February 9, 1984
FERMI NATIONAL ACCELERATOR LABORATORY

FermiNews

TEVATRON I ROLLS TO PRODUCE ANTIPROTONS

Construction of the Ring Tunnel for the Debuncher and Accumulator of Tevatron I.

In his article in the last issue of **Ferminews**, Leon Lederman said "TeV I is now really rolling." That statement is true. Tevatron I is really rolling in its drive to build the highest energy collider in the world, at least until SSC comes along, and the U.S.'s only hadron collider.

TeV I's goal is to build a target station to produce antiprotons ($\bar{p}$), special focusing to collect them, beam-transport lines, two complex and elegant storage rings with beam-cooling equipment to narrow down the antiproton beam to manageable size, and all the rf accelerating and beam-handling equipment, controls and diagnostics that will be needed to make the beam do precisely what is wanted. This part is called the Antiproton Source. The project is also providing the equipment needed to make a 1-TeV proton-antiproton accelerator and storage ring out of the Energy Saver and the buildings for colliding-beams experiments at B0 (completed and in use) and D0 (not yet started). In doing all these things, Tevatron I is getting a lot of help from the Accelerator Division, Architectural Services, and Technical Support; Tevatron I is a major project for all of Fermilab.

This article will concentrate on the Antiproton Source. Six groups are designing and developing technical components for it. The $\bar{p}$ Production

(cont'd. on pg. 2)

Joel Misek tests a prototype rf cavity.

Ralph Pasquinelli and Moyses Kuchnir test a superconducting filter for the TeV I project.

Group led by Carlos Hojvat has built a lithium lens to collect the antiprotons after they are produced. They took the first lens to CERN and successfully tested it (see next issue of **Ferminews**). Since then, they have been building more lenses and pressing them up in peak field and repetition rate. They are now close to meeting the design specifications.

The magnets for the two storage rings, the Debuncher and Accumulator, are required to have unusually high precision in their fields to keep as many as possible of the antiprotons during several hours of production and storage. The magnet and vacuum group led by Fred Mills have built many models and prototypes of the four different kinds of magnets (large-aperture dipoles and quadrupoles and small-aperture dipoles and quadrupoles) and made very detailed field measurements. The quadrupoles, which are much harder, are now in good shape, and Technical Support is turning out finished magnets at an increasing rate. A lot of work has also gone into meeting the rigorous vacuum specifications in the storage rings, particularly in the Accumulator, and into a large variety of special magnets.

With the long storage times, the supplies that power the ring magnets also need to be very precise and that is one of the jobs being done by Jack McCarthy's Electrical/Electronics group. They are also developing kickers to move the beam in and out of the rings and power supplies for the kickers, the lithium lens, and many other devices. They are well along; the ring supplies have been ordered, the lithium lens supply is working, and all the other supplies and devices are on schedule.

Jim Griffin's $\bar{p}$ Acceleration Group is building special rf systems to bunch and debunch the proton and antiproton beams through a complicated series of steps. They have taken some old cavities and amplifiers left over from the late Princeton-Pennsylvania Accelerator and given them new life as part of the TeV I project. One cavity to coalesce the proton

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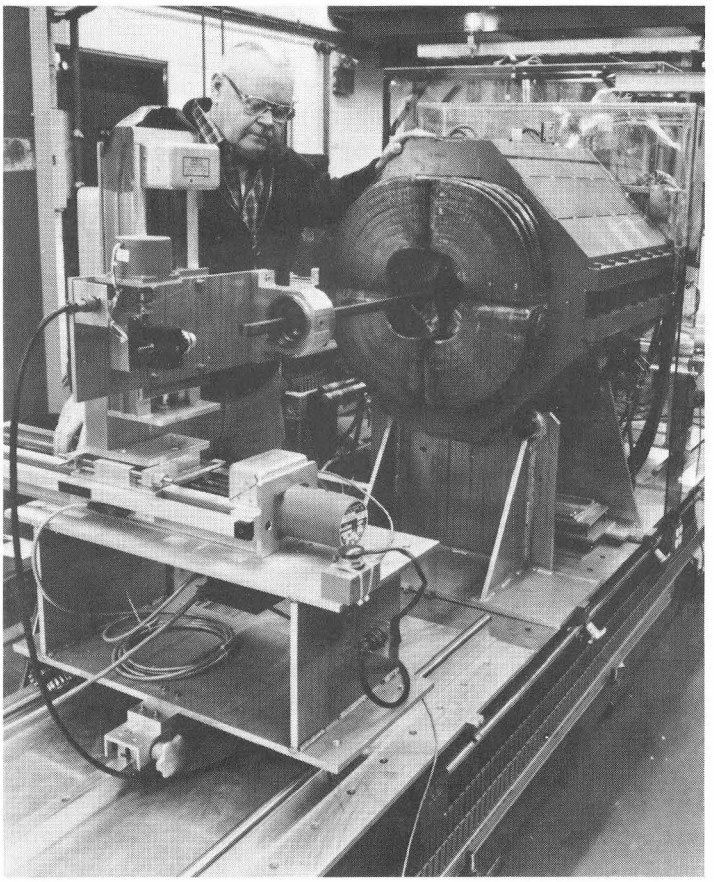


Bill Lord makes a magnetic measurement on TeV I small aperture quadrupole.

bunchers in the Main Ring before targeting is installed and operating and the second will be put in during the February shutdown. A prototype debunching cavity for the Debuncher is now undergoing tests and a new design for the Accumulator antiproton bunching cavity is taking shape.

The stochastic-cooling work is led by Bob Shafer who is collaborating with Argonne and Lawrence Berkeley Laboratories in this work. Stochastic cooling is a method of reducing the amplitude and momentum spread of the beam by picking up fluctuations in the beam and kicking it to reduce the fluctuations. The method was invented by Simon van der Meer at CERN and is used in their Antiproton Accumulator. Fermilab's system will go beyond CERN's in frequency and bandwidth and have lower electrical noise and we therefore expect to cool more intense beams. Some of the cooling equipment can be purchased from electronics manufacturers, but a lot is being developed by Fermilab's own staff and the collaborating groups. They are taking advantage of a test facility at Argonne in this development.

The controls for the Antiproton Source must manage all the beam handling and diagnostics and need in addition to fit in with the rest of the accelerator control system, because our antiprotons will end up in the Tevatron. Ernest Malamud is leading all this work, with help from Accelerator Division people.

All these components will be installed in the rings you see being built south of the Booster. In spite of a terrible winter, construction of the tunnels is close to schedule and TeV I will start occupying sections in a few months. All of the work will come to fruition beginning about a year from now when the Antiproton Source is commissioned. The Laboratory looks forward to a splendid career for the Antiproton Source as the means for physics experiments in a new energy range.

WOODRUFF TALKS ON ARMS CONTROL

The present status of the country's ability to deter military aggression will be described by Dr. Roy D. Woodruff of Lawrence Livermore National Laboratory in a lecture, "Arms Control and Strategic Options for the 1990's" at Fermilab on Thursday, February 9, at 8 p.m. in Ramsey Auditorium.

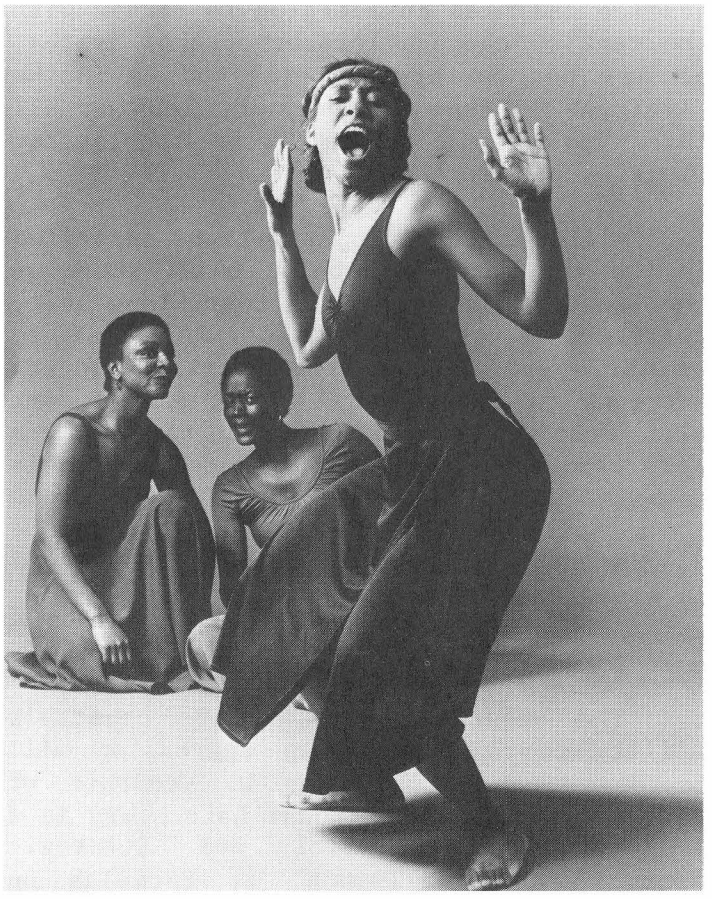
This is another in the 1983-84 Arms Control and International Security lecture series being given at Fermilab. The purpose of the series is to present varied opinions, comments, and evaluations about arms control problems for the public's benefit.

Woodruff is Associate Director for Nuclear Design at Livermore, where he has worked since 1968. He is a member of Phi Beta Kappa and received his education at San Jose State College in his native California.

The public is invited to attend this lecture, as well as all lectures in the series. There is no admission charge and reservations are not necessary.

The series will continue on March 14 with Harry Reynolds of the Los Alamos National Laboratory speaking. On April 26, Richard Garwin of IBM will return for his second lecture at Fermilab. In May (the date to be determined), James Thomson of the Rand Corporation will speak.

AWARD-WINNING BLACK PLAY PREVIEWS FEBRUARY 25



A high school girl (Julia Simpson) relives the good times of her graduation night in the opening scene of "For Colored Girls Who Have Considered Suicide/When The Rainbow Is Enuf." The 1984 national tour of this award-winning black play is being presented by Daedalus Productions of New York.

by Jane Green

"An overwhelming evening of theatre" comes to Ramsey Auditorium with Ntozake Shange's production of "For Colored Girls Who Have Considered Suicide/When the Rainbow is Enuf" at 8 p.m. on Saturday, February 25, 1984. Poet Shange's play, filled with jazz, soul, and salsa, is a celebration of being black and being woman. "For Colored Girls Who Have Considered Suicide/When the Rainbow is Enuf" opened on Broadway in 1976 to rave reviews and ran for two years. In a series of dramatic scenes, many danced and sung, but most spoken with simple directness and fierce passion, "For Colored Girls Who Have Considered Suicide/When the Rainbow is Enuf" spotlights seven "sisters," their tasks, trials, and loving moments. The piece speaks of simple things, of jealousy and friendship, of childhood dreams, and the often painful road to adulthood. The emotions are strong here and so is the language. Altogether, it has been acclaimed as "one of the most moving and original plays"...a "richly theatrical anthem to the inner strength and resiliency of contemporary black women."

Don't miss the opportunity to experience "For Colored Girls Who Have Considered Suicide/When the Rainbow is Enuf" for as one critic noted, "It should be seen by the whole country!" Admission is $6, and tickets are available at the Information Desk in the atrium of Wilson Hall. For phone reservations or additional information, call ext. 3353. Phone reservations are held for five days, but due to ticket demand, those reservations not paid for within five working days will be released for sale.

"CHOOSE TO LOSE" A SUCCESS

A year ago, 60 employees embarked on Geneva Community Hospital's "Choose to Lose" weight loss program. Part of the hospital's "For Better Health" program, "Choose to Lose" emphasized slow, permanent weight loss by changing habits. Susan Wickstrom, a registered dietitian, led the classes.

Now that the year is up, the question arises, did it really work? Yes, it did and the value of the program is really immeasurable. Here are the results--judge for yourself: Of the 60 in the program, 52 lost weight, 5 gained, and 3 stayed even. Total pounds lost 450-1/2, for an average loss of 8-3/4 pounds; 26 employees reached their goal.

Our heartiest congratulations to all the losers!

TWO-STEP TO BARN FOR COUNTRY DANCE

NALREC presents a Country-Western night, in the Village Barn, Friday, February 24, featuring the White River Band. Food and beverages will be served starting at 5:15 p.m., and music and dancing will begin at 7 p.m.

White River is one of the best country-western groups in this area and play contemporary as well as older songs. Some country-western dance lessons will be given at intermissions.

ORCHID SOCIETY SHOW TAKES BLAHS OUT OF FEBRUARY

The Batavia Orchid Society is sponsoring an Orchid Show on Saturday and Sunday, February 11 and 12, that will draw exhibitors from many parts of the Midwest. During a February weekend last year, the atrium at Fermilab was changed into a tropical garden. An estimated 5,000 people attended.

This year's show is expected to be even bigger and better than the exhibit last year. The displays of orchids in the Wilson Hall atrium are open to the public Saturday from 10:30 a.m. to 5 p.m. and Sunday from 9 a.m. to 5 p.m.

FERMILAB GARDEN CLUB OFFICERS ANTICIPATE EARLY SPRING

by Sharon Henderson

The Fermilab Garden Club elected new officers to the Executive Council at its annual fall meeting. They are as follows: Don Trentlage, president; Ralph Swanson, vice president; Rich Klecka, treasurer; Sharon Henderson, secretary 1; and Jim Wendt, secretary 2.

The Club is organized to manage a garden area containing plots which are available to Fermilab employees, retired Fermilab employees, visiting experimenters, and employees of the security contractors. The plots are 20×40 ft and have water available. Plots are plowed yearly; however, some soil preparation is still necessary. There are currently 40 plowed plots and 40 unplowed plots available. Persons wishing to join the club should contact Jim Wendt, ext. 4441. The yearly membership fee is $1 per plot per year. The present membership is 53.

The newly elected officers are actively working on improving the garden area and encourage the current membership to contact them if they have any suggestions or would be willing to help with special projects.

Fermilab Garden Club Officers (left to right) are Ralph Swanson, Rich Klecka, Sharon Henderson, and Jim Wendt (not pictured is Don Trentlage).

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PLAYGROUP SEEKS CHILDREN AND PARENTS THREE MORNINGS/WEEK

by Ann Marriner

Playgroup, the Fermilab parents' cooperative for children, has moved from its former home to new quarters across the foyer of the Curia in the Village. Since the beginning of the fall session, the parents and the Laboratory have worked hard to get the new space arranged for clean, safe play and learning experiences for the children.

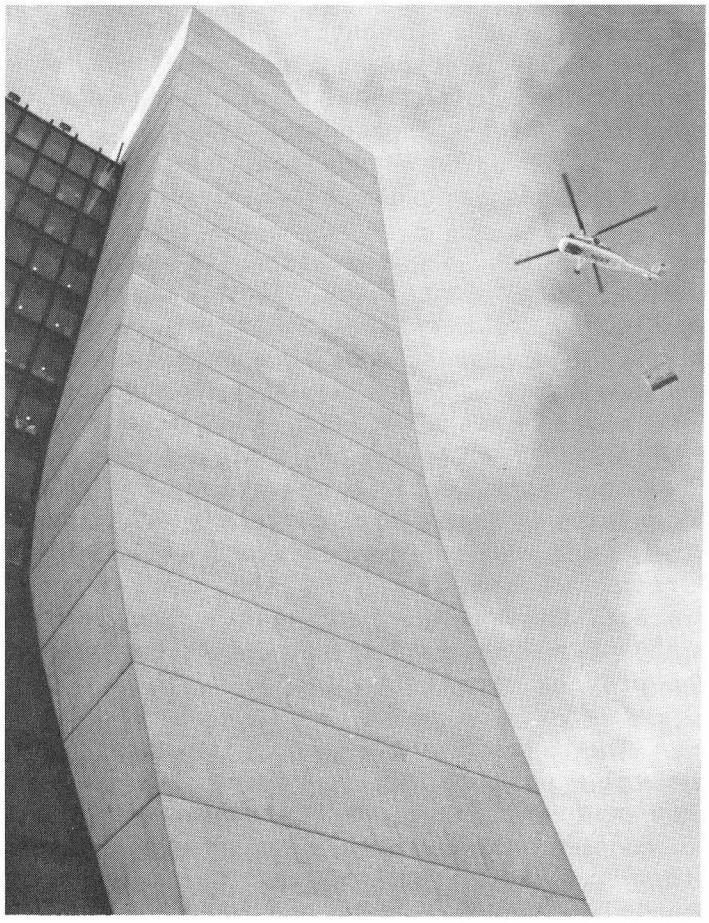
Playgroup meets three mornings per week and, because it is staffed by parents, the charge is only $4 per month to cover the cost of snacks and materials for activities. Children ages 18 months to 5 years are welcome from 8:30 a.m. to 11:30 a.m. on Monday, Wednesday, and Friday. A parent must be able to be part of the "staff" on a regular basis one morning per week.

There is room for more children and parents to join Playgroup. Interested families should contact Ann Marriner at 892-2741 or Liz Spalding at 879-1295, or call Playgroup when it's open at 840-4886. Please feel free to stop in Monday, Wednesday, or Friday morning to see what's going on!

TRANSPORT HELICOPTER MAKES LIGHT WORK OF HEAVY-DUTY JOB

At 10:45 a.m. on Saturday, January 7, a transport helicopter landed in the west parking lot to lift four 3,400-pound variable-speed drive controllers to the roof of Wilson Hall. By 12:10 p.m. the entire operation had been completed with the four lifts taking only 55 minutes.

According to Bill Riches, these new drive units were purchased as part of a DOE-funded energy conservation project and will replace the present constant speed drive units which power the main Wilson Hall air conditioning and ventilation systems on the 16th floor, with a resultant electrical power savings of approximately two million kilowatt hours each year. The new variable speed controllers should be in operation early in February.



Congratulations To. . .

Rob (Accelerator Division, Mechanical Support Group) and Jeanine Reilly on the birth of Karen Jeanine on January 10 at Central DuPage Hospital. Karen weighed 29.5 Newtons and was 50.2 cm long.

CLASSIFIED ADS TO BE DISTRIBUTED WITH **FERMINEWS** FEBRUARY 9, 1984

FOR SUBLET: 1-BEDROOM APARTMENT IN OAK CREEK WOODS. 2 blocks south of E/W tollway in Aurora, 10 min. from Fermilab, available immediately for subletting to June 1 or can negotiate new lease w/ mgmt.; all utilities incl. stove, refrig., dishwasher, etc. $320/mo. Call James Wilson, ext. 3363 or 3364.

FOR SALE:

AUTOS: 1979 4-SP. 4-DR. CHEVETTE. Very good mechanical cond., completely rebuilt brake system, good tires, no rust, 59,000 mi. $2,600. Call ext. 3125 for more information.

1977 FORD PINTO STATION WAGON. Autom. trans., powr. steering, high miles, fair body, runs well, $1,350. Call Bill Froemming, ext. 3862 or 985-9315.

1971 CHEVY 4×4 3/4-TON PICKUP. 4-speed with 1978 350-engine, runs well, $800. Call Kevin, 879-7742 days, or 879-6577 nights.

MISC: BOBBY MAC INFANT SAFETY SEAT. Used 2 months, meets all fed. safety reqs.; orig. $50, will sell for $25 or make offer. Call Victoria Fox, 898-7482 evenings.

2 USED SNOWTIRES. Mounted on Buick rims, size H78-15. Best offer. Call A. T. Visser, ext. 3273.

NORGE GAS DRYER. 30-years old, runs fine. $25. Call Henry Schram, exts. 3198 or 3377.

For the following items call Aki Murakami, ext. 3172 or 231-1019. Technics SA-222 AM/FM stereo receiver with quartz digital synthes. tuning, 30 W̄/ch., 14 (7+7) preset push button radio select, auto or manual search pre-set, 5 LED signal strength tuning, 21 months old, $140 or best offer; loudspeaker KLH-508, 2-way vented system (8-in. + 4-in.), power 10-30 W̄, 8 ohms impedance, impregnated woofer cone, floor standing, 21 mo. old, $100/2 units or best offer.

CONN TROMBONE. Excellent cond., $175 or best offer. Call George Benedetti, ext. 3132.

WANTED: TI994/A USERS. Would you be interested in forming a TI994/A users club? If so, please contact Tom at ext. 3654.