

FermineWS

FERMI NATIONAL ACCELERATOR LABORATORY

Preparing for run more than mechanics

Collider Run I is scheduled to begin this month and it will be the first run in which both CDF and DØ will be observing proton-antiproton collisions. Collider Run I will continue, except for a two to three month interruption for the Linac Upgrade conversion, until 1993.

When the Linac Upgrade is completed in the Spring of 1993, its energy will increase from 200 MeV to 400 MeV. This upgrade together with improvements in the Antiproton Source and the Booster should make it possible to double the accelerator's peak luminosity. According to Director John Peoples, "If the mass of the top quark is less than 160 GeV/c², we will discover it. If it is greater, we will clearly show that it lies beyond that value."

Preparation for the run

In preparation for the upcoming run, considerable improvements were made to the accelerator system, collider detectors and control systems which will be highlighted in future issues of *FermineWS*. Along with these hardware and software upgrades, other very intense activities designed to increase the effectiveness of the accelerators and detectors in terms of safety, availability, reliability and maintainability have also taken place and are nearing completion. These activities, involving many employees and users, did not require engineering or construction, but rather documentation.

The Accelerator Division, Research Division and CDF and DØ experimenters have been actively involved in writing Conduct of Operations documents (COO) and Safety Assessment documents (SAD). "The preparation of these documents is a part of the Secretary of Energy's 'new culture' that when properly applied will do us some good," said Mark Bodnarczuk, Manager of the Office of Quality Assurance and Conduct of Operations.

Operating within a safety envelope

When operating a facility such as Fermilab, DOE often refers to "operating within a safety envelope." This means operating within safety boundaries or

parameters. The safety envelope has two components. The first is the thorough understanding of the design of a facility and its machines. The second is the ability to operate within the design base. Coupled with the existing Fermilab ES&H Manual (FESHM) and the Quality Assurance program, Conduct of Operations documents and Safety Assessment documents are intended to be the basis for operating within the safety envelope. SADs are formal documents prepared according to a draft DOE order. "At this time DOE does not require that we complete these documents," said Gene Fisk, editor of DØ's SAD. "We are ahead of the game." The information contained in SADs demonstrate that we have identified the hazards of an experiment or operation and assessed the risks. Conduct of Operations documents are formalized sets of procedures used by those who operate the accelerators and detectors.

Conduct of Operations

In the early days of the Laboratory, experiments were much smaller. Collaborations consisted of a dozen or so experimenters and it was possible for one experimenter to have a detailed knowledge of the detector. With the advent of larger, more complex detectors and collaborations of several hundred physicists, such individual knowledge became impossible. The formalization of Conduct of Operations documents moves the Laboratory from an oral tradition to a written tradition. "Because of the complexity of today's experiments, we can no longer rely on the 'back of the envelope' for written procedures," said Mark.

The writing of Conduct of Operations documents is mandated by a Department of Energy Order. "This is something physicists would do anyway," said Roger Dixon, editor of the DØ COO. "We have always had procedures and checklists. What has happened now is that because experiments have grown so large, the whole process has been formalized. There is so much invested in what we are doing the DOE does not want to leave it to chance."

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FNAL::TECHPUBS

The deadline for the Friday, June 5 issue of *FermineWS* is Wednesday, May 27. Please send your article submissions or ideas to the Publications Office.

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Science adventures at FermiCenter

Worried about what the kids are going to do this summer with all their free time? Puzzled about how you can spend some real quality time together as a family doing activities everyone enjoys? Well here is a solution to the annual summer dilemma.

The Friends of Fermilab is sponsoring Science Adventures, summer classes for children, families and teachers.

The Children's Adventures include programs for youngsters ages 5-18. They feature recreational learning experiences on a variety of science topics. Included in this summer's exciting adventures are activities designed to teach children the principles of aerodynamics, weather, laser images and holograms, the prairie habitat, life in a savannah or pond ecosystem and much more.

Family Adventures are designed to encourage children and their adult guardian(s) to explore science together. Sign up for one of this summer's two classes, *The Nature Journal* or *Nature Photography*. The whole family can learn the joys of close-up nature photography or discover how nature sketch-



Summer 1992

ing and writing can improve your powers of observation and memory.

Starting in June, a variety of Teacher's Adventures are offered that are guaranteed to renew the spirit and send teachers back to the classroom with fresh, exciting ideas.

A pamphlet outlining all course offerings and registration materials are available from the Fermilab Education Office, MS 777, x8259. The deadline for summer registration is Wednesday, June 10.

June is FermiMonth at SciTech

During June the weekend lecture demonstrations at SciTech will be performed by Fermilab scientists, engineers and technicians. These entertaining demonstrations are held twice every Saturday and Sunday in SciTech's new auditorium overlooking the Fox River. The auditorium on SciTech's upper level seats up to 70 people.

SciTech has been having two Saturday shows (1:30 and 3:00 p.m.) and two Sunday shows (1:30 and 3:00 p.m.) almost every weekend since it opened in June 1990. Audiences vary from 20 to standing room only crowds of over 70.

Most of the shows have been on Chemistry but SciTech is broadening the subject matter to include physics, engineering, technology, wild life, mag-lev trains, magnetic credit cards, etc.

FermiMonth will follow the successful format of NALCO Month and AMOCO Month. Each of these is due to be repeated and the SciTech staff is starting to organize an Argonne Month.

The current schedule is the following:

- Saturday, June 6: *Electricity Show*, Dr. Vladimir Visnjic, Fermilab Accelerator Physicist.
- Sunday, June 7: Topic to be announced, Professor Greg Snow, University of Michigan and Fermilab experimenter.
- Saturday, June 13: *The Galileo Mission: To Jupiter the Hard Way*, Bill Higgins, Fermilab Engineering Physicist and President of the Chicago Space Frontiers Society. Mr. Higgins will bring meteorites to pass around.
- Sunday, June 14: *The Fermilab Cryogenics Show*, Mike Urso, Senior Technical Aide, graduate of the University of Illinois with 15 years experience in cryogenics.
- Saturday, June 20: *Science Game Show*, Miriam Bleadon, Fermilab Electrical Engineer.
- Sunday, June 21: To be announced.
- Saturday, June 27: To be announced.
- Sunday, June 28: To be announced.

Fermilab Arts Series presents American music festival

The Fermilab Arts Series is proud to present a summer filled with music that is uniquely yet diversely American. Plan to take part in our summer festival, a potpourri of musical offerings from across the United States—from the infectious joy of Cajun music to traditional music of the Appalachians featuring the hammer dulcimer, and closing the summer with red hot blues.

Beausoleil, Saturday, June 27

Fiddler Michael Doucet and Beausoleil, the country's leading Cajun band, have been responsible for spreading the sound of Cajun music around the world. The mass appeal of this septet has garnered multiple Grammy nominations and praise from publications from the *Washington Post* to *Rolling Stone*. Beausoleil has performed at events ranging from President Carter's inauguration to a Mardi Gras concert with the Grateful Dead.

Malcolm Dalglish & Helicon, Saturday, July 18

Malcolm Dalglish has reached a wide and diverse audience with his hammer dulcimer performances and his recordings on the Windham Hill label. He was billed as the Best Stringed Instrumentalist in 1986 by *Frets* magazine. As a composer, he has been commissioned to write pieces for George Winston and Pilobolus. Helicon, an instrumental ensemble whose mission is to cultivate and interpret folk music from around the world, was formed in 1983. The three musicians, performing on flute, hammer dulcimer, and guitar/fiddle have expanded the boundaries of traditional music, combining exceptional technique, extensive research and an unerring instinct for good tunes.

James Cotton and his Acoustic All Star Trio, Saturday, August 22

The Legendary James Cotton visits Ramsey Auditorium in August with an Acoustic All Star Trio, tentatively including Pinetop Perkins, a living legend of blues piano. Cotton has played with the best in his field, including 12 years with Muddy Waters, tours with Johnny Winter and Janis Joplin, and sessions with B.B. King, Howlin' Wolf and Elvis Presley.

This is the first time that the Art Series has presented a summer series, so take advantage of the series subscription price of \$27, a savings of 10%, and ensure choice seats by purchasing your series tickets immediately. Subscription orders are available by mail order, and by telephone only if paid for by credit card. Festival tickets will be filled in first-come, first-serve order. Single tickets are also available for purchase.



Malcolm Dalglish



James Cotton



Beausoleil

Spring/Fall housing deadline

The deadline for receipt of requests for Fall/Spring on-site housing is July 10, 1992. Responses will be mailed by August 7, 1992. The starting date for Fall/Spring occupancy is September 1, 1992. For further information, please contact the Housing Office at x3777, e-mail FNAL::HOUSING or FAX 708-840-2823.—Pam Fox



International Film Society

June's screenings will be shown in Ramsey Auditorium at 8 p.m. Admission is \$2.

Friday, June 12: *The Killing*

Director Stanley Kubrick's film noir production which ruthlessly chronicles a robbery and the lives of the thieves. Stars Sterling Hayden. U.S. 1956, 83 minutes.

Friday, June 26: Restored Masterpieces—a double feature

Chang: a Drama of the Wilderness

A template for *King Kong*. Merian Cooper and Ernest Schoedsack, director. Siam, U.S., 67 minutes. (Begins at 8 p.m.)

Tabu: A Story of the South Seas

In Tahiti, two lovers are doomed by a tribal edict. F.W. Murnau, director. Tahiti, U.S. 1931. (Begins at 10 p.m.)

Choosing and using eye protection

Since the beginning of 1988, 47 of Fermilab's 486 DOE-reportable occupational injuries involved the eye. Although the cost of these injuries is relatively low (2% of total), many were easily preventable.

The primary cause of eye injuries is flying particles from the working of solids such as grinding, drilling and cutting; or the suspension of settled material. One unexpected, but fairly common source is dust propelled by gusts of wind, especially as people exit buildings.

In 13 of the noted cases of eye injuries no eye protection was worn in operations with obvious eye hazards. In another 13 cases incorrect eye protection was worn (no side shields, nearby welding). In 12 cases the need for eye protection was not apparent (gusts of wind, poked self in eye). In the remaining 9 cases correct eye protection was worn but did not fully protect the employee (particle entered eye through settling).

Fortunately, adequate protection can generally be provided through use of appropriate eyewear. Safety glasses are constructed in accordance with American National Standards Institute (ANSI) Z87.1 to have lenses that are impact resistant and frames that are much stronger than regular glasses. They can further be equipped with side shields, brow guards or tinted lenses to offer additional protection. Goggles are also impact resistant and provide a secure shield around the entire eye area to better protect against hazards coming from many directions. Face shields are not in themselves protective eyewear, but are frequently used in conjunction with eye protectors. They are often used where chemical splashing may occur. Helmets are used in arc welding to limit exposure to visible and ultraviolet radiations.

Prescription safety glasses are available to Fermilab employees by using the *Prescription Safety Eyewear Request* which is available from division/section ES&H groups or the ES&H Section. Instructions are printed on the form. Non-prescription, plastic, wrap-around safety glasses, goggles, and face shields are available through the Fermilab Stock-



Safety glasses have lenses that are impact resistant and frames that are far stronger than regular eyeglasses.



Goggles provide a secure shield around the entire eye area to protect against hazards coming from many directions.



Face shields and helmets are frequently used in conjunction with eye protectors.

room. Non-prescription safety glasses are obtainable through division/section ES&H groups. Protective eyewear for welding and brazing is available through the Technical Support Section ES&H group. Protective eyewear for laser radiation must be carefully matched to the output of the laser. Please contact the Laser Safety Officer in the ES&H Section for assistance.

The most important step to eye safety is simple—wear some form of eye protection. This should be considered a requirement when there are obvious eye hazards and a recommendation for all workers, regardless of apparent exposure. (We have even had cases where employees have flicked correction fluid into their eyes!) The next most important step is to match the eyewear to the hazard. There are many situations in which basic safety glasses are simply inadequate. These tend to be high dust/particle exposure situations or where chemicals or radiation are factors.—Tim Miller

Science Education Center welcomes first visitors

Eighty-eight fourth grade students from Flossmoor District 161 were the first "very welcome" visitors to Fermilab's new Science Education Center. The Education Department moved its offices to the Center in March and April 21 marked the day for their first official student visitors.

Preparations for the visit took place over a long period of time. More than a year ago, the Flossmoor School District contacted the Education Office to request a Beauty and Charm workshop for all their teachers and administrators. After complet-

ing the workshop, the Flossmoor faculty wrote their own science curriculum which included a unit in particle physics. As the culminating activity to that unit, the students made a trip to Fermilab. Being the first to arrive, they had an opportunity to "pilot" the new interactive teaching stations.

Since its initial visitors, the Science Education Center has hosted a steady stream of eager youngsters. So far, the visitors have been from partner schools or representatives of pilot programs. Beginning next fall, schools may contact the Education Office to schedule tours of the facility.



Children visiting the Education Center work with the interactive video designed by Liz Quigg to give an overview of the work done at Fermilab.

Preparing continued

Conduct of Operations documents have now been prepared for all operations groups in the Accelerator Division and Research Division and CDF and DØ. According to Gina Rameika, Deputy Head of the Research Division, COO documents are designed to be working documents. "They will be found in control rooms and contain the procedures that operators actually use to do their work." Fermilab's COO documents have been prepared to map existing documents. "Much of what is contained in the COO already exists," said Gina. "The COO is a collection of documents that guides you through the operation of an experiment." Although CDF and DØ are the first groups of experimenters to complete COO, they will soon be required of all experiments. "In the future, they will have to be written before commissioning and operating an experiment," said Gina.

Safety Assessment documents

SADs have been prepared for the accelerator, beamlines and CDF and DØ. The editors were Dave Finley (AD), Peter Kasper (RD), Hans Jensen (CDF) and Gene Fisk (DØ). The object of SADs is to assist the Lab in maintaining a safe environment so that there is no concern off site and negligible concern on

site. The standard by which we assess safety is established in the FESHM. SADs, which deal with all safety aspects of an operation or experiment, are prepared in three stages. "First, a hazard must be identified. Second, a preliminary classification of the hazard must be made. Last, a safety analysis of the hazard is completed which takes into account any mitigation put in place. From these steps a risk assessment is determined. Consequently the technical expertise of many people was used to prepare these documents. According to Hans Jensen this has been a very cooperative effort. After the completion of the SADs, a panel led by Jeff Spalding reviews them and reports their finding to RD and AD heads

Working together toward a total management system

The preparation of these documents was a large undertaking involving many people and is consistent with the Lab's commitment for building and operating safe facilities and experiments. The Conduct of Operations, Safety Assessment documents, quality assurance program and the FESHM are all separate, but interrelated documents. "They talk to each other," said Gina. "They outline how we do business at Fermilab."

Quality corner

The Quality Assurance and Conduct of Operations Office would like to receive suggestions from employees or users on how to improve the quality, efficiency, reliability or effectiveness of Laboratory services or operations. Please send your suggestions to Mark Bodnarczuk, MS 200 or FNAL::BODNARCZUK

Fermilab Report available

The latest issue of *Fermilab Report* is now available. It features articles on colliding beam physics, accelerator upgrades, magnet technology, computer networking and education. If you would like a copy, stop by the Publications Office or call x3278.

Harper's index

Number of U.S. universities that offer a marketing degree with a specialty in golf management: 3.

Miles of fiber-optic cable laid last year, worldwide: 150,416.

Fermilab-developed software entices license agreement

On March 31, 1992, Universities Research Association (URA) executed a Nonexclusive Software License Agreement with the Brobeck Division of Maxwell Laboratories, Inc. (MLI) of Richmond, California. Brobeck Division (formerly Brobeck Corporation) has been designing and building innovative, reliable accelerators and beamline components since 1957.

The company was founded by William M. Brobeck after he left Lawrence Berkley Laboratory, where he worked closely with Ernest O. Lawrence in developing early cyclotrons. Brobeck machines are used around the world in research laboratories, hospitals and industry.

The software licensed to MLI is the package used to control the accelerators and primary beamlines of Fermilab. As a whole, this package is generally known as the Fermilab ACNET Accelerator Control System and includes programs and subprograms which provide system services, hardware diagnostics and support, software development and maintenance tools and database management and applications programs.

The license gives MLI the right to use and sell ACNET software and to sublicense its customers to use the system. It is a royalty-bearing license and the royalty revenue generated will be shared between

URA and the more than forty Fermilab employees who were authors of the software.

Bruce Chrisman, Associate Director for Administration, who was actively involved in shaping our future relationships with MLI said, "This recent license agreement with MLI is just one of the examples of Fermilab's and the Department of Energy's commitment to technology transfer."

As one of the few centers of accelerator expertise outside of the national laboratories, Brobeck Division plays an important role in the development of accelerator technology and in innovative applications. Maxwell Laboratories, Inc. believes that the major accelerator projects now under construction around the world represent just the beginning of an on-going period of vigorous development in accelerator technology. Growing demand is expected for several Brobeck Division products—including synchrotron light sources, linear accelerators, cyclotrons light sources, proton synchrotrons, insertion devices, beam optics and photon beamlines.

One of Fermilab's missions is to be actively involved with the transfer of technology developed at this Laboratory to industry. Recent federal legislation has created new opportunities for industry and federal laboratories cooperation. Partnership with companies such as MLI assists in this mission.

Fermilab to host 12th annual Industrial Affiliates Meeting

The twelfth annual Fermilab Industrial Affiliates Meeting and Industry Briefing will be held Thursday, May 28 and Friday, May 29, 1992. The purpose of these meetings is to improve communications between industry and the university/national laboratory research sector. Every spring Fermilab holds a meeting to review developments at the Laboratory and in our university-based community that may be of interest to industry.

This year the theme of the meeting will be medical technology. Fermilab technology has already contributed to medical technology in several areas. The Fermilab Neutron Therapy facility has treated more than 2000 patients over the last 15 years using fast neutrons produced from the Fermilab linear accelerator. The proton synchrotron for medicine designed and built at Fermilab several years ago is now routinely treating patients in the Loma Linda

University Medical Center in California. Industrial-scale superconductivity developed for the Tevatron was one of the cornerstones for modern superconducting magnetic resonance imaging. The Affiliates meeting this year will explore developments in medical technology and examine the possibility for more fruitful collaborations between Fermilab, the medical community and industry.

Panels on medical imaging and medical accelerators will review the current state of these fields and possibilities for the future. The Thursday afternoon panel on medical imaging will feature Dr. Paul Lauterbur of the University of Illinois, the father of magnetic resonance imaging, and Dr. Michael Ter Pogossian from Washington University, an expert on the exciting field of positron emission tomography. On Friday morning another panel will cover medical

Continued on page 8

Wilson Hall energy-saving window installation has added benefits

Fermilab recently completed a four-month project to install storm windows on all windows in occupiable space in Wilson Hall. Before the project began, **Vic Kuchler** (FESS) pledged that his section would try to make the process as “painless as possible.” According to Wilson Hall residents, who worked in the building during the installation, that pledge was upheld.

“I was surprised at how fast the installation went,” said **Joanne Hall** (BS/Purchasing). “The installers were very pleasant. They were very good about cleaning the area after the work was finished and putting everything back,” said **Angie Grevieskes** (RD/Theory). “The installation was well organized. I was not inconvenienced. They only moved my desk one foot,” said **Hemant Shah** (CD). “I can’t say it was at all disruptive during the installation,” added **Joe Kenny** (ES&H). “They came in one day, moved furniture and finished the installation the next day. Everything went very smoothly,” concluded **Marilyn Smith** (DO).

The storm window installation project was funded through the Department of Energy’s In-House-Energy-Management Program (IHEM). This program provides funds for energy conservation projects. These funds are in addition to the normal operating budget. In order to receive IHEM funding, a project proposal must be submitted to the DOE. “They select projects to be funded by weighing the merit of the projects and also the energy-saving payback,” said **Venkat Kumar**, Energy Engineer.

The Lab proposed the storm window installation project for IHEM funding because, over the years, it was recognized that, due to its design, Wilson Hall was very energy inefficient and often climatically uncomfortable for the occupants. The original construction of the sixteen-story Wilson Hall included 15 stories with floor to ceiling windows consisting of single-glazed, tempered glass mounted in steel frames. One half of the 42,600 square feet of windows are fixed while the other half

are sliding frames with inefficient felt type seals around the sliding frames. This configuration resulted in extreme amounts of outside air infiltration and inside air exfiltration throughout the year.



Storm window installation was completed in April and is estimated to save the Lab \$139,044 in heating and cooling costs during the first year.

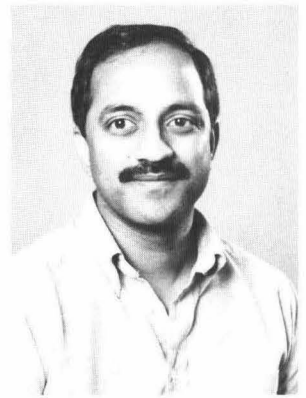
With the newly installed storm windows it is estimated that the first year dollar savings will be \$139,044 with an annual energy savings of 37,230 MMBTU. According to Kumar, the annual dollar savings should add up to a 4.29 years simple payback. This means that in a little over four years the money saved due to more efficient energy use will pay for the project.

Along with the substantial energy-savings estimates for this project, there are some additional benefits according to those who work in the building. “It was warmer this winter,” said **Marilyn Smith** (DO).

“It was not as cold when I touched the glass and it was far less drafty,” said **Hemant**.

Cyndi Rathbun (LS/PIO) said she has not noticed a comfort-level difference near her desk probably due to her proximity to the atrium and exterior doors. She did, however, comment on the tinted solar film which was installed along with the storm windows to reflect the heat load. “I thought the film would make everything look gloomy, but it really hasn’t. I got used to it very quickly,” said **Cyndi**. For **Joanne**, **Angie**, **Joe** and **Hemant** it was better than just getting used to the film. “I am really pleased with the film,” said **Angie**. “It blocks the sun and I don’t have to constantly adjust the blinds.” **Joanne** and **Hemant**, who have desks located near the windows, said it has really cut down on the glare on their computer terminals.

The Department of Energy is committed to supporting energy conservation programs and has set an energy reduction goal of 10% for all DOE building by 1995. Through out its history Fermilab has shown leadership and initiative in the area of energy conservation and is a past recipient of the DOE IHEM program award for the best energy management program at a Laboratory.

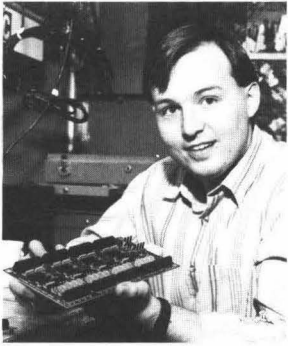


Venkat Kumar is Femilab’s Energy Engineer. It is his responsibility to evaluate energy conservation suggestions and initiate engineering studies for complex project suggestions; develop retrofit projects for energy conservation at all the different facilities site wide; and prepare project proposals for DOE IHEM funding

Kumar joined the Fermilab Facilities Engineering Services Section last December and is part of the Engineering and Planning Group lead by **Steve Krstulovich**.

Kumar, a mechanical engineer, has a BS in engineering received in India and an MS from Marquette University in Milwaukee, Wisconsin.

Prior to joining the Fermilab staff **Kumar** worked for a Milwaukee-based engineering consulting firm.



Steve Anderson(AD) was the recipient of a first prize award in the University of Illinois Chicago (UIC) Electrical Engineering Senior Design Project competition. The annual competition is sponsored by the Professional Engineering Society and the UIC College of Engineering. Participation is required of all senior engineering students across all disciplines. This year's competition was held April 28.

Steve's award-winning design was a solenoid cannon using magnetic propulsion. This design was achieved by shorting charged capacitor banks across a solenoid. The resulting magnetic field was then used to "pull" a bullet-size projectile through the solenoid.

Steve is a past Summer Internship Program participant and currently works part time in the Controls group under the supervision of Bob Ducar. Steve will graduate on May 9.

Hotline

U.S. Department of Energy
Office of Special Projects,
Office of Environment,
Safety and Health

Tiger Team Assessment
Complaint-Line for Fermi
National Accelerator
Laboratory

Are you aware of
environment or safety and
health problems?

Call the Tiger Team
Assessment Complaint-
Line: 708-840-8600

Period of operation:
May 11 - June 2, 1992

Reporting of fraud, waste,
abuse, misconduct and
environmental issues of a
criminal nature can be
reported directly to the
Inspector General at 1-800-
541-1625, 202-586-4073 or
FTS 8-896-4073.

FIA meeting continued

accelerators. Charles Ankenbrandt of Fermilab will review the possibilities for future medical accelerators while Dr. Michael Goitein of Harvard will discuss their plans for a new accelerator facility. Arlene Lennox of Fermilab will review medical applications of proton linear accelerators.

There will also be reviews of progress on the new Fermilab Main Injector project, an important element of Fermilab's future. Other speakers will cover some of the new cooperative industry/national laboratory developments of the last year. In addition to the presentations there will be tours of Fermilab facilities and exhibits featuring other new technology developments.

Classified ads

Automobiles

1985 Toyota Tercel 4WD Wagon, 74k miles, excellent condition, AC, cassette player, new tires. Original owner, must sell - leaving country, \$3,000 obo. Call x2426.

1989 Pontiac Bonneville, about 30K miles, looks and runs like new, \$9995 obo. Call Chuck at x2271 or 708-879-0394 evenings.

1990 Oldsmobile Silhouette Minivan, 19k miles, great car, excellent condition. FE3 touring suspension with Goodyear Eagle GT+4 tires, AC, cruise, cassette player, power locks. Must sell - leaving country, \$14,000 obo. Call Andy or Melissa at 708-848-1628.

Miscellaneous

Camper - 1978 Rockwood (pop-up), sleeps 8, awning included. \$800 obo. Call Carol at x3961 or 708-859-0373.

Stereo console - Readers Digest 3 speed record and 8 track tape, \$50. Call Ron at X3095.

IBM Scanman Plus - with paintshow plus, still in the box. Asking \$85 or reasonable offer. Call Terry at x3118.

Soloflex - totally loaded, great shape, \$699 obo. Call 312-431-3224.

Typewriters - IBM Selectric II with new rollers, \$130. Selectric II correcting with new rollers, \$260. Old IBM model, \$50. Call 708-983-0279.

Hotpoint gas stove, white, \$150. Frigidaire refrigerator, white, \$150. Electric typewriter, \$10. Day bed, white, \$50. Call Robin at X2982 or FNAL::ROBIN.

Wanted

Roy Jeffries (CD) and his dog Cody are seeking transportation to work and home again on Weds. Morning arrival time is flexible. Home address is 370 Spruce St., Aurora. If you can be of assistance contact Roy at x3146 or 708-896-7393.

XT Computer. Call Joe at x3343.