



"CapTree" to Bloom Anew

Fermilab's 6800-acre site is rich in history and character, both natural and man-made. Representing the latter part of that history and character is the now functionally defunct Capacitor Tree (CapTree). In conjunction with Fermilab's celebration of Arbor Day, the CapTree will be "refoliated" with the last of 860 orange fiberglass boxes that simulate the CapTree's original capacitors.

An unusual species among the man-made flora in the area, the multi-trunked, six-sided structure "grows" at the intersection of Roads A and B near Fermilab's power station. "Originally, the CapTree was a power storage device, but it hasn't been used for at least 7 years," explained David Warner (*Accel. Div./Mech. Suppt.*).

There were a couple of ideas on what to do with the CapTree. One of them was to "chop" it down, but that would serve no purpose. "It's a landmark; everybody knows where it is," said Jack Lockwood (*Accel. Div./EE Suppt.*). Fermilab Director Emeritus Robert R. Wilson, who originally conceptualized the CapTree, wanted to retain it as an "aesthetic artifact; a part of Fermilab's evolution."

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Arbor Day Springs to Life

Just in time for spring, a Fermilab tradition is reborn.

Through the efforts of NALWO and NALWO's chairperson, Adrienne Kolb, and with the support and approval of Fermilab Director Leon Lederman, the Lab's celebratory Arbor Day tree planting will resume on Friday, May 12, from 11:00 a.m. to 1:00 p.m. at the Bull Rush Pond located north of the Feynman Computing Center and west of C Road.

Everyone at Fermilab is invited to join the planting; in gratitude for their efforts, participants will be given a souvenir sapling courtesy of NALWO.

The Arbor Day committee (Adrienne Kolb [chairperson], Mike Becker, Rudy Dorner, Barbara Lach, John Paulk, Avril Quarrie, Cynthia Sazama, and Ellen Lederman [*ex-officio*]) hopes for a healthy turnout of staffers to help in the "continued beautification of the Laboratory site using trees and shrubs, many of which were grown at Fermilab's own nursery. Please join us!"

Feynman Computing Center Host to Newest Physics Computing Devices

by Kevin A. Brown

Not too long ago, computing at Fermilab was characterized by giant, bulky hardware, cardboard cards punched full of holes, and noisy, troublesome machinery. Today, smaller, more reliable and sophisticated computers are in Fermilab's Feynman Computing Center. "So much has changed over the past five years," said Steve Ahlgrim (*Res. Div./Compt. Dept.*). "The complexity, integration, and management of different computer systems has become so complicated that if one system changes, probably so will other systems." The history of computing at Fermilab is the focus of this article, the second in a series of articles about the Feynman Computing Center.

Gerald Bellendir, (*Res. Div./Compt. Dept.*), noted that "We're embarking on a new computing era;

there is great anticipation about the forthcoming changes in the computer field." He cited a recent event that marked the end of an era at Fermilab. "A bit of history occurred on Saturday, February 11, 1989, when three of the four Cybers in Wilson Hall were hauled off to a salvager." Ahlgrim described the scene on that day. "We brought over a 10-story crane, pulled three Cyber 175's out of Wilson Hall's eighth-story windows, and put the Cybers on a truck in the parking lot. We had to use a crane because the 175's were too large for the elevators."

Past events in Fermilab's computing history are more difficult to recall. Jeff Mack, (*Res. Div./Compt. Dept.*), remembers that "17 years ago, the Computing Department's central computer consisted of DEC

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Coming to the Ramsey Auditorium. . .

Stephen Hawking to Lecture on "Black Holes and Their Children, Baby Universes"

"Where did the Universe come from? How and why did it begin? Will it come to an end, and if so, how?" Theorizing over views of the cosmos, the nature of time, and the Universe in which we live are the questions to which Stephen W. Hawking has devoted his life's work. Professor Hawking, "one of the most imaginative, influential thinkers of our age," discusses the vastness of space and time in his public talk, "Black Holes and Their Children, Baby Universes" at 8:00 p.m. Saturday, May 13, 1989, in Ramsey Auditorium.

Stephen Hawking has overcome the crippling effects of ALS (Lou Gehrig's or motor neuron disease) to tackle the most perplexing scientific theories of relativity, quantum mechanics, and a unified combination of the two. With the aid of a speech synthesizer attached to the arm of his wheelchair, Professor Hawking will discuss his pioneering research into black holes, which he describes as "a region of space-time from which nothing, not even light, can

escape, because gravity is so strong." It is from such theories that physicists hope to discover clues to lead them to the big bang, that moment in which the Universe was born.

Professor Hawking is the Lucasian Professor of Mathematics at Cambridge University, England, a post once held by Sir Isaac Newton. Although the author of many scholarly papers and books on the subject of theoretical physics, his first popular book about space and time, *A Brief History of Time, from the Big Bang to Black Holes*, has reached the top of the best-seller list. The perseverance with which Professor Hawking has pursued mankind's continuing quest for a complete description of the Universe in which we live is inspirational in its scope. He is truly "an extraordinary contributor to the ideas of humankind."

Admission to Fermilab Lecture Series events is \$2. As is customary at Fermilab's public lectures, a reception will follow the talk. Reserve your seat by calling ext. ARTS weekdays between 10:00 a.m. and 12:00 noon or 1:00 p.m. and 4:00 p.m. Phone reservations are held for five days awaiting payment.

- Tammey Kikta

Sotavento and David Hernandez & Street Sounds

¡Que te diviertas! Celebrate the colorful, Hispanic rhythms of sound and speech with Sotavento and David Hernandez & Street Sounds as they present the cultures of Latin America through music and verse on Saturday, May 6, 1989, at 8:00 p.m. in Ramsey Auditorium.

The six talented musicians comprising Sotavento hail from Chile, Mexico, Peru, Puerto Rico, and the United States. The variety of Latin-American musical styles they perform ranges from traditional folkloric, to the *Nueva Cancion* or "New Song" movement, to original compositions which synthesize traditional Latin, African, and European musical elements. Collectively, Sotavento plays more than 25 wind, string and percussion instruments, including such indigenous instruments as the Andean sikus, quena, quenacho, and charango; Venezuelan and Puerto Rican cuatros; Colombian tiple; the Mexican vihuela, tololoche and jarana; the guitar and guitar-

ron; and the percussion instruments bongos, bombo leguero, wuankara, marimba, maracas, claves, cabazas, chajchas, guiro, and afuches.

Chicago's unofficial poet laureat, David Hernandez, reminds us of the old bardic and troubador traditions as his "streetwise" poetry is accompanied by the vital musicians of Street Sounds. David Hernandez and Street Sounds have coalesced their diverse cultural backgrounds (Puerto Rican, Mexican, Afro-American, and Eastern European) into a compelling musical and theatrical experience. "Hernandez stirs fanciful imagery with almost prosaic storytelling; the resulting mixture is disarmingly and deceptively down-to-earth . . . The band is usually just right, except when it's even better than expected!" The band consists of bassist Mitchell Covic, guitarist Alejandro Velasco, and percussionist Alpha Omega Stewart.

Admission is \$8. Reserve seats by calling ext. ARTS weekdays between 10:00 a.m. and 12:00 noon, or 1:00 p.m. and 4:00 p.m. Phone reservations are held for five days; those not paid for within five working days will be released for sale. - T. Kikta

Marjorie Bardeen Named "Outstanding Woman Leader"

Public Service Recognition Week, to be celebrated at Fermilab and nationwide May 1-7, 1989, is a time set aside to pay tribute to the profession of public service and to the "unsung heroes and heroines" that make up the public workforce. The week is sponsored by Public Employees Roundtable and endorsed by the President's Council on Management Improvement.

Marge Bardeen, co-founder, Vice-President, and Program Director of Friends of Fermilab, has been named the Outstanding Woman Leader of DuPage County in Education by the West Suburban YWCA. She will be honored at the sixth annual "Outstanding Women Leaders Luncheon" on May 4th at The Carlisle in Lombard. *FermiNews* salutes this distinction as a part of Public Service Recognition Week.

Although she's been recognized for outstanding public service, her contributions to education began at home. For example, while living in California, she designed a game to help her third-grade son, Chuck, learn fractions at home. Chuck's teacher asked Bardeen to make copies of the game for the other students in the class. This grew into a larger project; for two years, she volunteered an hour every day to implement a fourth-grade individualized math program.

At Fermilab, her leadership skills in education are perhaps best illustrated by her work as Program Director of Friends of Fermilab. In this role, she has overseen the development of 23 programs in science and math. As a result of her efforts, more than 400 teachers have received graduate credit and a stipend for their work in these programs. Additionally, several thousand junior high students and their teachers have toured Fermilab and spent time in class with Fermilab scientists.

She is also the principal investigator on three National Science Foundation grants totaling more than \$1 million, and has helped organize and chairs a U.S. Department of Energy National Coordinating Committee on pre-college programs. She is a member of the U.S. Department of Education Title II National Steering Committee which advises the Department on math and science programs, and was moderator of the Illinois Mathematics and Science Academy Proposal Development Workshop.

In support of her nomination as Outstanding Woman Leader, Fermilab Director Leon Lederman wrote, "[Bardeen] has involved school administrators

and teachers in all facets of planning, development and conduct of education programs at Fermilab. . . If Ms. Bardeen has her way, and we have no doubt she will, national laboratories, including Fermilab, will have Science Education Centers that may become prominent resources for our schools across the nation."

She has contributed her talent for leadership in education in a number of other ways. Not only has she served as trustee for the College of DuPage since 1987, but she was also a member of the board of Glenbard High School District 87 from 1979-1985, and president of that board for the last five years of her tenure. Her election campaign in 1978 emphasized her desire to serve as an advocate for students and community members of the entire district, stressing quality education, equity for all parts of the district, and fiscal responsibility. In 1984, she earned the "Those Who Excel" award from the Illinois State Board of Education for her service on the school board.

The West Suburban YWCA selects eight women each year in one of the following categories: Arts and Cultural, Athletics, Business and Professional, Community Volunteer, Education, Government and Politics, Professional in Community Work, and Science and Medicine, and an additional award is presented for Special Recognition. In 1986, Arlene Lennox, Head of the Neutron Therapy Facility in the Accelerator Division, was named Outstanding Woman Leader in Science and Medicine. - K. A. Brown

National Science and Technology Week, National Consumer Week Observed

April 23-29 is National Science and Technology Week. In recognition of this occasion, so appropriate to Fermilab's endeavors, Director Leon Lederman has declared an official Laboratory observance. A proclamation to that effect from the Director is included with this issue of *FermiNews*.

April 23-29 is also National Consumer Week. Fermilab staff are encouraged to take advantage of the Activities Office's money-saving coupons for recreational activities.

Average number of points a student gains on the math section of the SAT per 100 hours of preparatory classes: **39** - from *Harper's Index*

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Returning the CapTree to its original condition required more than a simple root feeding. Lockwood commended Jim Hogan (*Accel. Div./Mech. Suppt.*), Warner’s supervisor, for volunteering his Department for the challenging project. As project leader, Warner spent the last year coming up with ideas on how to refoliate the tree. “I worked with [Fermilab Artist] Angela Gonzales at the beginning of the project, and we went over a few preliminary ideas on what to do with the CapTree. We gave those ideas to Dr. Wilson, but he wanted the original capacitors on the tree because they were a part of his design.”

Unfortunately, the original capacitors were contaminated and unusable, and new capacitors would be too expensive. Therefore, the best solution was to simulate the original capacitors. Explained Warner, “We considered several options. One inexpensive option was to use painted wood blocks, but those wouldn’t weather very well.” Eventually, Warner came up with the fiberglass box idea, which was the best option because fiberglass boxes would be relatively inexpensive, durable, and best resemble the original capacitors.

The fiberglass boxes are coated with orange polyurethane paint with UV inhibitors. “It’s the kind of coating found on truck bodies and sailboats - it really weathers very well,” Warner said. In addition to matching the color of the original capacitors, the new orange “foliage” gives the CapTree an almost perpetual autumnal appearance.

Mounting the fiberglass boxes on the CapTree was hard work. Without capacitors, the CapTree was covered with 860 holes, and the threads in the holes had corroded. To eliminate the corrosion, Jeff Meisner (*Accel. Div./Mech. Suppt.*) and Bob Slazyk (*Accel. Div./Mech. Suppt.*) had to squirt WD-40 into each of the holes. Then, to mount the sealed boxes, Warner, Slazyk, and Meisner borrowed a bucket truck from the “plant” maintenance people at Site 38. “I got up in the bucket truck and hung a number of the boxes just to get my hands dirty,” said Warner, “but Meisner and Slazyk did the hard work.”

Sounding like a horticulturist who had nurtured a hybrid rose, Warner said, “It has been an interesting project. At first, it was a real challenge, but in the end, it worked without a hitch.” - **K. A. Brown**

Average cost per square foot to dig a wine cave in California: \$50 - from *Harper’s Index*

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(Digital Equipment Corporation) PDP 10 systems and a handful of people in a humble portakamp near the Meson beamline. Eventually, we changed from PDP 10 as our central computer to the Cyber computing systems, and that was the beginning of our offline computing work done in a Control Data environment.”

The first Control Data computer at Fermilab was a Cyber 6600 series, a large, slow, but state-of-the-art machine for that time. In the late ’70s, the Lab replaced the 6600 series with Cyber 175 200-series machines. They were about equal to 24 VAX 780s in power. A few years later, Fermilab acquired a Cyber 875. In the meantime, DEC developed the VAX system and the PDP staff moved to the new VAX. “That was a big turning point for the Lab, and we’re still seeing the results of the VAX architecture within the Laboratory and around the world today,” Mack said.

More recently, the 1980s marked the rapid development of new computing systems at Fermilab. Early in the decade, the Computing Department recognized that the computing power of existing mainframes was inadequate. According to Charles (Chip) Kaliher, ACP (Advanced Computer Program) System Manager, “the price to buy computing power from mainframe computing engines on the market at that time was out of reach, compared to the amount of data that the Lab had to analyze.” In response, the ACP group, headed by Tom Nash, was formed and charged with developing or finding a cost-effective solution that would allow the Lab to process data. The result of the group’s efforts is the ACP system.

In addition to the ACP, the Lab required a more general purpose scientific computer. “Even before the new building was built, we knew that the VAX and the ACP’s would incompletely meet our needs and that we had to find yet another high-performance computing engine,” Bellendir said. The Department, guided by past Department Head Al Brenner and current Department Head Jeffrey Appel, launched an effort to acquire a new system. The Department’s efforts culminated with the purchase of the Amdahl, which was installed in the unfinished Feynman Computing Center in May 1988. Fermilab has a number of experiments running on the first half of the Amdahl system, which is currently operating 24 hours a day, 7 days a week. **Continued on page 5**

In the Library

- The Library has the 1988 edition of the Thomas Register, a 21-volume set listing U.S. manufacturers and their products and services. Manufacturers and products can also be searched on the SPIRES database, HITECH.

- Free Computer Searches of physics-related literature are offered by the Library. The results of these searches can be forwarded to your FNAL VAX account.

- University of Chicago Library online catalog is available via dial-up access.

- Fermilab Library new-books list is available on the VAX Cluster:

\$help newbooks

\$setup newbooks

\$type/page newbooks

- **Missing, Please Return:** IEEE Transactions on Nuclear Science, Vol. 32, #4-5, part 1, 1985. This bound journal volume covers the first part of the IEEE Particle Accelerator Conference.

For information contact the Library, WH3X, FNAL::LIBRARY, ext. 3401. - Paula Garrett

The Film Society Presents:

Housekeeping. Friday, April 28 at 8:00 p.m. in Ramsey Auditorium. For two orphaned sisters, life with Aunt Sylvie (Christine Lahti) is unpredictable, but exciting. Bill Forsythe directs a "funny and haunting film about people on the fringe of society."

My Life as a Dog. Friday, May 12 at 8:00 p.m. in Ramsey Auditorium. A film about 12-year-old Ingemar, who endures a series of "horrifyingly funny disasters while growing up in Sweden in the late 1950s."

Admission to both films is \$2.00 for adults, \$.50 for children.

Percentage of Americans who like dogs on TV commercials because they are "more exciting than people": 23 - *Harper's Index*

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As with past computing systems, Fermilab's new systems share the same mission: high-energy physics analysis. The key to successfully completing this mission is an ideal home: The Feynman Computing Center. In the new Center, "We have space for these systems to grow and we have better contact with the hardware," said Mack. Kaliher added that the new center meets space and design needs of the ACP system. "In Wilson Hall, the ACP's were newcomers in already limited space. We were wedged into one little corner on the seventh floor computer room. But since the move to the new building, we've added to the new system, and we can now organize and maintain the ACP's more effectively."

The challenge now facing the Computing Department is to make all of these systems not only work well by themselves, but to connect them in such a way that users can easily move about the different systems. Fortunately, the Department and Users have enough space in the Feynman Computing Center to build upon a successful past of high-energy physics computing at Fermilab.

Benefits Notes

Voluntary Retirement Accounts' Performance

A comparison of investment performances through 1988 of TIAA-CREF regular annuity (RA), TIAA-CREF supplemental annuity (SRA), T. Rowe Price, Dreyfus, and Fidelity supplemental retirement accounts is available from the Benefits Office. The past performance illustrations compare the supplemental accounts over 1-, 2-, 3-, 5-, and 10-year periods. For a copy of these illustrations, call exts. 3395, 4362, or 4361. - Paula Cashin

"Around the Laboratories"

From *Federal Computer Week*:

Love in the Lab

Most of the Energy Department's national Laboratories publish internal newsletters for their employees. Not surprisingly, they are replete with news of heavy-duty technological what-nots. . .

But the latest "Bulletin from Brookhaven National Laboratory," out just in time for Valentine's Day, had this very low-tech notice in the classified section: "Smoo gly Woogums, Pookey - I love you. You are my best friend."

(Submitted to *FermiNews* by Barbara Edmonson)

Stockrooms to Close for Inventory

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

Wilson Hall Catacombs Stockroom: closed Friday, May 19, at 12:00 noon. Will re-open Monday, May 22, at 12:30 p.m.

Site 38 Stockroom: closed Monday, May 22, and Tuesday, May 23, all day, both days.

Please plan accordingly. For questions or problems, call ext. 3808, the Supply Office.

Frank's Place: New Stockroom Items

Line driver, asynchronous multipoint, for terminal to port selector connections, 115 VAC, Micom P/N M400 MP or equal. #1411-0500.

Label, address, for plain paper copiers, self-adhesive, Avery P/N 5351, 100 sheets/box, 1" x 2-3/4", 33 labels per sheet. #1340-0650.

Label, address, for plain paper copiers, self-adhesive, Avery P/N 5360, 100 sheets/box, 1-1/2" x 2-13/16", 21 labels per sheet. #1340-0655.

Label, address, for plain paper copiers, self-adhesive, Avery P/N 5352, 100 sheets/box, 2" x 4-1/4", 10 labels per sheet. #1340-0660.

Label, address, for laser printer, self-adhesive, Avery P/N 5160, 100 sheets/box, 2-5/8" x 1", 30 labels per sheet. #1340-0670.

Label, address, for laser printer, self-adhesive, Avery P/N 5163, 100 sheets/box, 2" x 4", 10 labels per sheet. #1340-0675.

Transparency marking pens, set of eight pens, black, blue, brown, green, orange, purple, red, yellow, super-fine point, non-permanent. #1315-1170.

Transparency marking pens, set of eight pens, black, blue, brown, green, orange, purple, red, yellow, fine point, permanent. #1315-1185.

Transparency marking pens, set of eight pens, black, blue, brown, green, orange, purple, red, yellow, fine point, non-permanent. #1315-1180.

Film, camera, color, Polaroid Spectra System instant color film, Polaroid P/N 610020, 10 pictures, 10 x 10 cm. 2560-0855.

Price of a gallon of Canine Quencher, a bottled water for dogs: **\$.99**

Brands of bottled water sold in the U.S.: **535**

Price of a 5-minute collagen injection to fatten lips: **\$300** - *Harper's Index*

FermiNews Cla\$\$ified Ad\$

FOR SALE

Miscellaneous:

ANTIQUA DINING ROOM SET, walnut table 40" x 46" w/ 12" leaf, 6 chairs & buffet. Call David 859-0135.

DIGITAL CD PLAYER (Technics), two years old, good condition. \$150 or best offer. Call Dave 213-3830.

COMPUTER: PC-AT compatible, Advanced Logic Research (ALR) 80286, "Dart 12.5 model 30" with floor pedestal. Selectable 9 and 12.5 Mhz operation. 512 Kbyte memory (motherboard will hold full 2 megabyte). Two 8-bit, six 16-bit slots. "Phoenix" Bios, fully "OS/2" compatible. One 1.2 Mbyte floppy, one 30 Mbyte RLL hard drive. Dual hard/floppy controller will handle one additional floppy and one additional hard drive. Hercules compatible graphics card, Hi-res amber monitor. 101 key enhanced keyboard, one serial port, two parallel ports. An ALR dealer is located in Batavia. Complete system: \$1700. Call Ray at x3671 or at 837-6989.

Real Estate:

LYNBROOK PARK-MODEL TRAILER - 35' long x 13' wide on 45' x 100' wooded lot in Seneca. Has A/C, heating, sleeps 6. Lot facilities include trees, lawn, city water, sewer. Recreation includes 2 pools, horseback riding, club house and much more. \$24,000. Call Sandy at ext. 3808 or 741-1321.

TWO-BEDROOM CONDO, in beautiful "nature setting" overlooking the DuPage River in Emerald Green. W-T-W carpeting, Bruce hardwood floor in eat-in-kitchen, fireplace, garage, plus lots of extras. \$89,000. 393-2012.

HOUSE, Randall Square subdivision in Geneva, one year old, three bedrooms, 2-1/2 baths, two-story, full basement, two-car garage, good school district, much more. \$152,000. Call 208-1523

Motorized Vehicles:

1977 GRAN PRIX V8 SEDAN, 133 K miles. \$800 maybe... Call Lester Wahl at ext. 4814.

1978 FORD MUSTANG II, 2.3L, 4 cyl., 4 spd., power steering, disc brakes, radio, good condition. \$590. Call Sandy at ext. 3808.

1980 TOYOTA, AM/FM radio, 5-speed, new clutch, very reliable. \$850 or best offer. Call Michael at ext. 3721 or 406-9227.

1986 MUSTANG LX HATCHBACK w/V6 engine, auto trans, factory T-tops, A/C, premium factory ster./cass., all power incl. windows and locks, tilt wheel, cruise control, alarm, rust-proofed, new brakes, tires, and wire wheels, transferable warranty, extra clean, white. \$7295. Call ext. 3281, 312-355-7075 evenings and weekends.

1982 KAWASAKI, 750 LT., bought new in 1985. Fairing, backrest. Still new with only 3100 miles. \$1400. Call 312-844-2160.

1987 NISSAN SENTRA STATION WAGON, five-door GXE, 26,000 miles, excellent condition. \$6800. Call 208-1523.