new plans, as long as certain conditions are met. In order to receive a full cash distribution at termination of employment, you must be at least 55 years old and your combined age and years of service must be greater or equal to 65. The minimum service requirement is three years. For pension plan distribution purposes the years of service do not have to be continuous.

Plan participants who do not meet the age and service requirements and have funds in the old plan's TIAA-CREF Retirement Annuities can elect a cash distribution from their CREF accounts and from their TIAA accounts to the extent allowed by TIAA of employee's contributions only. The Laboratory's contributions in the old and new plans can be paid out as life annuities or as fixed-period annuities.

These changes do not replace any of the other payment choices currently available through TIAA-CREF Retirement Annuities. Following are examples of payment choices that employees may have at termination of employment.

Example 1: Employee age 57 with eight years of service terminates employment and has TIAA-CREF Retirement Annuities in Fermilab's old and new pension plans. This employee's payout choices are: a.) full cash distribution from all CREF accounts and from TIAA to the extent currently allowed (payments over 10 years), b.) CREF fixed-period payout annuity that can provide an income between five and 30 years and from TIAA accounts over a 10 year period, c.) TIAA-CREF one life or two life annuities that can provide an income for life, d.) cash payment equal to 10% of all accounts and the balance paid out as one or two life TIAA-

CREF annuities or e.) TIAA interest only payout that can later be changed to a 10 year payout or a one or two life annuity.

Example 2: Employee age 45 with 10 years of service terminates employment and has TIAA-CREF Retirement Annuities in Fermilab's old and new pension plans. This employee's payout choices are: a.) from the old plan a cash distribution of the employee's contributions in all CREF accounts and from TIAA to the extent allowed (currently payments over 10 years), b.) from the old and new plans the Laboratory's contributions in all CREF accounts can be paid out as a fixed-period annuity that can provide an income between five and 30 years and TIAA accounts over a 10 year period, c.) from both plans TIAA-CREF one life or two life annuities that can provide an income for life, d.) one time payment equal to 10% of all accounts and the balance paid out as one or two life annuities and e.) TIAA interest only payment which can later be changed to a 10

year payout or a one or two life annuity.

These examples are merely an overview of various TIAA-CREF Retirement Annuities payout options currently available through the Laboratory's pension program. A more detailed description of the payout choices is available from TIAA-CREF. Call them at 1-800-842-2733 and request a copy of *Comparing TIAA-CREF Income Options*.

For employees nearing retirement, the Benefits Office has available two videos, *Fulfilling the Promise...Your TIAA-CREF Income Options*, which describes the choices available and kind of person for whom each might be most appropriate, and *On the Road to Retirement—Receiving your TIAA-CREF Retirement Benefits*, which offers guidelines for evaluating the various choices and arriving at the option that's right for you. For a better understanding you may want to request benefit illustrations from TIAA-CREF and view the videos along with your illustrations. Call TIAA-CREF at 1-800-842-2777 for benefit illustrations.

If you have any questions, other than the tax consequences of various options, please feel free to call the Benefits Office at x4361. Consult your own tax advisor before electing any pension payout option because the tax consequences and IRS grandfathering rules may vary between options.

—Paula Cashin

## Sherry Hickey receives contest "Cheers"



Photo courtesy of the Aurora-Beacon News. sent to the Beacon by a friend. For this honor, Sherry received a \$25 gift certificate to Cheers II in Warrenville.

By glancing at this photo you might think that Rhea Perlman (Carla of the television sitcom Cheers) is coming to the Lab, but look again, it really is Fermilab's own **Sherry Hickey** (TS/Conv Mag), the "spitting image" of the feisty barmaid. Sherry recently received first-place honors in a contest held by the Aurora Beacon-News to find Fox Valley residents who could actually be on the show because of their looks and personalities. Sherry was chosen based on a nomination

### New in the Library:

*Reinventing Government: How the entrepreneurial spirit is transforming the public sector.* David Osborne. New York: Plume, 1993. JK469 .O62 1993, main.

*Neutrino 92: Proceedings of the 15th International Conference on Neutrino Physics and Astrophysics*, Granada, Spain, June 7-12, 1992. Amsterdam:North-Holland, 1993. QC794 .N399 1992, main.

*HEACC'92 Hamburg: XVth International Conference on High Energy Accelerators*, Hamburg, Germany, July 20-24, 1992. Singapore: World Scientific, 1992. QC786 .IN81 1992, main.

*Advanced Technology and Particle Physics: Proceedings of the International Conference on Advanced Technology and Particle Physics*, Como, Italy, June 22-26 1992. Amsterdam: North-Holland, c1993. QC785.5 .I573 1992, main.

*Dynamics of the Standard Model.* John F. Donoghue, Eugene Golowich, Barry R. Holstein. Cambridge: Cambridge U. Press, 1992. QC794.6.S75 D66 1991, locked cases. Transparencies—

*2nd International Workshop on Physics and Experiments at Linear e<sup>+</sup> e<sup>-</sup> Colliders*, Waikoloa, Hawaii, April 26-30, 1993. Honolulu: LCWS, HEP Group, Hawaii U., 1993. Transparencies Reference.

Missing journal—

Please check your offices for the following single issue of *Nuclear Physics*, vol. B337, no. 2, 1990, which is missing from the Library.

E-mailing search results—

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To get a list of the most recent preprints, use the catalog's "Search Mode." Search by the latest Tuesday, e.g.: FINDPREPRINT AND CATALOGED 15-JUN-1993.

**Ferminews**

## Classified ads

### Vehicles

**1984 Cadillac Seville Elegante**, loaded, cellular phone, good condition, some rust, 114K miles, \$1,900 o.b.o. Contact Eric at x4663 or evenings 708-820-2667.

**1983 Mazda RX-7 GLS-SE**, beautiful sports car, AM/FM, cruise, excellent condition, asking \$2,800. Send message to ddimitri@adcalc.fnal.gov or almond::ddimitri, or call x2394.

**1979 BMW 528i**, perfect condition, California car, 4 speed, air, beautiful leather interior, 76K miles. No rust, \$3,990; **1973 Mustang convertible**. Perfect original condition, very low miles. Baby blue, stored every winter and used very little. PS, PB, PW, AC, 302 V8. If you want a toy you can love, this is the car, \$9,500. Call 708-983-5817.

**1992 Dodge Caravan**, front wheel drive, automatic 3.0-V6 engine w/ 18K, 7 passenger, 2 built-in child seats, AM-FM w/ cassette, air, tilt/cruise, luggage rack, \$14,000. Contact Barb at x3492 or 708-859-8699 .

### Miscellaneous

Wanted: part-time very **handy man** to assist w/renovating & caring for a small estate in Oswego. Could be full-time this summer. Prefer semi-retired man who loves diversity of tasks and loves to work in a beautiful place. Respond in writing to MS 320.

**Upright piano**, good condition. Great for beginners, \$250. Call Olga at x3101 or 708-305-8131 evenings.

**Computer case**, full tower case for IBM compatible upgrading, w/300 watt power supply, 7 snap out bays w/rails, 2 cooling fans, air cleaner. Brand new, still in box, paid \$200, asking \$100. Call Mike at 708-393-3239.

**Books:** field theory, group theory, many phys. reports, call x2394.

Tasco 4.5" **reflector telescope** and tripod, w/ 2 eye pieces - 45x and 225x. 2x barlow lens. \$110 Call George Simon, 708-983-5029.

Toyo 45A **aluminum field case**, \$80; Zone VI 4x5 **photographer's apron**, \$10; Sun Dog **padded camera fanny pack**, \$20; LumiQuest ultrasoft **flash bounce**, \$15; Sunpak Thyristor auto 522 **electronic flash**, \$75; Canon FD **rear lens caps**, \$1 ea.; Canon macro **auto ring**, \$22; Calumet **accessory pouch** (P14000), \$15; Bogen older 3055 **ball head & quick release plate**, \$8; Canon **auto bellows** w/double cable release, \$130; Canon **attachment ring 52**, \$15; Sony M-440 V **microcassette-corder** w/3 cassettes, \$30. Call Tom at x3145.

**Men's brown leather jacket** by Members Only, size 46, worn only twice, \$300. Call Shelley at x3324.

**Golf clubs**, irons, Wilson 1200, 3-9 & W, new grips, good condition, asking \$145. Call Glenn at x3725 P596.

**Commodore 64c**, 1541II disk drive, monochrome monitor, printer, lots of software. Any reasonable offer; **Atari 400** w/improved keyboard, extended memory, joystick & lots of software. Any reasonable offer. Call Mike at x2479 or 708-879-6095 evenings.

Woman's **diamond and ruby ring**, size 6, appraised at \$3,000, asking \$1,500. Call Richard at x3740.

### Real Estate

Retired couple wish to spend July-August in Geneva, St. Charles area. **Willing to sublet** nice 1 bedroom apt. or to house sit. Location close to Fox River/parks desirable. Very reliable. Call Elaine at x4601 or evenings at 708-208-9116.

Maintenance free exterior **two bedroom ranch**, with den, wood burning stove in living room, central air, 1.5 car garage, fenced back yard and large patio. 20 min. west of Lab. Call Barb after 5 p.m. 708-859-8699.