

Fermi news

FERMI NATIONAL ACCELERATOR LABORATORY

Fermilab and SSCL mark technology milestone

Fermilab Director John Peoples and SSCL Laboratory Director Roy Schwitters held the first public display of industry-assembled prototypes of superconducting magnets that will be the heart of the SSC particle accelerator. The event, which took place at Fermilab on February 5, marked an important milestone in a very successful, large-scale technology transfer project between the national laboratories and private industry.

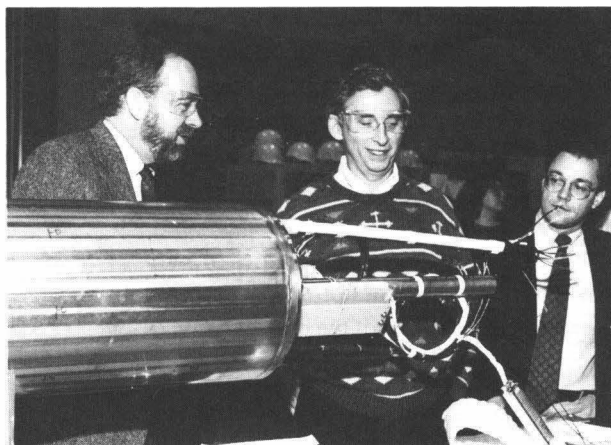
"American industry has clearly demonstrated its competence to build the sophisticated magnets required for the Super Collider," said Schwitters.

The 50-mm dipole (bending) magnets displayed were assembled by General Dynamics Corporation using Fermilab tooling. Other dipole magnets of a slightly different configuration have been assembled by Westinghouse Corporation working at Brookhaven National Laboratory. Both magnet designs have been tested and went well above the design current of 6500 amperes.

John Peoples and Roy Schwitters described the successful test of the superconducting dipole magnets as proof of the significant progress the nation's industrial community is making in preparing for construction of the Super Collider particle accelerator. "Long before the site was picked, it was recognized that these superconducting magnets were the key technical element of the Collider," said Schwitters.

General Dynamics will now build seven dipoles at Fermilab, and Westinghouse will build five at Brookhaven. Of these twelve magnets, five will be used later this year in the string test at the SSC Laboratory. Ultimately 8,600 of these magnets will be manufactured for the SSC.

Fermilab was the world's first high energy physics laboratory to use superconducting magnets in designing and building an accelerator. "Fermilab's pioneer-



l to r Roy Schwitters (SSCL), John Peoples (Fermilab) and Mike Packer (General Dynamics) examine a magnet being manufactured at Fermilab by General Dynamics.

ing development of the technology has been an essential step in building ever more powerful particle accelerators," said John Peoples. There are, however, many design and engineering differences between the Tevatron magnets and the new 50-mm dipoles produced here. The conductor developed for the SSC carries about 1.5 times more current than the Tevatron and the field is about 1.5 times higher than the Tevatron.

The manufacturing standards were also different. "The Tevatron had good quality assurance, but the quality assurance effort for the SSC project was much more stringent," said Peoples. According to Schwitters the magnets are, in a sense, like old-fashioned Christmas tree lights. If one goes out, the whole strand goes out. "We had to place tremendous requirements on reliability and quality assurance," said Schwitters. "I think we are reaching new ground in quality assurance and engineering. It has been a big success for this team."

"Few of us understand just how extraordinary the performance of these first few magnets have been," said Joseph Cipriano, DOE/SSC Project Director. "We see the beginnings of what we think will be a very successful technology transfer to industry *Technology milestone continued on page 2*

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Fermi news is published by the Fermilab Publications Office, MS 107, P.O. Box 500 Batavia, IL 60510 708 840-3278 FNAL::TECHPUBS

The deadline for the Friday, March 6 issue of *Fermi news* is Wednesday, February 26. Please send your article submissions or ideas to the Publications Office.

Fermilab is operated by Universities Research Association, Inc. under contract with the U.S. Department of Energy.



Gale Pewitt cited by DOE



l to r Joseph Cipriano and Gale Pewitt

At the February 5 media briefing at Fermilab, Gale Pewitt (TS/Project Manager) was presented a United States Department of Energy Certificate of Appreciation. The certificate was presented to Pewitt by Joseph Cipriano, DOE/SSC Project Office and was signed by DOE Energy Research Director William Happer.

The citation presented to Pewitt stated: "Dr. Pewitt has developed and led a strongly focused team involving General Dynamics Corporation, the SSC Laboratory and Fermilab to the successful design, production and test of 50-mm Collider Dipole Magnets for the Accelerator Systems String Test. His personal initiative and resourcefulness were the foundation for achieving this milestone so critical to the construction of the Super Collider."

Pewitt's acceptance of this honor was very brief, but summed up his feelings re-
Pewitt continued on page 4

Technology milestone

continued from page 1

from the expertise that has been developed here at Fermilab and at Brookhaven."

According to Tom Bush, Associate Director of the SSC and Head of the Magnet Systems Division, one of the most extraordinary parts of the project was "the mesh of organizations we had to pull together which included: industry—who truly hadn't done this kind of thing; a brand new Laboratory down south—who was struggling to put together its own organization; and Fermilab—who invented the technology." "This meshing together of industry and the national laboratories was probably the most successful part of the project," said Bush.



Members of the media take note as Peter Mazur (TS/Mag Dev & Test) discusses magnet technology.

Environmental protection and waste management at Fermilab

Protection of the environment has become an important priority for modern society worldwide because it has become clear that our planet is, indeed, "Spaceship Earth." This is a marked departure from previous generations who, throughout history, thought that by throwing their trash "away," it was no longer their problem. It has now become clear that there is no such place as "away." All people have to become involved with protection of the environment. In response to this need, both the federal and state governments have passed a number of laws and implemented detailed regulations—virtually all of which apply to Fermilab. Much of this has been done through the United States Environmental Protection Agency (EPA) and the Illinois Environmental Protection Agency (IEPA).

In a two part series, ES&H Section Head Don Cossairt will briefly summarize the major environmental protection laws and their immediate impact on Fermilab.

NEPA refers to the National Environmental Policy Act. This federal law requires all actions (including all activities of Fermilab) of the federal government to be reviewed for their impact on the environment. Since 1990 all activities of the Laboratory are reviewed by the divisions and sections at the purchase requisition level. DOE has determined that certain of its activities are

automatically "ok" from the standpoint of NEPA while others require review by DOE. After the initial screening at the division/section level, the items which require DOE review are submitted to the ES&H Section where the formal submittals to DOE are prepared. The divisions and sections of the Laboratory have chosen to make their review of purchase requisitions also to include a screening for items which could be detrimental to environment, safety and health above and beyond those specifically required by this federal law.

The Clean Water Act (CWA) is a law which protects the waterways of our nation. It regulates water quality by imposing limits on materials which may be discharged to surface waters through waste disposal or stormwater runoff. Fermilab is currently systematically reviewing its discharges to improve our compliance with this law. **The Safe Drinking Water Act (SDWA)** sets standards for public drinking water systems. Even though the law is aimed at communities, the Facility Engineering Services Section operates the drinking water systems in compliance with it. It is very important that the drinking water system not be connected to other water systems such as the industrial cooling water or low conductivity water systems. The Laboratory will soon institute a formal policy designed to preclude such connections occurring by accident. *Part II-Hazardous Waste Acts will appear in the March 6 issue of Ferminews.*

tiger team REPORT

February 21, 1992 Vol. 1, No. 1

It's official—theTigers are coming!

The Tiger Team is coming and the official kickoff is scheduled for Monday, May 11, 1992.

The Tiger Team will arrive with a squad of approximately 30 technical experts from DOE and private firms under the leadership of Harry Season, DOE, Albuquerque Field Office and Deputy Leader Timothy Pflaum, DOE, Headquarters. They will take on the home team, Fermilab, which is over 2,000 strong and ready to flex its ES&H muscle.

The upcoming Tiger Team assessment is part of Secretary of Energy James D. Watkins' 10-point Initiative issued in 1989, to strengthen the Department's environment protection and waste management activities. Fermilab will be one of the last DOE-funded facility to receive a first-round Tiger Team review.

The Tiger Team will perform a comprehensive assessment of environment, safety and health pro-

grams and their management at Fermilab. Included in this review will be: in the areas of environmental protection, the Tigers will assess compliance with regulations related to the storage and handling of radioactive and hazardous materials, the disposal of waste, and the monitoring of air, water, and soil and effluent discharge.

In the area of safety and health, there will be an examination of fire and radiation protection programs, medical services, emergency planning activities and compliance with requirements of the Occupational Safety and Health Administration. The ES&H organization, planning, training and staffing policies at Fermilab will also be reviewed.

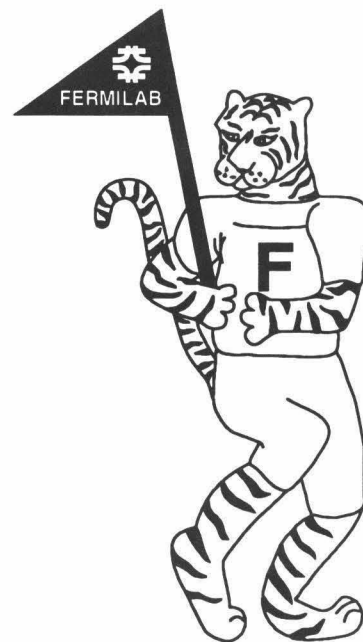
The administrative headquarters for the Tigers, during their nearly six-week review of
Continued on page 2

chalk talk

Everyone's cooperation is needed over the next few weeks to prepare for the upcoming Tiger Team assessment. This review, however, is not designed to be an episodic activity, but an on-going opportunity to move our Laboratory into a new era of ES&H awareness and responsibility.

When Admiral Watkins announced his 10-Point Initiative—designed to “chart a new course for the Department toward full accountability in the areas of environment, safety and health”—he established that ES&H objectives took precedence over production or research objectives. “At Fermilab we strongly adhere to these priorities,” said Director John Peoples. “The way in which we conduct our research must never compromise the environment or the safety and health of those who work at this Laboratory.”

It is now time for all of us to take stock of our own personal levels of awareness and compliance to ES&H practices and policies. If you have questions or concerns, please discuss them with your supervisor or your division/section safety officer.



The *Tiger Team Report* is published by the Fermilab Publications Office, MS 107, P.O. Box 500, Batavia, Illinois 60510 (708) 840-3278
FNAL::TECHPUBS
C. Crego, editor
E. Gonzalez, assistant editor
S. Hanson, circulation

Fermilab is operated by Universities Research Association, Inc. under contract with the U.S. Department of Energy

team schedule

- February 20-21:
Technical Safety
Appraisal Team Leader
Reconnaissance Visit
- May 11:
Tiger Team Assessment
Begins
- June 8:
Tiger Team Assessment
Final Closeout

Watch for the next issue of the Tiger Team Report, for the latest Tiger news as it happens.

the cheering section

Noteworthy practices cited

As part of their assessment, the Tigers will review site activities for any noteworthy practices, activities or programs that have general application to DOE facilities and warrant documentation for the purpose of information transfer. A practice is considered noteworthy if its design and/or execution successfully addresses activities that have frequently resulted in compliance problems at other facilities.

According to the *Tiger Team Guidance Manual* "the purpose of this activity is for information transfer and problem solving across the DOE complex." It provides the opportunity to identify innovative and cost-efficient solutions to common problems. *If you are aware of practices in your area that may be considered "noteworthy," please send this information to Bruce Chrisman, MS 105.*

It's official cont. from page 1

the Laboratory, will be located in Wilson Hall 8W, the current home of the Education Department offices.

The Tiger Team assessment will end with a closeout meeting scheduled for Thursday, June 11, 1992. Following their visit, the Tiger Team will prepare a formal report of its assessment which, after review and approval by Admiral Watkins, will be made available for public review. In addition, a corrective action plan will be prepared to address any Tiger Team findings. ■

Tiger Team Report

the scouting report

They aren't paper tigers

The Tiger Team assessment is serious business which should not be taken lightly. The results of Tiger Teams findings have halted construction projects, shut down waste handling facilities and closed a reactor. Tiger Teams have mandated changes costing \$80 million dollars and up at several laboratories. Funding for these necessary changes could affect dollars available for research.

—but they do like paper

It cannot be stressed enough the importance of ES&H and Quality Assurance documentation. The following are two tales from past reviews.

Example 1: A subcontractor was cutting a copper pipe over his head with a power saw and was not wearing eye protection. When questioned by a Tiger, the subcontractor said he was never told to

from the sidelines

DOE plans TSA and TTA . . .

or you can't tell the CUAs (commonly used acronyms) without a program

Becoming familiar with acronyms seems to be an ever increasing part of our existence at Fermilab and the upcoming Tiger Team assessment (TTA) of our Environment, Safety and Health (ES&H) program is sure to test our acronymese to its limits.

We have already become familiar with NEPA, EPA, IEPA, OSHA and CWA—not to mention the QA program's FIQAP and SQIPs. Now introducing the newest acronym on the block—the TSA.

TSA is a technical safety appraisal. This appraisal takes place concurrent and in conjunction with the Tiger Team assessment (hereafter known as the TTA).

wear such protection. The Tiger's escort objected, and by the next day had obtained the subcontractor's training records which showed he had received and signed for the appropriate training. This incident could have been used to cause trouble, but the Tiger accepted the paper and was satisfied that the subcontractor was acting on his own and that this one incident did not show that the laboratory's management of safety was lacking.

Example 2: One laboratory reviewed had no documented formal training for their accelerator operators. After some thought, the head of the department gave the operators a form on which they wrote down their qualifications to be operators: number of years of experience, etc. These forms were then signed by a crew chief and the head of operations, who attested to the veracity of these qualifications. The Tigers accepted this and were satisfied. Question: Were the operators any more qualified after the signature? Of course not. But, the existence of the paper showed the Tiger that at least someone had thought about what it takes to qualify as an accelerator operator. —*This scouting report was provided by David Finley (Accelerator Division).* ■

Tiger Teams are composed of three subteams: the management subteam, the environmental subteam, and the safety and health subteam. The safety and health subteam performs the TSA.

The TSA component of the Tiger Team has scheduled a reconnaissance visit to Fermilab on February 20-21. It is routine for the TSA team leader to visit a site about 10 weeks prior to the initiation of the actual appraisal. This visit is necessary because the TSA team members are selected after this initial visit to ensure that they possess the necessary expertise and credentials to perform a meaningful appraisal of the specific programs, projects and operations. During the February visit, the team leader ascertains the technical areas requiring appraisal, the special skills required of the TSA team members, and the number of team members required for each technical area.

The TSA reconnaissance visit will be a low key visit, consisting of a site tour and a general discussion about the facility with key staff. There will be no formal briefings. ■

New technology attracts attention

How do magnet technicians measure the magnetic field alignment of a 52-foot long Superconducting Super Collider (SSC) magnet when its interior pipe diameter is only 50 mm? Not very easily they say. One way is to use the pack-the-cannon approach where two technicians manually push a small diameter electronic gauge through the pipe three inches at a time, usually over the course of an entire work day. Although tried and true, this way is also admittedly time-consuming and laborious.

With a new technique minted at Fermilab and recently complemented with patent filing awards from General Dynamics, the once labor-intensive task could become a thing of the past. The technique uses a design built by the collaboration of William Boroski (TS/Engineering), William McCaw (TS/Engineering), Roger Zink of the SSC and Stephen Pidcoe of General Dynamics. It is the first self-propelled in-tube shuttle—or SPITS—and could bring magnetic field alignment into the age of remote, computer control.

Conventional techniques required at least two technicians to manually push a gauge through the beam tube with a series of very long aluminum rods. Every three inches, they are stopped to record magnetic field measurements. Gauge location was controlled through graduation marks on the push rods. Field measurements were then recorded, and the task was repeated from the other side to rule out calibration error.

Overall, the entire process took eight hours to complete. But the extensive time it took to measure a magnet's field alignment had not been considered until Stephen Pidcoe, with his background in automation and robotics, assessed the situation. Pidcoe, here at Fermilab on a six-month Industrial Fellowship, saw a way of improving the productivity of SSC magnet fabrication. To do this, he concentrated on automating the field measurement step of the magnet production process.

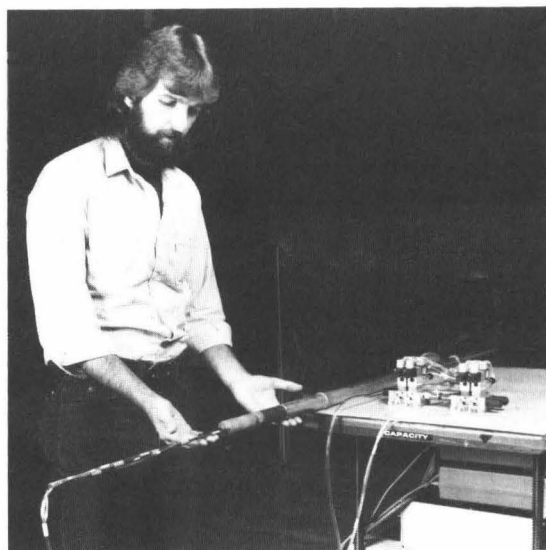
Recognizing that the conventional method was too slow to be used in mass production, the team began searching for a way to automate the process. With Pidcoe supplying the concept for a computer-controlled automatic device, Bill McCaw created the first working model of the SPITS, completing a scale version of the design that "performed very well,"

McCaw said. The next hurdle for the team to overcome was to build a working prototype, and in 12 weeks they had achieved their goal. They had completed the SPITS.

The result was a unique integration of mechanics and software that enables magnetic field data to be collected remotely. The key component of the automated system is the SPITS transport device itself. With the alignment gauge riding at the head, two expandable cuffs are positioned at either side of a retractable piston. When gas is pumped into or out of a particular cuff, the piston expands, relocating the alignment gauge ahead three inches where it can take another reading. Overall, the SPITS glides through the pipe as nimbly as a bobsledder coarses through the chute—a requirement imposed by the delicacy of the magnetic field alignment gauge. A computer manipulates the inflatable cuffs through four solenoid-controlled air valves, allowing them to be sequentially pressurized and depressurized to move the SPITS in a manner that resembles an inchworm. McCaw nicknamed the device the "creepy crawler."

At the finish line, the first prototype took an average of 56 minutes to travel the length of one beam pipe, a noticeable improvement over the manual time of eight hours. The SPITS looked so promising that General Dynamics filed for a patent on it in October of 1991. For their work, Pidcoe, Zink, Boroski and McCaw each recently received cash awards from General Dynamics. By virtue of its potential as a labor-saving tool, the patent application filed by General Dynamics carries the message that a major corporation has enough confidence in the device to sponsor it through the patent process.

But the story isn't one strictly of technological triumph. It is the story of teamwork; of a successful joint collaboration between Fermilab and industry as measured by an efficient, collective effort. The SPITS took just three months to design



Bill Boroski inserts the SPITS into a mock beam tube. The SPITS recently earned the members of the magnet collaboration patent filing awards for its innovative design.

and build. Pidcoe, now back at General Dynamics in San Diego, attributes the quick turnaround to the atmosphere at Fermilab. "It was a great mix of academic and practical practices," Pidcoe said.

Though work on control system improvements and toughening up the basic shuttle has kept the SPITS from being used as it was originally envisioned, there are possible future applications for the device. One scenario has the SPITS carrying a laser target through the Fermilab magnets to sight the beam position, Boroski said.

It is also possible that a working SPITS could see action sometime in the near future when a total of 8,600 magnet technology

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Benefit notes

TIAA-CREF retirement annuities

On January 1, 1992 TIAA-CREF changed the conditions under which they will "repurchase" retirement annuities. Under the old repurchase provision you could receive the full value of your retirement annuities, if all your retirement annuities' issue dates were less than 5 years old, and you were not employed by another TIAA-CREF institution.

Under the new repurchase provision you can receive the full value of your retirement annuities, if the TIAA Retirement Annuity accumulation is under \$2,000, the total TIAA-CREF Retirement Amenities accumulation is under \$4,000, and you do not have a TIAA Transfer Payout Annuity (TPA) in force. **The new conditions apply to employees who became participants in the Fermilab pension plan on or after January 1, 1992.**

For further information on this or other benefit changes, contact the Benefits Office, x3395.

Fermilab past, Fermilab present, Fermilab yet to come . . .

Laboratory directors past and present convened for the Fermilab portion of the American Association for the Advancement of Science's (AAAS) annual meeting held February 6 through 11 at the Chicago Hyatt Regency hotel. The six-day event, hosted by the world's largest general scientific organization, brought together everyone from astrologers to zoologists for nearly 200 symposia and 40 topical lectures.

Before the Lab's founding and current fathers gathered for their historic session, media attention focused on high energy physics at a news briefing hosted by Chris Quigg (RD/Theo physics) and John Huth (RD/Col Det Dept). The hot ticket item to the science writers gathered at the briefing was the top quark search about to begin with the April 1 startup of the 1992 Fermilab collider run. Huth enticed the particle-hungry press by hinting that the contest nature of the competing CDF/DØ collaborations could lead the top's finder to some type of (Nobel ?) prize.

A group of more than 40 AAAS members and representatives of the media, who couldn't wait for the collider run to begin, got a leg up on their competition assembled at the news briefing downtown by opting for a tour of Fermilab with Stephen Parke (RD/Theo Physics), Nancy Lanning (LS/Public Information) and Barbara Lach (LS/Public Information). After an introduction to the Laboratory by Parke, the groups toured Wilson Hall where they explored the 15th floor exhibit area. Then it was off to CDF and DØ where volunteer experimenters gave a short primer on detector hardware and tracking systems to the eager audience.

Back in Chicago, the afternoon session organized by Quigg, *Particle Physics on the Prairie*, brought together four generations of Fermilab pioneers for a historical overview celebrating 25 years of forefront physics. Norman Ramsey, former Universities Research Association president and often referred to as the "pre-director" of Fermilab, took the audience on a voyage back in time to the origin of the 200 BeV accelerator. The creation of Fermilab, then the National Accelerator Laboratory, had implications that spanned governmental agencies,

state legislatures and even involved President Lyndon Johnson, Ramsey remembered, but after intense and prolonged debate the Atomic Energy Commission finally sited Fermilab in Illinois.

Robert Wilson, Fermilab's first director, recalled the creation of Fermilab from its start on the 10th floor of the Executive Plaza office building in Oak Brook to the point of the first high energy physics collaboration between the United States and the Soviet Union. Robert Wilson became the National Accelerator Laboratory's first director in March of 1967, but as he recalled, "The job wasn't to build an accelerator, it was to build a laboratory. The scientists would need us to get the accelerator built, but we would need them even more so."

Fermilab's second director and AAAS president, Leon Lederman, traced the evolution of the Fermilab accelerator into the Tevatron—the project completed during his tenure. The science and technology produced in building the Tevatron contributed greatly toward the development of the superconducting industry and the widespread implementation of magnetic resonance imaging devices (MRIs) in hospitals.

Wrapping up the succession of Fermilab directors was current director John Peoples who looked ahead to Fermilab at the millennium. The technology developed through the Tevatron continues to contribute to the design of accelerators, most notably in the form of prototype magnets built for the Superconducting Super Collider (SSC) at Fermilab, Peoples explained. The soon-to-be-built Fermilab Main Injector will increase the collision frequency of the Tevatron, enabling young physicists to study elementary particles more closely while preparing them for research at the SSC. Fermilab's role in the physics community is as important today as it has ever been, and the Laboratory will continue to be a scientific leader well into the 21st century, Peoples predicted.

This year's Chicago meeting was the 158th for the AAAS. The first Chicago meeting of the AAAS was in August of 1868 and was the association's 16th national meeting. The 1993 meeting will take place in Boston, Massachusetts.—*Brian Dick*

Pewitt continued from page 2

garding the success of this project. "Let me just say, there were a lot of people at Fermilab—the team—that did this."

Fermilab represented by 17 runners in the Chicago Marathon

Seventeen runners from Fermilab competed in the Chicago Marathon on October 27, 1991. The Fermilab team, the largest corporate team at the event, was sponsored by the Recreation Office and organized by Steve Conlon (AD/Booster). In addition to the marathon runners, three Fermilab runners competed in the 5K race which was held simultaneously. This was the first year that an organized Fermilab team participated.

Of the 8,000 plus runners in the marathon, the Fermilab contingent, wearing "Fermilab Accelerators" racing shirts, established themselves in the pack. An hour or so after the fastest, most elite runners had finished, the Fermilab team members began to cross the finish line. They trickled in for several hours with everyone finishing the race. The runners said that the effort needed to finish the marathon was roughly proportional to how long they were out on the course.

Everyone put forth a good effort and some are even planning to run again (even faster) next year...maybe!



Pictured in the team photo are (l to r):

Ian Manning (DØ), Elizabeth Gonzalez (LS/Publications), Harrison Prosper (DØ), Rodolfo Gonzalez (AD/Instr.), Mark Schmitz (CDF), Steve Conlon (AD/Booster), Jim Schultz (LS/VMS), Don Shea (NTF), Chip Stewart (DØ), Salah Chaurize (MCR), Todd Sullivan (MCR), Pat Colestock (MCR), and Joe Longo (AD/Operations). Not pictured are: Rich Astur (DØ), Eric Balhazar (CD), Steve Chappa (RD/EE), Dave Gerdes (CDF), Nancy Grossman (DØ), Kaori Maeshima (CDF) and Tony Jackson (MCR). Photo taken by Roger Dixon (DØ).

Public Science Day a smash

Almost 600 students from West Chicago's Gary Elementary School got a firsthand look into the world of science when they traveled to Fermilab for Public Science Day on February 6. The event marked the kickoff of Gary's recently established partnership with Fermilab which aims to encourage lifelong interest in science.

While at the Lab, the children participated in hands-on science activities, visited over lunch with scientists and engineers and attended the *Weird Science* instructional show.

"The day was a great success due in large part to the many Fermilab employees and users who assisted with the event," said Dave Abler, coordinator of Fermilab's Public Science Day. They included: Ken Stanfield, Kent Collins and staff, Jean Lemke, Susan Grommes, Gary Verseput and staff, Brian Dick, Fred Ullrich, Reidar Hahn, Jim Shultz, Peggy McAuliff and staff, Pierrick Hanlet, Tom LeCompte, Carlos Hojvat, Gaston Gutierrez, Antonio Morelos, Tim Dubbs, Christina Etchegoyen, Lenny Speigel, Mike Urso, Ed Kuns, Oscar Trevizo, Marcelo Lopez, Robin Dombeck, Karen Smith and Gayle Stephens.



Gaston Gutierrez (RD/Facil Dept) shares lunch time conversation with children from Gary Elementary school during Public Science Day.

New technology continued from page 3

nets are scheduled to be built for the SSC.

Fifty-six minutes of travel time for the SPITS clearly offers a marked improvement over the conventional technique, especially when magnetic field alignments are required in the thousands. Boroski agrees: "There's a definite need for it."—Brian Dick



Notice to Employees

As announced in President Bush's State of the Union Address, the IRS has released new withholding tables for wages paid after February 1992. According to the IRS, the new tables compensate for the fact that many taxpayers are overwithheld and have to wait until after they file their tax returns to get a refund. By reducing withholding, these taxpayers will get smaller refunds next year.

The new tables do not affect single taxpayers whose wages are above \$53,200 or married taxpayers whose wages are above \$90,200.

Employees should be aware that this has no effect on total taxes owed in 1992. Therefore, those employees who wish to maintain withholding at the present level must submit a new Form W-4 to the Payroll Department. This form is available outside the Payroll Department office.

Any questions should be directed to Jo Baaske, Payroll Supervisor, at x2991.

Now at the Gallery

Tapestry Masterworks in Fiber

Tapestry Masterworks in Fiber by Lialia Kuchma will be exhibited at the Fermilab 2nd Floor Gallery. The show will run February 12 - March 31, 1992.

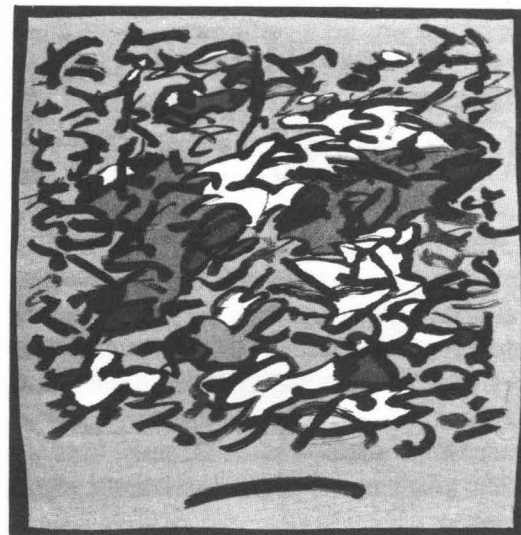
Tapestry artist Lialia Kuchma was born in Ukraine in 1943. Leaving her homeland with her family, she spent the remainder of the World War II years in the Regensburg detention camp in Europe. In 1947, the Kuchma family emigrated to the United States. Living first in Maryland and then in Pennsylvania, they found their permanent home in Chicago.

Lialia Kuchma studied at the School of the Art Institute of Chicago and Loyola University. She received her B.A. Fine Arts degree from the University of Illinois.

In 1977, she made her first and only visit to her native Ukraine, experiencing the culture and land she had known only through her family, church and community life in this country. The reunion visit also provided her with a bounty of artistic inspiration.

The vibrant primary colors which Lialia often uses in her tapestries suggest portions of her cultural heritage. Several most recent works convey a strong sense of motion, reflecting her impressions of wheatfields in the Ukraine. Additional works include powerful abstract designs based on the art of calligraphy, and the first colorful tapestry inspired by her floral photography. (Lialia Kuchma's photographs of flowers were a part of a group exhibit in Fermilab's Gallery in December, 1988.)

Other tapestries by Lialia include images of exotic, primal birds and animals, portraits of human be-



Newberry Calligraphics, a tapestry by Lialia Kuchma, is on display in the Fermilab 2nd Floor Gallery.

ings, and geometric patterns. She has completed several monumental triptychs.

Lialia has widely exhibited her tapestries, including shows at the Fiber Structure National Exploratorium in California, the Ukrainian Canadian Art Foundation in Toronto, Artemesia Gallery in Chicago, and a one-person show at the Ukrainian Institute of Modern Art in Chicago. Her work has been published in articles in two national fiber arts magazines.

She was in an invitation exhibition, "Through the Eye of the Camera," at Chicago's Textile Arts Centre, April 1991. Her most recent tapestry show was a multimedia juried group exhibition at the Kansas City Art Center held in September of this year. In September she was also invited to participate in the Lakeside Group's Artists-in-Residence Program, which is held annually in Lakeside, Michigan, for the benefit of both American and foreign artists. Her work is in many private U.S. collections.

The 2nd Floor Gallery is open to the public daily from 9 a.m. to 5 p.m.

On-site housing deadline

The deadline for receipt of reservations for summer on-site housing is March 2, 1992. Housing assignments will be made in April, and responses should be mailed out by April 15, 1992. The starting date for summer occupancy is June 1, 1992. For further information, please contact the Housing Office at 708 840-3777, VAX mail FNAL::HOUSING or Fax 708 840-2823.

Health, entertainment, recreation

A Recreation Office health & fitness tip

Why exercise?

Many things are important to a person's health, fitness and longevity. Exercise is one of the most important. There is complete agreement among doctors, heart specialists, sports medicine specialists, etc., that aerobic exercise of sufficient duration and frequency, and at the proper heart rate has many benefits including weight reduction, reducing fat, improved appearance, improved cardiovascular fitness and efficiency, lower rate of heart attacks and a much improved chance of recovery if one does occur, more energy, greater mental alertness, improved sleep, increased longevity, greater endurance and less fatigue, lower blood pressure and more.

Why measure pulse rate while exercising?

In order to obtain the maximum benefit from exercise, particularly in terms of cardiovascular improvement, it is important to exercise at the proper heart rate, and sustain this heart rate for a sufficient period of time. The heart, like any other muscle, can be strengthened by regular exercise. Medical authorities have determined the best pulse rate range for optimum cardiovascular conditioning and improvement. This rate is commonly referred to as the "target zone."

Fermilab International Film Society

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

Friday, March 13: Chocolat (French slang for both "black" and "cheated")

Story of a French girl; her father, a liberal official; her restless mother; and their house servant in French colonial Africa. Disturbing and powerful. Claire Denis, director, France, 1988, 105 minutes.

Friday, March 27: Virgin Spring

The brutal rape and murder of his daughter cause a father to seek vengeance. Best Foreign Film. Based on a 14th Century ballad. Ingmar Bergman, director, Sweden, 1959, 88 minutes.

How to determine your "target zone"

There are several different formulas for determining your target zone but all of them produce results that are very close to each other. The most common method is to first determine your maximum attainable heart rate by subtracting your age from 220. Then, your target rate is between a minimum of 70% of this result and a maximum of 85%. For example, a 40-year-old person has a maximum heart rate of 180 beats per minute ($220 - 40 = 180$), 70% of this is 126 and 85% is 153. Therefore, the optimal exercise pulse rate, or target zone, for a 40 year old would be between 126 and 153 beats per minute.

How long should you exercise?

Research has shown that for significant cardiovascular improvement to take place, the pulse rate has to be maintained in the target zone for a minimum of 20 minutes during each exercise session. In addition, a minimum of 3 to 4 exercise sessions per week are necessary with no more than 2 days elapsing between workout. Each session should also begin and end with a 5 to 10 minute warm up and cool down. A measurable improvement in cardiovascular fitness can be reached in as little as 3-4 weeks of exercising.

Source: *Creative Health Products*

Wild Lands Under Siege

Make plans to attend the special presentation *Wild Lands Under Siege*, Saturday, March 14, presented by Steve Packard of the Nature Conservancy and hosted by Fermilab.

There will be a panel discussion of natural areas in Kane County, volunteers to answer questions, slides and displays, stories of successful stewardship work and photos of site work—bring your curiosity! Sponsors include: The Nature Conservancy, Kane County Forest Preserve, Kane County Natural Areas Volunteers, Friends of Campton Hills. The presentation takes place from 9 a.m. to noon in Wilson Hall. A \$2 admission fee is required and refreshments will be served. For more information call 708 232-8433 or 708 428-5594.

Low-impact aerobics

Join the Fermilab aerobics classes and work out for cardiovascular benefit, muscle toning and flexibility. There will be low-impact routines, arm/waist exercises, floor work and stretching. The classes will be held on Tuesdays and Thursdays from 5:30 p.m. to 6:30 p.m. The 12-week session will run from Tuesday, February 25 until Thursday, May 14. The classes will be held in the exercise room at the Recreation Facility. There is a \$1 fee per class and a current gym membership is required.—Jean Guyer

Press Your Best

Ladies and gentlemen

Sign-up NOW for the 4th Annual "Press Your Best" contest! The contest will be held on Wednesday, April 8 from 11:30 a.m. to 1 p.m. You have eight weeks to train. You must sign-up on the weekly log sheet to enter. Winners will be selected for maximum press weight and highest % of body weight pressed. Include the weight of the bar in your total weight pressed (45 lbs.). A current gym membership is required. The sign-up sheet and rules are located at the Recreation Facility in the weight room. For more information, call Sheri at x4544.

Classified Ads

Vehicles

1982 Mercury Lynx, 5 dr, runs OK. \$300. Call Thornton, 708 462-9424, evenings and wkends.

1972 Dodge Sportsman van, rebuilt engine. \$500. Call Thornton, 708 462-9424, evenings and wkends.

Miscellaneous

Keeshond puppy, 12 wks old, female, AKC-OFA, health guaranteed, Champion Sire and Dam, excell. temperament. \$300. Call Jean at 708 888-3253 after 5 p.m.

0.45 Carat Marquis cut diamond ring with gold ring. Appraised at \$1,600. Will sell for \$850 or reasonable offer. Call Mike at x4518.

1982 Carver Cabin Cruiser, 28 ft, T/220 HP V-8's, enclosed head, galley, and much more. \$34,000 o.b.o. Call 708 892-7206.

Water heater, 40 gal., electric, A.O. Smith lo boy, excell. con., 3 yrs old. Asking \$75. Call Jerry at x4571 or 708 801-9408.

Oakland wood burning hot water heater, \$70. Bench top table saw, \$100. Call Jim at 708 584-6698 after 5 p.m.

Two CB radios - 23 channel, both in working con., \$25 for both or \$15 each. Call Jack at x3011.

NALREC news

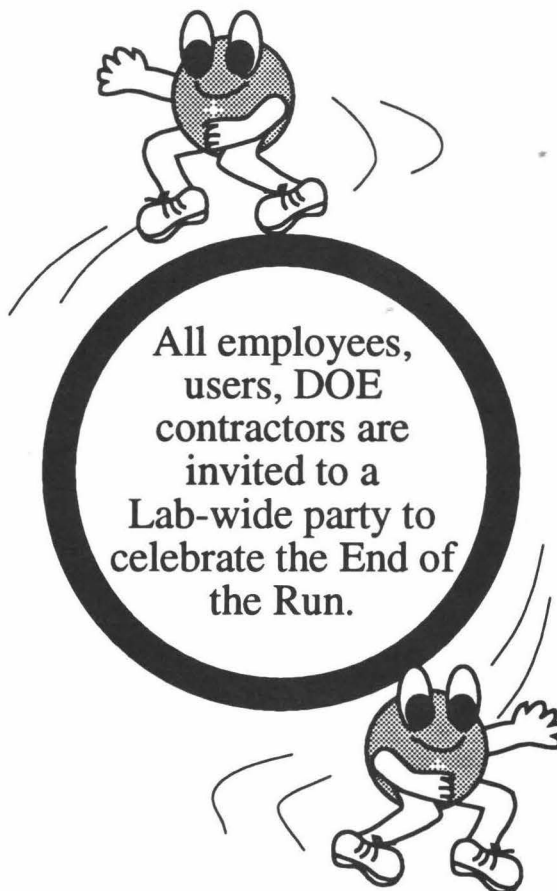
Don't miss the Leap Year/Sadie Hawkins' Day party Friday, February 28 at 5:15 p.m. George James and the Mood Express will provide the music. Connie's deep dish pizza will be served and raffle tickets will be drawn for restaurant certificates. You won't want to miss this so mark your calendar.

Invite your neighbors and head on out to the Warrenville Bowl for Candlelight Bowling on March 7 from 9 p.m. until 12:30 a.m. Great fun, good food and super door prizes all for only \$13.

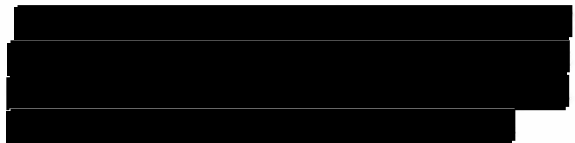
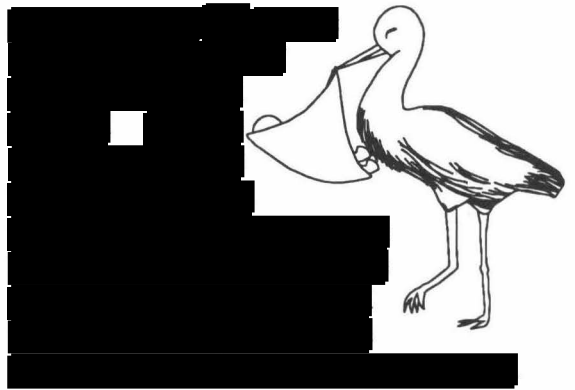
June 19-21 has been tentatively set for the white water rafting trip. Watch for the flier or talk to a NALREC member for more information.

In the works: a horseback riding trip.

Attention all baseball fans: We will be going to see the Kane County Cougars in 1992. Fermilab Day will be Saturday, June 13 at 7 p.m. It's a Saturday night; keep it in mind.—Charlotte Smith



Congratulations to:



Date: February 21, 1992
Location: Wilson Hall Atrium
Time: 3:30 p.m. to 6:30 p.m.

There will be food and drink.