FermiNews

July 19, 1991 Vol. 14, No.13 Fermi National Accelerator Laboratory

Senate slates $25 million for Fermilab III project in FY92

After six months of discussion, the U.S. Senate has appropriated $25 million to keep Fermilab at the forefront of high energy physics research. The FY92 funds are designated for the start of construction of the Main Injector, which will replace the twenty-year-old Main Ring.

In addition to the $25 million slated for the Main Injector, both the Senate and the House have also recommended that Fermilab receive $6.2 million to complete the Linac upgrade. The upgrade is scheduled for completion in fall 1992. The Linac upgrade and the Main Injector Project are components of Fermilab III, the plan to take the Lab and its research into the next century.

According to John Peoples, the recent Senate vote brought encouraging news. "We'll be able to move from the design stage to actual construction in the upcoming fiscal year," he said.

"We're very pleased," said Director John Peoples. "The fact that the Senate included us in the budget in this economic climate shows that they recognize the significance of this project, and we're optimistic that their support will continue."

Federal support was not always as solid. In December 1990, Congressman Dennis Hastert learned that the Office of Management and Budget had not included any Main Injector funding in the Bush administration's fiscal 1992 budget proposal. The next month, however, DOE Deputy Secretary W. Henson Moore informed Hastert that the budget had been altered to allot Fermilab III $44 million.

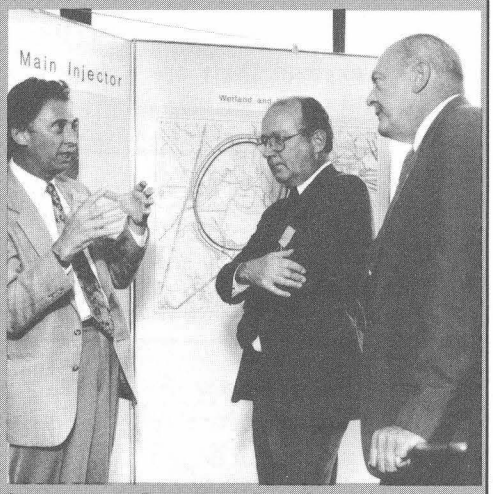
In May, the House Subcommittee on Energy and Water Development deleted $43.5 million in Fermilab III funds from the budget proposal, and the House Appropriations Committee accepted the Subcommittee's recommendation.

Thanks to efforts by Representative Hastert and other Fermilab supporters, the House of Representatives restored $10 million in Main Injector funding. Then Illinois Senators Alan Dixon and Paul Simon helped secure $25 million in the Senate's recommended budget.

Both the Senate's and the House's proposals now go to a conference committee,
Continued on page 7.

U.S. Congressmen tour Lab

Four congressmen from key House committees on science and appropriations visited Fermilab Monday, June 17. The representatives came at the invitation of Illinois Congressman Dennis Hastert.



Director John Peoples discusses the significance of the Fermilab III project with Congressmen John Rhodes (AZ) and Dean Gallo (NJ).

Representatives Dean Gallo of New Jersey, Carl Pursell of Michigan, John Rhodes III of Arizona and David Skaggs of Colorado travelled to the Laboratory for a two-hour tour of the facility. The tour was part of an event sponsored by the Illinois Ambassadors — a nonprofit organization promoting economic development for the state of Illinois.

The group toured Fermilab as guests of Director **John Peoples.** After receiving an orientation to the Laboratory, individual congressmen paired up with Physics Department Head **Jeff Appel**, Associate Director **Bruce Chrisman**, Deputy Director **Ken Stanfield** and theoretical physicist **Chris Quigg**. The scientists briefed the Congressmen on some of the construction and upgrades currently underway.

From the 15th floor, the group viewed the Science Education Center, to be completed next year. Southwest of the Main Ring, the committee members were able to view land earmarked for the Main Injector.

Informal conversation on Fermilab's current research led the group to the eighth floor where they
Continued on page 7.

Target program gives minority students head start

Talented minority students from Chicago and some of its suburbs are getting a head start this summer on science careers. These twenty-five young people are participants in Fermilab's *Target: Science and Engineering* program, a six-week apprentice research program for high school students.

"This is a program we hope will expand their options," said **Dianne Engram** (LS/EEO), who manages the Equal Opportunity Office. *Target*, which began its 1991 session on June 24, seeks to attract students to careers in the theory and process of science with a twofold approach: laboratory experience and classroom lessons.

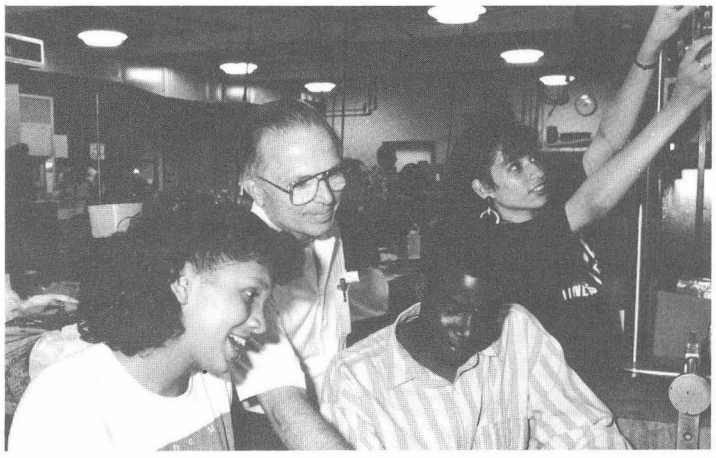
In the mornings, the students spend four hours working at various Fermilab sites. Seventeen scientists, technical staff members and engineers supervise one to three students each morning, serving as unofficial teacher, guidance counselor and mentor. "We try not to be just like school," Dianne said. "We try not to duplicate what the schools are already doing. If the students have enough opportunities, learn about enough ideas, they can help their guidance counselors guide them when they get back to school." The students are paid $5 per hour for their work.

Finley Markley (TS/Engineering), who has been a *Target* supervisor for several years, professes his faith in *Target's* potential for success. "If the students have a job that allows them to be challenged, it heightens their interest," he said. "It gives them the self-confidence that they need, the 'yes, I can do this.' "

"If the students have a job that allows them to be challenged... it gives them the self-confidence that they need."
—Finley Markley

Finley is currently challenging his three *Target* students with interesting—and necessary—work. "This year, they are mostly working on the insulating material for the Main Injector," he said. The students are testing different samples of epoxy resin for hardness, impact, index of refraction and coefficient of thermal expansion. "I have a really good bunch this year," Finley said.

Two more students are working with **Age Visser** (RD/EE Dept.), a third-year *Target* supervisor. Age also said that the program helps boost students' self-assurance. "The first week is tough," he said. "They're not used to being exposed to this kind of equipment. After a week, they get the hang of it, and they get the confidence."



Finley Markley supervises (l.-r.) Raquel Guevara, Darin Johnson and Alicia Rivera.

Another important facet of the program, Age says, is that it helps clarify scientific concepts students learn in school. "It's hard for them to relate to what they see in class," he said. "When they leave here, they have a view of what's really going on. They have a mental picture...they say they have a much better feel." Classroom lessons, then, are "not so mysterious."

Classroom lessons, made far from mysterious, make up the second part of the *Target* program. The twenty-five young people spend their afternoons at Naperville Central High School, learning about science and applying the concepts they've learned to projects they construct themselves. The students have fashioned their own holograms, put together PC boards and built radios. Physics, robotics, computer science and electronics are all within the realm of the *Target* curriculum, which is taught by teachers from Argo Summit, Naperville Central and DuPage Area Vocational Education Authority. A field trip to SciTech, a science and technology museum in Aurora, and either a manufacturing plant or Amoco's laboratories rounds out the classroom experience. In addition to wages for their summer jobs, the students receive a stipend of $40 per week for their classroom participation.

Admission to *Target: Science and Engineering* is selective. Each year for the past twelve, Fermilab has sent applications to seventy-five Chicago-area high schools and organizations. Sixty to seventy-five students, nominated by their schools, send in applications, recommendation forms and transcripts. Dianne Engram and her colleagues select

Continued on page 6.

AHA! Chicago educators discover hands-on science for kids

Fermilab has long supported science education in the Chicago public high schools, but as of this summer, elementary school science programs will benefit from Fermilab know-how as well.

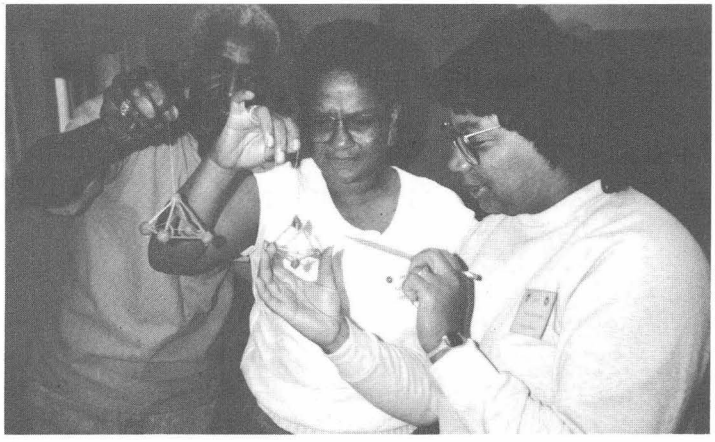
The *AHA!*, or *Academy Hands-on Science* program, is sponsored by the Laboratory and the Academy for Mathematics and Science Teachers in Chicago. The program has three formal objectives, according to an interim report: to "increase the classroom teacher's use of and enthusiasm for an inquiry-based, hands-on approach to science," to "integrate hands-on activities with texts and the established Chicago Public Schools' science curriculum" and to "acquaint teachers with the resources available at the Academy for Mathematics and Science Teachers."

"It's a brand new program this year, and a unique opportunity to influence elementary science education in Chicago," said **Kristin Ciesemier** (LS/Education Office) She added that *AHA!* is funded by a grant from the Academy for Mathematics and Science Teachers.

Kris is co-coordinating the project with Wayne Wittenberg of Benjamin Franklin Elementary School in Glen Ellyn. Wittenberg and Christine Ballenger of Forest Glen Elementary School in Glen Ellyn are serving as instructors for *AHA*'s two sessions. Three Academy teachers assist the instructors.

The class sessions, held on the Illinois Institute of Technology campus, consist of presentations covering a variety of science education topics. Presentations cover pedagogy, including whole-language, classroom management and performance-based assessment. Instructors engage the participants in dozens of hands-on activities including *Activities Integrating Math and Science* (*AIMS*). The program participants also receive an introduction to the Academy's resource center.

Each participant develops a Plan of Action during the session. The Plan of Action is a series of lesson plans that



Chicago elementary school teachers learn hands-on approach to science education.

"incorporates process science, their textbook and the Chicago Board of Education science curriculum." At the end of each session, the class instructors collect and evaluate each participant's Plan. The elementary teachers each receive a $250 grant to purchase materials or equipment for hands-on science activities included in their Plans, and each school represented acquires approximately $300 worth of resource books.

The Academy for Mathematics and Science Teachers' staff selected ninety-three elementary teachers from thirty-one schools for the program. The participants receive a $250 stipend for successful completion of the *AHA!* sessions, and may choose to earn three hours of graduate credit from Chicago State University.

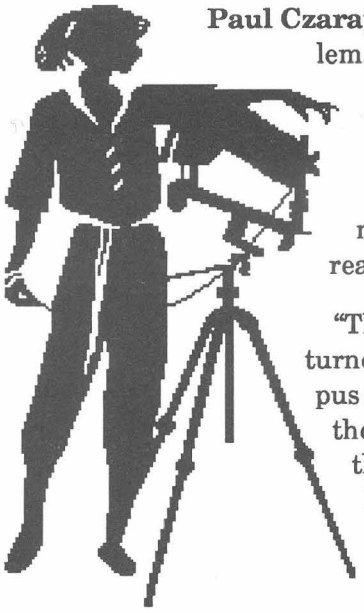
Teachers' remarks about *AHA!* have been very favorable. Comments written on evaluation forms have included: "Great;" "Exceptionally good activities demonstrated. Very useful in the classroom;" "This info. will be very helpful when I write my units" and "Best two weeks of my life." Thousands of Chicago children will see if they agree this fall, when they are treated to hands-on science lessons their teachers learned—courtesy of Fermilab and the Academy for Mathematics and Science Teachers.

Fermilab to host college fair

Representatives of seven local colleges and universities will unite at Fermilab for a college fair on Wednesday, July 24 from 11:30 to 1:30 p.m. Bring questions about career-enriching courses, degree programs, class schedules or other educational topics to the 1 West meeting room.

Institutions which will be represented at the fair include: Aurora University, College of DuPage, College of St. Francis, Illinois Institute of Technology, North Central College, Northern Illinois University and Waubonsie Community College.

Video recruits top engineers to "that physics joint"



Paul Czarapata (RD/EE) had a problem. Every year, when he and his colleagues journeyed to Stanford, Cal Tech or the University of Illinois in hopes of luring engineers to Fermilab, the same reaction greeted them.

"There would be a really low turnout when we came to a campus to interview," Paul said. "And the people who did turn out had the wrong idea about Fermilab. They'd say, 'Oh, Fermilab's that physics joint.' They didn't know that there was so much engineering going on here."

Paul encountered yet another problem when the potential Fermilab engineers hailed from certain areas of the country. "A lot of the people we recruit are from much nicer climates," he said.

The Lab's engineers had a problem, and in keeping with the spirit of Fermilab, Paul sat down and thought until he devised a way to solve it. Last fall, he decided that the best way to let engineers know what Fermilab was all about was to show them—with informative, upbeat and colorful videos. The videos would be sent to engineering departments at the top schools before the recruiters came to interview. Engineering students could watch the films, and by the time Paul or another recruiter arrived, the students would be "turned on" to Fermilab.

Paul took his idea to the Engineering Policy Committee. The committee liked the idea, so the project was turned over to **Fred Ullrich** of Visual Media Services. Fred, assisted by Paul, **Mike May** (AD/Mech. Support) and former Fermilab employee Susan Stibal, produced two videos—*The Mechanical Wonder* for mechanical engineers and *From Microwatts to Megawatts* for electrical engineers. A freelance writer and a freelance narrator added professional touches.

The recruiting tapes show Fermilab's diversity and attractiveness in several ways. Footage of engineering projects at the Linac, the Main Ring and other sites show that the Lab is much more than just a "physics joint." The narrator speaks of Fermilab as a "mega-engineering feat." The mission of Fermilab, says the video, is a "case of creating larger and larger haystacks and looking for smaller and smaller needles."

The videos laud Fermilab's "university-campus atmosphere," and explain that an engineer's work is "innovative" and "technologically sophisticated." Working at the Lab is "high adventure," but it requires "talent, dedication and hard work."

The "hotbed of challenging engineering projects," however, is not the only reason to come to Fermilab. The films tout the "ecological balance of scientific research and enhanced nature." Would Fermilab be Fermilab without baby bison, gregarious fowl and wide-eyed deer? The Lab is "an oasis amid 20th-century urbanism." Also featured are the myriad of cultural activities at Ramsey Auditorium, the lectures and seminars, sports leagues and special-interest clubs. "You cannot get bored," Paul tells the engineering students. In addition, the film highlights Fermilab's benefits package.

In both films, Employment Manager **James Thompson** tells the students about job opportunities and hiring policies. Engineers **Erika Drennan** (RD/EE), **Bob DeMaat** (RD/EE), **Peter Prieto** (AD/EE Support), **Hector Gonzalez** (CD/DA Electronic) and **Tom Jurgens** (AD/EE Support) discuss their duties in *From Microwatts to Megawatts. The Mechanical Wonder* features **Mike May**, **Kris Anderson** (AD/Mech. Support), **Terry Anderson** (AD/Mech. Support), **Regenia Richardson** (TS/Engineering) and **Kay Weber** (AD/Mech. Support).

They'd say, 'Oh, Fermilab's that physics joint.' They didn't know that there was so much engineering going on here."

Working at Fermilab offers "a great career in a stimulating environment," James Thompson tells prospective employees. "You're limited only by your imagination and your ability to grow." To convey this message to top engineering students, the Lab sent tapes to more than sixty universities.

"It takes a combination of talents, and all kinds of disciplines to get the job done," said Paul Czarapata. "Everyone I've talked to says the tapes get that idea out."

Volleyball league boasts international participation

In the spirit of Fermilab, the winter/spring volleyball league was a true international effort with participants from many nations. Represented here the languages of the players.

English: The Winter/spring volleyball league was concluded with fierce competition and fun.

Chinese: Dong1Chuen1 pai2qiu2 bi3sai4 zai4 ji1lie4jiao3zhu2 he wu2qong2le4qu4 zhong1 jie2su4

German: Die Winter/ Frühjahr Saison der Volleyball Liga endete nach hartem Wettstreit mit viel Spaß für die Beteiligten.

Greek: To xeimerino/anoiξiatiko prwtaθlhηa volleyball teleiwse mesa apo entono synagwnismo kai diaskedasη.

Hindi: Sardi aur Basant me khela gaya volleyball pratiyogita kafi hi ghanghor aur manoranjak raha.

Italian: La lega primaverile/invernale di pallavolo fu conclusa con fiera competizione e divertimento.

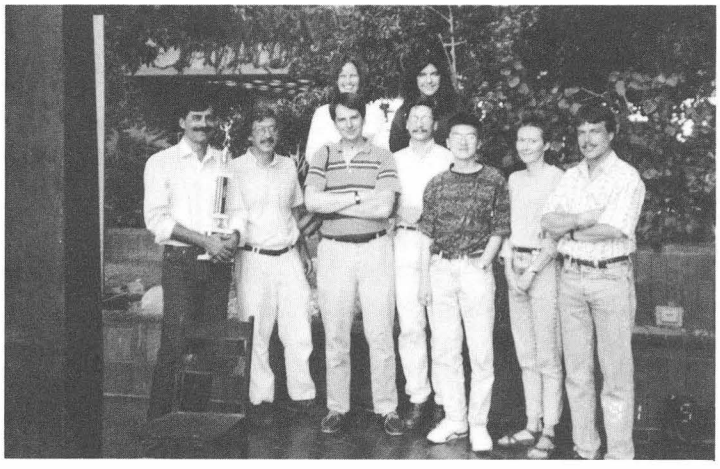
Japanese: Shuki/Toki bareiboru rigu wa nessen no naka shuryo shimashita.

Polish: Zimowo-wiosenna liga siatkowki kulminowala spietrzeniem wysilku i zwielokrotnionej przyjemnosci.

Portuguese: A liga de inverno/primavera de volei foi concluida com competicao ardente e animada.

Spanish: El torneo de volibol de invierno/primavera fue concluido con intensa competencia y diversion.

A total of nine teams participated in what was a very good season with many teams contending for top places. The league, which began last October 29th, concluded with a tournament on May 17th. The final standings are determined by total points per team with one point given per game won and an additional point given to the victor of each best-of-three match. The standings are as follows:



First place team members (front row l. to r.): Rocky Kolb, Chuck Ankenbrandt, Bryan MacKinnon, Carlos Yosef, Quian Zhu, Lucyna De Barbaro, Densley Hoffman (back row l. to r.) Linda Even and Miriam Bleadon.

Captain	Total Points
Linda Even (Construction Engr.)	80
Alma Karas (BS/Contracts)	76
Gary Andrews (BS/Safety)	70
Takahiro Yasuda (User)	66
Rene Padilla (AD/RF)	49
Josh Frieman (RD/Astrophysics)	38
Margherita Vittone (Physics Section)	24
Bill Soyars (AD/Cryo Systems)	16
Lucy Ontiveros (Directorate)	13

—***Bryan MacKinnon*** (CD/D.A. Supp.)
with a lot of help.

Nalrec presents "Taste of Fermi."

The annual "Taste of Fermi" will take place Friday, August 16 at the Users Center Grove. The menu includes Tevatron Tacos, Big Bang Hot Dogs, P-Bar Hot Dogs, Booster Brats, URA Beef, Top Quark Gyros and Main Injector Chili. Drinks will be available as well.

Feasting is not the only activity Nalrec has planned. Employees and families can enjoy Closed Particle Dancing, a trend so new it has yet to hit the hippest clubs. The Dixie Highway Band will provide the music. Nalrec has arranged adult games, with prizes for winners. Children will discover the Moon Walk and pony rides. Try your luck in a raffle, and dunk your Fermilab friends. Mark the 1991 Taste of Fermi on your calendar, and watch *FermiNews* for more information about this opportunity for family fun.

Health and fitness tip

Eating for health at a fast-food restaurant

By now you have heard that fast food just doesn't cut the mustard with nutritionists. Many fast-food restaurants, however, are changing their menus to offer healthier fare. The industry would rather join the fitness movement than fight it, so fast-food chains have introduced lean beef patties, baked potatoes, multigrain buns and salad bars. Some restaurants (McDonald's and Burger King included) now fry in vegetable oil instead of cholesterol-laden beef fat. So go ahead—visit fast-food restaurants occasionally. Just keep some tips in mind:

• Choose your breakfast carefully. Breakfast sandwiches, often stacked with sausage, eggs, cheese or ham, start your day with 300 to 600 calories, eleven to forty grams of fat and more than 1,000 milligrams of sodium. Some chains now offer low-fat, cholesterol-free muffins and fresh fruit juice, which are healthier options.

• Go for simplicity. Toppings and sauces, often mayonnaise-based, tend to be high in fat and sodium.

• Don't be fooled by the chicken and fish. Chicken and fish tend to be be lower in fat than beef if served baked or poached, but if served deep-fried, their advantage goes up in smoke. A grilled chicken sandwich on a multi-grain bun is a healthy lunch, but deep-fried chicken pieces may not be.

• Use the drive-up window. By ordering just your main course, you can round out your meal at home with vegetables or fresh fruit.

• Build your salad with caution. Salad bars often feature high-fat cheese, creamy, caloric dressings and high-cholesterol bacon bits. Even sunflower seeds pack a great deal of fat. Fill your salad plate with fresh vegetables. Top with low-cal dressing, or sprinkle with lemon juice and enjoy the veggies' natural flavors.

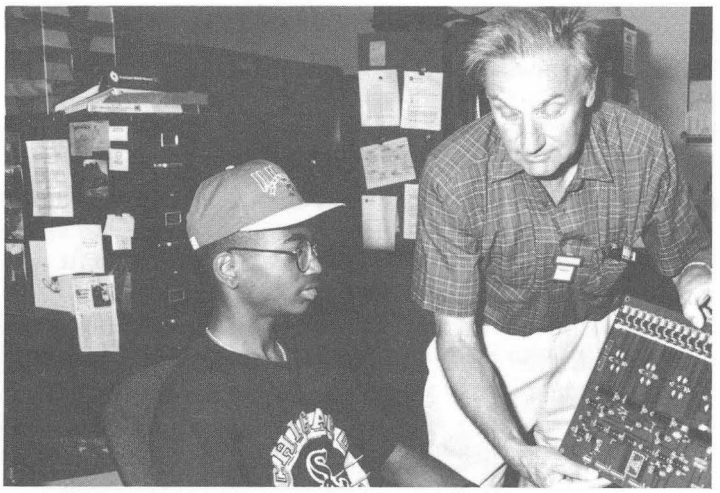
• Think of fast-food beverages as desserts. Unless you order a diet drink, most fast-food beverages—whether shakes or sodas—contain ten or more teaspoons of sugar. Try iced tea, skim milk or water.

• Balance your diet. Your health can survive a visit to the fast-food restaurant, but don't eat every meal there. If you have fast food for one meal, opt for low-fat, nutritious fare the rest of the day.

Percentage of registered dieticians who eat at fast-food restaurants once a week: 33
—American Dietetics Association

Target continued

twenty-five students from the applicant pool. "We are looking for students with a demonstrated interest in science and engineering, but not the advantages that other students might have," she said. "Curiosity about science and engineering" is one of the more crucial criteria. The majority of those selected are from Chicago.



***Target* student Walter Woods of Calumet Park works with Age Visser.**

Exposure to scientists and science seems to be an effective way to attract and to keep students' attention. The EEO conducted a *Target* follow-up study in 1987, and based on *Target* alumni responses found that 95% of the participants had enrolled in college. Eighty-five percent of the students were studying a scientific field.

Dianne said she feels that the Fermilab supervisors play a large part in guiding the students' classroom and career choices. "You never know what the student will end up doing," she said, but by working with a professional in a scientific field every morning, the students can choose to pursue or eliminate one career option. In addition, the participants can ask their supervisors how they prepared for their current position. "The supervisors help them make better selections about what to take in high school," Dianne said. "That's what separates those who go into technical disciplines from those who don't." Students who have taken the right courses, she said, are more likely to be admitted to the college program of their choice, so the supervisors who give this informal advice are "critical." The EEO reviews Lab employees' requests for summer *Target* students every spring.

Like the supervisors, Dianne said she is proud of the students. "They come to us apprehensive," she said. "They look frightened. I'm amazed at how quickly they catch on. That's the biggest reward for me."

Give it your energy.

How hot is it?

Midwestern summers are sweltering, and an air-conditioned house, apartment or office feels wonderful on sticky, airless days and nights. But do you really need to turn the thermostat so low? Overcooling is expensive and wastes energy. Don't chill out any more than you must.

When you use air-conditioning. . .

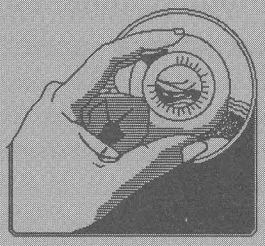
Set your thermostat as high as possible. Seventy-eight degrees Fahrenheit is often recommended as a reasonably comfortable and energy-efficient indoor temperature. If the seventy-eight setting setting raises your home temperature six degrees (from seventy-two to seventy-eight, for example) you should save between twelve and forty-seven percent in cooling costs, depending on where you live.

Don't set your thermostat at a colder setting than normal when you turn your air conditioner on. It will *not* cool faster. It *will* cool to a lower temperature than you need and use more energy.

Set the fan speed on high except in very humid weather. When it's humid, set the fan speed at low; you'll get less cooling, but more moisture will be removed from the air.

Clean or replace air-conditioning filters at least once a month. When the filter is dirty, the fan has to run longer to move the same amount of air, and this takes more electricity.

Turn off your window air conditioners when you leave a room for several hours. You'll use less energy cooling the room down later than if you had left the unit running.



Consider using a fan with your window air conditioner to spread the cooled air farther without greatly increasing your power use. But be sure the air conditioner is strong enough to help cool the additional space.

Don't place lamps or TV sets near your air conditioning thermostat. Heat from these appliances is sensed by the thermostat and could cause the air conditioner to run longer than necessary.

With or without air conditioning...

Keep out daytime sun with vertical louvers or awnings on the outside of your windows, or draw draperies, blinds and shades indoors.

Keep lights low or off. Electric lights generate heat and add to the load on your air conditioner.

Do your cooking and use other heat-generating appliances in the early morning and late evening hours whenever possible.

Consider turning off the furnace pilot light in summer, but be sure it's reignited before you turn the furnace on again.

Dress for the warmer indoor temperatures. Clothes of lightweight open-weave fabrics are most comfortable. —*Tips for Energy Savers*, DOE

Congressmen continued

were given a tour of the ACPMAPS super computer.

While at Fermilab, the representatives met and posed for pictures with high school students from their respective states who were participating in the Department of Energy's Summer Honors Program at Fermilab. The Congressmen also visited the Education Office for a review of some of the more than thirty education programs offered at Fermilab.

The tour of Fermilab concluded with a trip to CDF, after which waiting helicopters whisked the delegation away.

—*Brian Dick*

Senate continued

which will review the recommendations and work out a budget. The committee will then send the final proposal to the Senate and the House for their approval, and if granted, to the President for his signature.

The Energy and Water Development Appropriations Bill, which determines the funding for Fermilab III, is just one of thirteen bills that comprise the federal budget.

Fermilab Arts Series announces new season

The Fermilab Arts Series offers a season filled with exquisite chamber music, red-hot jazz, exciting new and ethnic dance, bone-chilling spooky stories, exotic puppetry and folk music from around the world. All Arts Series presentations are on Saturdays beginning at 8:00 p.m. in Fermilab's Ramsey Auditorium.

Jazz Harpist Deborah Henson-Conant is back by popular demand on August 10. You may remember the outstanding jazz musician and GRP recording artist from our Harp Showcase.

In honor of the 200th anniversary of Mozart's death, the Mozartean Players kick off the 91-92 Chamber Series on September 21. This outstanding trio of musicians has received international acclaim for their performances on period instruments.

AKASHA returns to Ramsey Auditorium on October 5 after their dynamic performance in last year's Choreographer's Showcase. Lauded by the *Chicago Tribune* as "charged with a powerhouse zing," this energetic young ensemble is not to be missed!

Just in time for Halloween...it's Spooky Stories. Dan Keding, Janice DelNegro and David Holt of National Public Radio fame provide a variety of tales to chill your bones on October 26!

I Musici de Montreal, relatively new on the international chamber music scene, has made quite a splash. Under the direction of cellist Yuri Turovsky, this seventeen-member string ensemble returns to Ramsey Auditorium on November 9.

The Chamber Series concludes with the Raphael Trio on January 18, 1992. This masterful ensemble made its debut in Carnegie Hall in 1975 as winners of the Concert Artists' Guild Award, and has since firmly established itself as one of the mainstays in chamber music.

You can do no wrong when you visit Ramsey Auditorium on February 22 for Ain't Misbehavin. Daedalus Productions presents this award-winning musical which examines the life and music of jazz great Fats Waller.

A different kind of jazz takes front stage on March 22 as Fermilab hosts the Eugene Friesen Quartet. Friesen, the long-time cellist of the Paul Winter Consort has even drawn the praise of Yo-Yo Ma for his beautiful playing and exquisite improvisations.

Puppetry has always been considered a supreme art form in China. See why on April 11 as the Shanghai Rod Puppet Theatre brings its rare skills to Ramsey Auditorium The puppet theatre, which uses 3' 1/2" tall puppets, has been unanimously acclaimed as the premier puppet theatre group in China.

Jazz harpist Deborah Henson-Conant performs August 10 in Ramsey Auditorium.

Listen to international harmony on May 2 with Los Folkloristas. Recognized as the world's leading interpreters of Latin American folk music, this group of musicians plays as many as 100 authentic folk instruments.

Tickets are available now for all '91-'92 performances. To make reservations, call 708-840-ARTS weekdays between 9 a.m. and 4 p.m. At other times an answering machine will give you information and a means of placing ticket orders.

— Janet McKay

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