FermiNews

Fermi National Accelerator Laboratory

Volume 21 | Friday, April 3, 1998 | Number 7

INSIDE

4 Shaevitz Profile
5 Essay Contest
6 Birds
8 LCW
9 Lambertsons
10 DuPage Road

Fermilab Users– A Physics Community Portrait for 1998

Clockwise from upper left:

Fermilab's users' soccer league has a strong multinational flavor.

Juan Valls of Rutgers University and Valencia, Spain is a CDF collaborator.

Doug Benjamin (left) and Alan Sill from Texas Tech University analyze equipment at the Silicon Detector Facility.

Photos by Reidar Hahn

More users from more states and more countries than ever before are gearing up for the physics of the 21st century at Fermilab.

By Judy Jackson, Office of Public Affairs

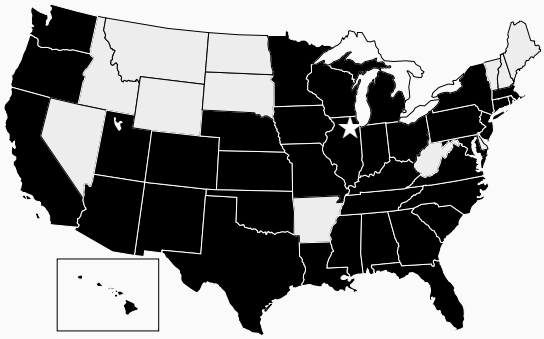
"Where else would I go?" asked the young physicist from California. Of course, she hastened to add, scientific goals and tastes vary, but "for me Fermilab is the best place in the world right now to do high-energy physics."

In 1998, 2,716 of her colleagues in the field of high-energy physics research agreed. They form the community of Fermilab users who come to the Laboratory from 225 institutions in 38 states and 23 foreign countries to carry out particle physics research at the energy frontier. For trend-watchers, the numbers are up, from 2,309 users from 188 institutions in 36 states and 20 foreign countries in 1997.

Fermilab's one-sentence mission is to "advance the understanding of the fundamental nature of matter and energy by providing leadership and resources for qualified researchers to conduct basic research at the frontiers of high-energy physics and related disciplines."

Those "qualified researchers" are what Fermilab defines as users: physicists and graduate students from universities and other research institutions, members of collaborations whose experiments are listed in the annual "Fermilab Research Program Workbook" for 1998. To be listed in the Workbook, an experiment must be "active"—

continued on page 2

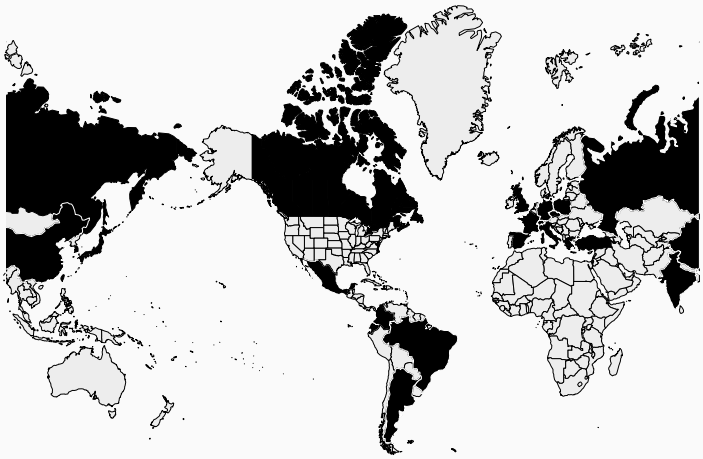


U.S.A., By States

Alabama 2; Arizona 21; California 175; Colorado 16; Connecticut 22; Florida 27; Georgia 3; Hawaii 7; Illinois 508; Indiana 66; Iowa 20; Kansas 20; Kentucky 1; Louisiana 7; Maryland 30; Massachusetts 103; Michigan 86; Minnesota 28; Mississippi 14; Missouri 1; Nebraska 4; New Jersey 29; New Mexico 41; New York 157; North Carolina 20; Ohio 17; Oklahoma 11; Oregon 4; Pennsylvania 67; Puerto Rico 9; Rhode Island 13; South Carolina 9; Tennessee 17; Texas 80; Utah 1; Virginia 28; Washington 13; Wisconsin 22.

U.S. Top 10 *Institutions (after Fermilab—299)*

1. Argonne 55
2. U Mich (Ann Arbor) 52
3. U of Rochester 48
4. Lawrence Berkeley Laboratory 43
5. U Chicago 35
6. U Ill-Champaign 35
7. Michigan State 34
8. Northwestern 32
9. SUNY Stony Brook 32
10. UCLA 30



International, By Countries

Argentina 2; Brazil 41; Canada 22; Colombia 9; Czech Republic 6; Ecuador 1; England 33; France 20; Germany 42; Greece 10; India 25; Israel 12; Italy 313; Japan 121; Mexico 29; Peoples Republic of China 25; Poland 6, Russia 238; South Korea 26; Spain 1; Switzerland 8; Taiwan 23; Turkey 1.

International Top 10 Institutions

1. IHEP, Protvino, Russia 96
2. INFN, Pisa, Italy 64
3. JINR, Dubna, Russia 55
4. University of Pavia, Italy- 39
5. University of Tsukuba, Japan 33
6. NFN, Genoa, Italy 30
7. ITEP, Moscow 29
8. CBPF, Brazil 29
9. PNPI, St Petersburg 28
10. IHEP, Academia Sinica, Taiwan 23

Users

continued from page 1

that is, in a stage of detailed design, construction, data-taking or data analysis. While most other national laboratories number industrial scientists among their users, all of Fermilab's users come from the world of academic research.

No better place for physics

Data from Collider Run I at the Tevatron, the world's most powerful particle detector, gave the evidence for the long-sought top quark, homed in on the mass of the force-carrying particle called the W boson, and revealed the last of the tribe of particles known as mesons, among other achievements. Data from the subsequent year-long fixed-target run of experiments that ended in 1997 are just beginning to yield up their harvest of new knowledge about matter-antimatter asymmetry, the nature of neutrinos, the character of the forces that act on the fundamental particles of matter, and the secrets of the quarks. As the Laboratory prepares for Collider Run II at the Tevatron— newly upgraded to achieve record-breaking rates of high-energy proton-antiproton collisions,—users look forward to a decade of unparalleled research opportunity. Experimenters' hopes are high for new physics discoveries that may lie just ahead.

David Gerdes, associate professor of physics at Johns Hopkins University and a member of the 450-scientist Collider Detector at Fermilab collaboration, is chair of Fermilab's Users' Executive Council.

"I'm at Fermilab because there is no better place on earth to do physics for the next decade," Gerdes said recently. "Look at it this way. CDF is a mature experiment. We're about to celebrate our 25th birthday. Yet 95 percent of all the data that CDF will ever take over its lifetime has yet to be taken. It may even be more, if the historical pattern of under-estimating accelerator performance holds true. It's very exciting."

Gerdes added that his colleagues across the Tevatron ring at the younger DZero collaboration are anticipating an even larger percentage of lifetime data-taking in Run II.

Fermilab users are devoting 1998 to analyzing and publishing data from the earlier accelerator runs and to feverishly preparing CDF and DZero, the two collider detectors, to be ready for Run II when it begins early in the year 2000.

"The thing I hope for most," said Young Kee Kim, assistant professor of physics at the University of California at Berkeley, "is that

Photo courtesy of UVa

◄UVa members of the KTeV collaboration: Karla Hagan-Ingram, Alexander Ledovskoy, John Adams, Brad Cox and Mike Arenton.

Photo by Reidar Hahn

DZero electronics get an inspection from the University of Arizona's Ken Johns, Ajay Narayanan, Kevin Davis, and Freedy Nang.

Fermilab will have the resources to finish the Main Injector and the collider detector upgrades and get going on the physics of the next decade."

That's what Fermilab hopes for as well. According to Laboratory Director John Peoples, Fermilab is devoting 72 percent of its direct program funding in FY1998 to finishing the Main Injector project, upgrading the collider detectors, and completing other critical work to prepare for Run II.

"Where ya from?"

Of the total 2,717 Fermilab users, 1,703 come from U.S. institutions in 38 states: Missouri and Utah are newcomers this year. The Laboratory's 1,014 foreign users come from 23 foreign countries with Spain, Ecuador and the Czech Republic joining the list for 1998.

Not surprisingly, the largest U.S. delegation comes from Fermilab's home state of Illinois, with 508 experimenters. But no other American state matches the delegations from Italy (313) or Russia (238). And only California (175) and New York (157) have more Fermilab experimenters than Japan (121). Lunchtime conversations in Fermilab's central Wilson Hall cafeteria occur in an exhilarating mixture of languages, and social gatherings feature a delicious range of international cuisines. Each school day morning, the yellow school bus from the West Chicago School District picks up children from Russian, Italian, Japanese and other international families who live on site in the Fermilab Village.

Of the total number of scientists doing physics research at Fermilab, 555 are graduate students working on Ph.D.s in physics or astrophysics. Like their professors, they come to Fermilab for the scientific opportunities the Laboratory offers.

"When I had the opportunity to be a grad student on an experiment to find the last unseen particle in the Standard Model, it was too good to pass up," said John Trammel, a student at the University of Minnesota. Trammel's experiment, nicknamed DONUT, is combing through the data from the recent fixed-target run to find direct evidence for the tau neutrino, the only "unseen" particle remaining among the quarks and leptons of the prevailing theory of the fundamental structure of matter. Physicists have enough indirect evidence for the tau to be sure it exists, but they have not yet seen its footprints. Trammel and his DONUT colleagues hope to spot them soon.

Linda Coney, a DZero graduate student from Notre Dame University, found that joining Fermilab as a graduate student means joining the worldwide family of particle physics.

"Even as a graduate student at Fermilab," Coney said, "you are included in the community of particle physics. As a grad student, you have chances to give talks at conferences and participate in the research life of the field. By the time you get a Ph.D., you are part of the high-energy physics world."

continued on page 11

Photo by Jenny Mullins

Linda Coney, a graduate student from Notre Dame and a DZero collaborator, joined the high-energy physics family when she came to Fermilab.

Profiles
IN PARTICLE PHYSICS

Mike Shaevitz

Cospokeperson for NuTeV

Director of Nevis Laboratory, Columbia University

Professor of Physics, Columbia University

I.D.# 00770V

By Mike Perricone, Office of Public Affairs

As a kid in Columbus, Ohio, Mike Shaevitz liked to build things, and he liked to take things apart.

As a Caltech postdoc at Fermilab, he helped to build the Lab E neutrino detector from scratch. He and his teammates started with an empty building in 1975, winding up with 690 tons of calorimeter, 420 tons of magnet, and "wires everywhere," he says with a laugh.

Now he has to help take it all apart—symbolically, at least. NuTeV ("Neutrinos at the Tevatron") experiment E815, proposed in 1990 to take advantage of the increased intensity at the Tevatron, is the last of six CCFR (Columbia-Chicago-Fermilab-Rochester) neutrino experiments using the Lab E detector. It will close out the 15-year Lab E neutrino program.

"I hate to see it go," said Shaevitz, now a salt-and-pepper-haired professor of physics at Columbia University and cospokesman with Bob Bernstein for experiment E815. "But it's time to go on to other things. And we're terminating with a bang."

The "bang" is the 18-month run of E815 that finished in September, 1997. The data analysis has been fast and furious, and the initial preliminary data offer tantalizing implications for Fermilab in Run II.

Photo by Reidar Hahn

The 30-member collaboration used a new type of neutrino beam called the "sign-selected quad-triplet beam", passing through the kilometer-long mound of earth and old steel outside Lab E that filters out extraneous particles and produces what Shaevitz describes as a very clean beam of neutrinos. The fixed-target experiment measured the weak mixing angle, which describes the amount of electromagnetic force in the weak interaction, and is complementary to measurements of the W-boson mass at DZero and CDF. The experiment produced a new mixing angle measurement of $\sin^2(\Theta_W) = 0.2199 +/- 0.0022$, which corresponds to a W-boson mass measurement of $M_W = 80.54 +/- 0.11$ GeV.

Among its repercussions, that measurement complements others in pointing to a relatively light estimate for the mass of the Higgs boson, theorized as the origin of mass—dubbed "the God Particle" by physicist Leon Lederman.

"It's a very weak dependence, so it's hard to make a definitive statement on the Higgs," Shaevitz said. "But our measurements, and the collider measurements of the mass of the W boson, are favoring a Higgs boson mass in the range of 100 to a few hundred GeV. If the Higgs mass is light enough, it's possible the colliders here might be able to see it in the next run. Which would be very nice."

If E815 helps point the way to the Higgs, Shaevitz's career-long fascination with neutrinos gets some of the credit. As a grad student at Ohio State, he encountered an Atomic Energy Commission pamphlet titled "The Elusive Neutrino," starting him on the path. A high school textbook had tipped the balance toward physics.

"Around 1963-64, I was in one of the first high school classes to use the new Physical Science Study Committee textbooks," he recalled. "Being able to explain how things work from the atomic scale to the cosmos was what fascinated me. I knew I wanted to do physics research."

Shaevitz is the Director of Nevis Laboratories, the particle physics, nuclear physics and astrophysics research facility for Columbia University's Physics Dept. He and his wife, Linda, live in Irvington, N.Y., just north of New York City. Their youngest son, Daniel, starts at Columbia next year as an engineering student; their oldest son, Joshua, is a junior physics major at Columbia.

"They both like to build things," Shaevitz said, adding with a laugh: "And Joshua is definitely another experimentalist, not a theorist." ■

FermiNews Essay Contest

FermiNews announces its first-ever essay contest, for the best answers to the question

"Why should the U.S. remain a world leader in the science of high-energy physics?"

First Prize

FermiNews will award a bottle of Moët et Chandon Dom Pérignon Cuvée 1990 (purchased at the editor's personal expense!) to the writer of the essay of 500 words or less that best addresses the question, "Why should the U.S. remain a world leader in the science of high-energy physics?"

Second Prize

To the second-place winner, Congressman Vern Ehlers (R-MI), who is conducting a National Science Policy Study for the U.S. House Committee on Science, has offered the prize of an American flag flown over the U.S. Capitol.

Photo by Reidar Hahn

Plus... The first- and second-place essays will be printed in *FermiNews* and published on the Fermilab website.

And... Perhaps most important, the essayists will be performing a much-needed service to the research community. The winning writers can be sure that their words will be widely cited, copied, borrowed and appropriated by all those who strive to communicate the nature and value of U.S. leadership in high-energy physics research.

Who may enter:

Anyone. Employees of DOE and NSF, as well as relatives and close friends of the FermiNews editorial staff, are not only allowed but strongly encouraged to enter.

The judges:

The first- and second-place essays will be chosen by a distinguished panel of judges:

- Robert Eisenstein, Assistant Director for Mathematical and Physical Sciences, National Science Foundation
- Peter Rosen, Associate Director for High Energy and Nuclear Physics, U.S. Department of Energy
- Curt Suplee, Science Writer and Editor, *The Washington Post*
- Michael Witherell, Chair, High Energy Physics Advisory Panel

How to enter:

Submit an essay of 500 words or less addressing the contest question to *FermiNews* by Tuesday, May 5, 1998. *FermiNews* will accept essays in virtually any form: e-mail (ferminews@fnal.gov); FAX (630-840-8780); snail mail (*FermiNews* , Office of Public Affairs, Mail Station 206, Fermilab, P.O. Box 500, Batavia, IL 60510); hand delivery (Wilson Hall, 1E). The essay submission should include the writer's name, e-mail address and telephone number.

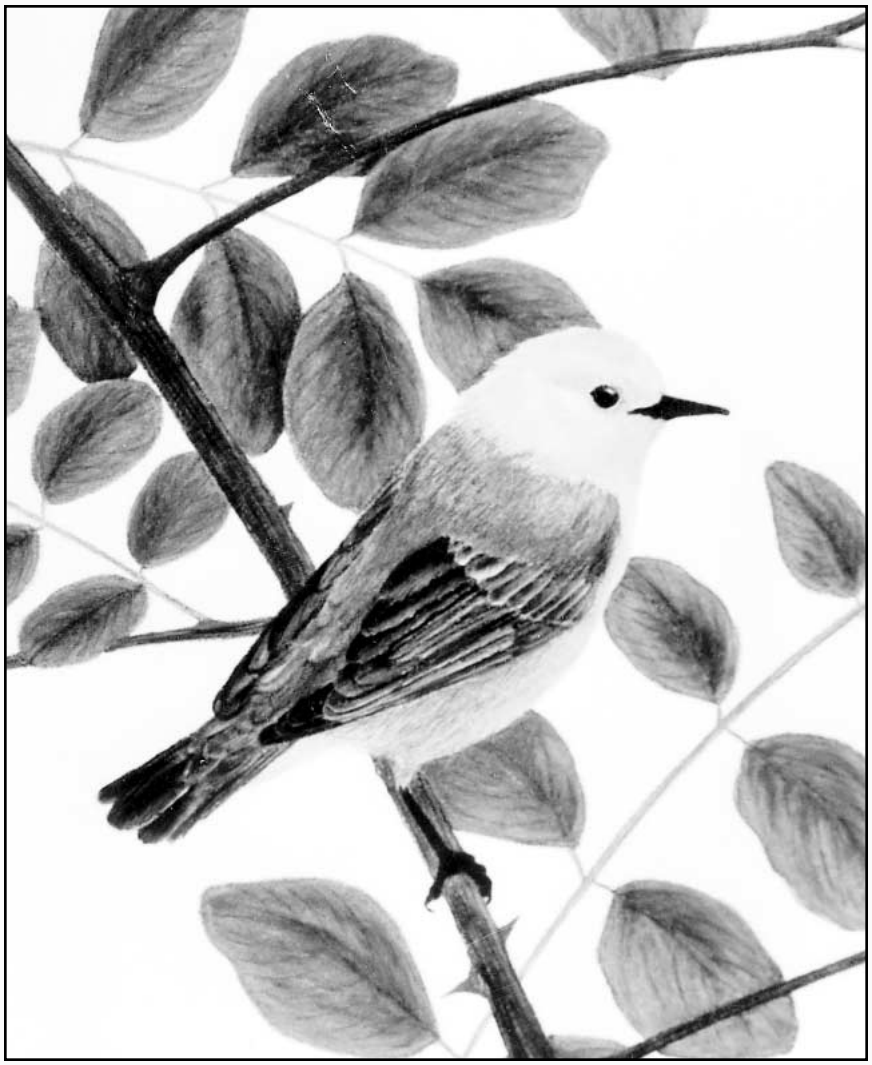
FermiNews will announce the winners and print the two winning essays in the June 5 issue.

Questions? Call the Fermilab Office of Public Affairs (630-840-3351) or e-mail *FermiNews* (ferminews@fnal.gov).

Dom Pérignon, named for the blind French monk who "invented" champagne, is among the world's best champagne. "Toasty, earthy aromas and an expanding mousse make this an unusually assertive Champagne. Creamy in texture, ripe and fruity in flavor..." says *Wine Spectator* of Dom Pérignon Cuvée 1990. Why a French champagne for a *FermiNews* contest? Although other nations now also toil in the vineyards, France remains a world leader in the production of fine wine.

The Birds of Fermilab

ILLUSTRATIONS BY DENIS KANIA



Prothonotary Warbler

by Sharon Butler, Office of Public Affairs

A landscape of high technology and powerful machines hardly lays a welcome for wildlife. But Fermilab is different. Its diverse and relatively undisturbed habitats make the 7,000-acre campus not only the best bird-watching location in DuPage County but one of the best in the entire Chicago area. By last count, according to physicist Peter Kasper, the Laboratory's resident birder, Fermilab claimed 262 species of birds.

Some are just occasional visitors, like the peregrine falcon that settled one year on the upper ledges of Wilson Hall. Inside on the upper floors, curious onlookers daily watched as the bird swooped to catch a pigeon in mid-air and then feasted on its prey just outside the windows.

Other birds spend their winters here: northern shrikes, juncos and American tree sparrows. A flock of long-eared owls might rush out of the pines. Some of these seasonal visitors take us by surprise. Wintering common snipes, for example, were never expected. They prefer marshy areas, where, with their long beaks, they dig deep in the mud for tasty crustaceans. Usually they fly farther south to find their winter homes. But five years ago, snipes showed up at Fermilab, having found that the drainage ditches of warm water from the Industrial Building served just as well.

Many species are just passing through. In late winter and early spring, the lakes fill with waterfowl of amazing variety. You might spot a rare snowy-white ross's goose, for example, or even a tundra swan.

In spring, upland sandpipers come to nest in Fermilab's open fields of nicely

Blackburnian Warbler

White-breasted Nuthatch

Nelson's Sharp-tailed Sparrow

Eastern Screech Owl

Common Redpoll

Ruby-throated Hummingbird

mown grasses. The grounds crew is eager to accommodate the birds, keeping out invasive goldenrod and woody plants that would destroy their home.

In summer, when waterfowl abandon the lakes, the surrounding cattails and grasslands fill with marsh wrens and bobolinks. Songbirds such as the yellow-breasted chat or the brown thrasher sweeten the scrubby areas with their repeated melodies.

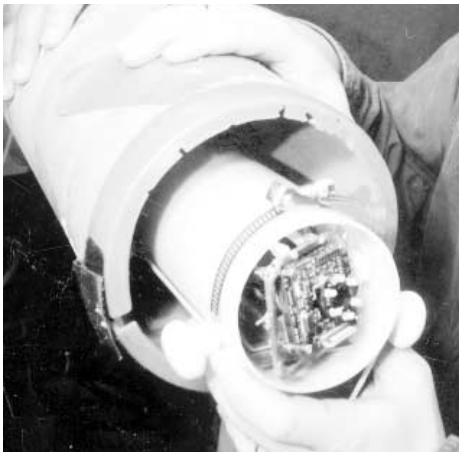
Fermilab has permanent residents, too, like the great horned owl and the red-tailed hawk that have been trading nests for the last 12 years. The two nests hang like oversized baskets from oaks in the savanna beside the bison pasture. A poor housekeeper, the owl lets her nest deteriorate and, when it has fallen into disrepair, steals the hawk's when the bird is out dining on rodents. The hawk doesn't seem to mind. She moves back into the owl's old nest, and, once again, tidies up.

On occasion, science and birds do get in each other's way. A couple of years ago, for example, Kasper found a cooper's hawk nest in a tree beside the road leading to the construction site for the Main Injector. Power lines were scheduled for installation, one of them running right beside the nest. But managers for the project agreed to alter the schedule; utility crews put in electrical poles at the other end of the road first. The changes occurred without setting science back.

Luckily, science and wildlife can usually find a way to coexist. ■

Lab 3, Bugs 0: Repair Crews Winning the Battle of LCW

By Mike Perricone, Office of Public Affairs



A robot camera developed by Todd Johnson and Duane Plant is inserted into the LCW system.

Johnson and Plant view videos from the robot camera.

Photos by Reidar Hahn

Repairing one of the 4,000 welds in the LCW system.

Patrick Hurh is a mechanical engineer, not a microbiologist, but he's become a near-expert on three strains of bacteria named *gallionella*, *sphaerotilus*, and *clostridium*.

"They're the three main culprits," said Hurh, who along with fellow engineer Mike May is coordinating repairs to the Main Injector's Low Conductivity Water system.

The "bugs" spawned in well water left standing for as long as six months in some sections of the stainless steel LCW pipe. The bacteria formed nodules lodging in cracks in the "tack welds," which had held the curved pipe sections temporarily in place for the permanent welds.

The nodules (dubbed "bug houses") produced a high concentration of acid; a high galvanic potential; corrosion; and some 200 leaks, discovered in November, 1997.

Hurh calls the resulting $800,000 repair project "a three-ring circus." But installation and commissioning manager Phil Martin believes he can hold to his original goal of introducing beam in the Main Injector before Sept. 15, 1998, within a year of the Tevatron shutdown.

"I think that's quite an achievable task unless we have additional setbacks," Martin said.

Hurh, May and their crew compiled a database on every repair for every weld. Although only 200 leaks appeared, Fermilab must repair all the welds in the affected areas. Bob Ducar and Cons Gattuso placed a number on each weld with felt-tipped markers, keyed to videotapes of all 2,200 weld sites in the pipe's interior—and 300 welds in each of the six service buildings above.

How do you videotape the interior of thousands of feet of six-inch pipe—in full color? Duane Plant and Todd Johnson created a robot camera using a parabolic mirror, gimbal-mounted lens, full-color CCD (Charge-Coupled Device) chip, and tiny LEDs (light emitting diodes) using only 20 milliamps of current.

"We put them together on our workbenches at home," said Plant, adding that they quickly obtained the needed components with the new Pro-Card ordering system instituted by the Business Services Section.

Two vendors, each with two crews of four people, are working under a "quality assurance program": four weld repair technicians trained as inspectors in Fermilab's welding shop. Overlay welds are the main technique; the crown of the original weld is ground off, then two passes result in a higher-quality weld.

The system's interior can be cleaned mechanically, with a robotic machine using flapper wheels and brushes; or chemically, with a solution of 20 percent nitric acid and 3 percent hydrofluoric acid requiring costly disposal methods.

"You can't just pour that stuff down a sewer," Martin said, adding that Peter Mazur from Technical Division has been investigating the chemical cleaning, and working with Gale Pewitt on investigating the mechanical cleaning, freeing Hurh and May to focus on repair work. Mechanical cleaning could leave debris in the pipe; an outside vendor has quoted $200,000 for the job. May has been working on a custom-built system that could be substantially less expensive.

The project's final stage centers on prevention. Ultraviolet sterilization will destroy bacterial DNA, preventing bugs from reproducing. "Corrosion coupons," pieces of metal containing welds, will be placed in the water and periodically inspected for corrosion. The last resort: commercial clamps ($40 each), similar to those used for leaks in submarines, can be bolted around the pipe.

Martin concedes that the repairs have had a "severe impact," but he anticipates the welds will be completed in May, and the internal cleanup, in June. He wants to commission the accelerator in August, and hopes to have part of the LCW system holding water next month.

"We'll keep the pumps circulating," Martin said. "This time, we won't have water standing around in there." ■

The Lambertsons Are Done

by Sharon Butler, Office of Public Affairs

As Dave Johnson, of the Main Injector Department, figures it, the 16 Lambertson magnets now stored and ready for installation are key components of the new Main Injector and the upgraded Tevatron. Without the Lambertsons, you couldn't get beam out of the one and into the other.

In March, technicians finished the last of the 16 magnets. But designing, prototyping and building the Lambertsons was no simple task. The project spanned four years, with 20,000 man-hours in production.

The Lambertsons "extract" beam from the orbit of circulating protons or antiprotons in the Main Injector, whether to send protons on to the Neutrinos at the Main Injector experiment, abort the operation, or forward particles to the Tevatron. The Lambertsons also "inject" beam into the Tevatron, a process Johnson likens to merging onto the Kennedy Expressway. When injecting beam into the Tevatron, the magnets have to bend the rising beam down and align it vertically with the circulating beam; when extracting beam from the Main Injector, they have to do the opposite, deflecting protons away from the circulating beam's path. Either way, steering is everything.

For both tasks, Johnson and his colleagues opted for a single design. The result was a 10-foot-long silver-painted magnet weighing the equivalent of two elephants. The magnet carries two beams at once, the circulating beam and the beam that is being injected or extracted.

The trick is to have two apertures, one that is free of any magnetic field (for the circulating beam) and one that is not. The apertures are separated with a "septum" that insulates one hole from the other. Beyond or before the Lambertson, a pulsed magnet "kicks" the incoming or outgoing beam over the septum to merge with or diverge from the circulating beam.

The Lamberston magnet septum was conceived (and patented) by Dr. Glenn Lamberston of Lawrence Berkeley National Laboratory in the mid-sixties, and was first used here at Fermilab. The new Lambertsons have a symmetrical design, the brainchild of Mike May, in the Mechanical Support Group. There is a two-part central core, encased in a vacuum jacket, consisting of a horizontal row of about 3,000 thin steel plates, called laminations. They are pressed together and "tied" with steel bars. Outside is a steel outer core, also in two facing sets of laminations, which returns the magnetic flux.

Since the inner core sits inside the vacuum pipe, it is susceptible to contamination, and handling required the use of white gloves.

"If the grease from the mayonnaise on your ham sandwich gets onto the laminations, it could take days to pump the system out and get a good vacuum," Johnson said.

The staff involved in the magnet's design and development had to consider many variables, from the shape of the laminations and the hole for the circulating beam, to the kind of steel and the structural forces on the components during construction—the last of these the headache of Nelson Chester, in the Technical Division.

With a three-dimensional magnetic model, François Ostiguy, of the Beams Division, helped devise a solution to the troublesome magnetic end fields, which could interfere with the circulating beam. The solution: magnetic mirror plates.

Finally, Linda Alsip, the buyer for the project, kept track of the hundreds of parts, orders and drawings required to assemble the magnets until, finally, the last of the gleaming new Lambertsons stood waiting on the production floor for the opening of Run II. ■

Dave Johnson, of the Beams Division, and Nelson Chester, of the Technical Division, install the seal on the end vacuum flange of a Lambertson magnet.

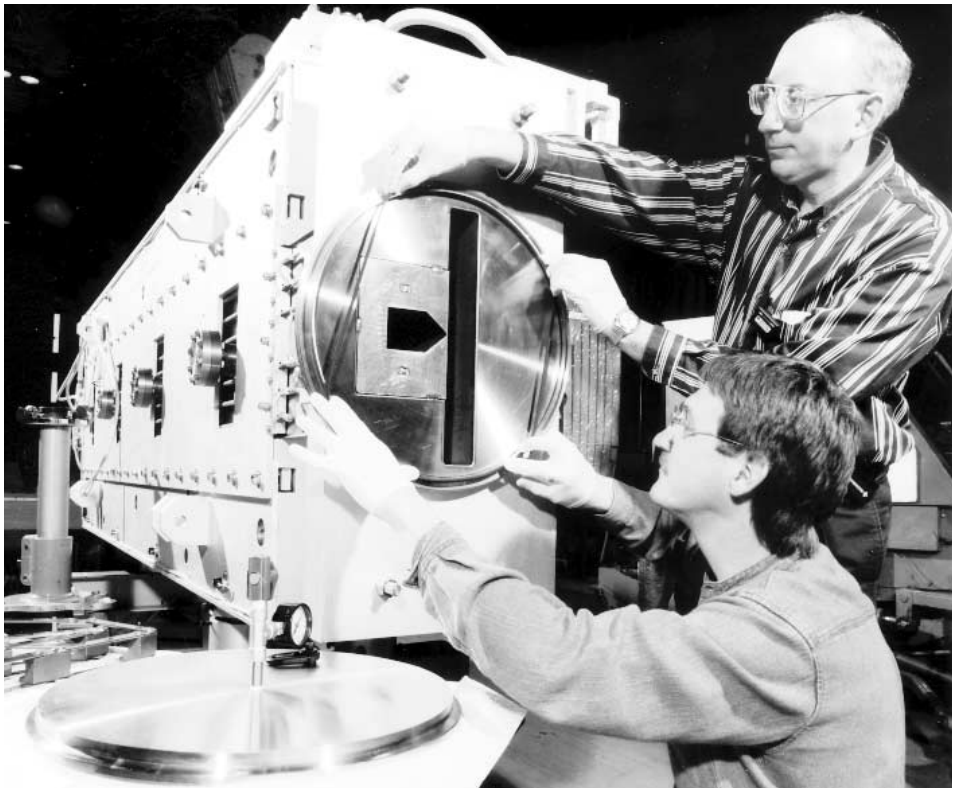


Photo by Reidar Hahn

DuPage Consultant Presents Road Study

But Fermilab and DOE say they need to know more before going forward.

By Judy Jackson, Office of Public Affairs

After presenting the results of a preliminary study last month, officials of HNTB, a Chicago architecture and engineering firm retained by DuPage County, said they hoped to report to the County that the study had "substantially addressed" Fermilab and Department of Energy concerns about a proposed county highway through the Laboratory. However, DOE and Fermilab officials said they could not offer such assurances on the basis of the study.

HNTB engineer Chris Rops summarized the five-month study at what Rops described as a "workshop" at the Laboratory on March 13. DuPage County officials did not attend the meeting.

Spreading a plan of the Fermilab area on the floor, Rops showed two routes the firm had studied for a north-south road that DuPage County has proposed for consideration. One route paralleled Kirk Road on the west side of the Laboratory; the other hugged the site's eastern boundary, curving west to meet Eola Road north of the site's southern edge.

Rops said the study had not examined the option of widening the existing Kirk Road as an alternative north-south route.

After Fermilab and DOE officials raised questions about the west-side route, attention focused on the eastern proposal. The proposed route curved to skirt a pond but otherwise cut a straight path just west of the Commonwealth Edison power lines of the Laboratory's eastern border with Warrenville.

Rops explained that the current study was preliminary to a far more extensive and expensive Phase One study that would be required if DuPage County officials decided to proceed with a north-south road proposal. Before undertaking the expense of a Phase One study, Rops said, the County sought assurances from DOE and Fermilab that the study's eastern route would be "something the laboratory could live with."

However, DOE's Richard Stenzel said DOE and Fermilab would require far more information including the results of a federal Environmental Impact Study before agreeing to any potential route.

Fermilab Associate Director George Robertson concurred.

"Building a road through Fermilab would constitute a major federal action," Robertson said. "It would require an EIS, which must address the alternatives, including no action and improving existing routes."

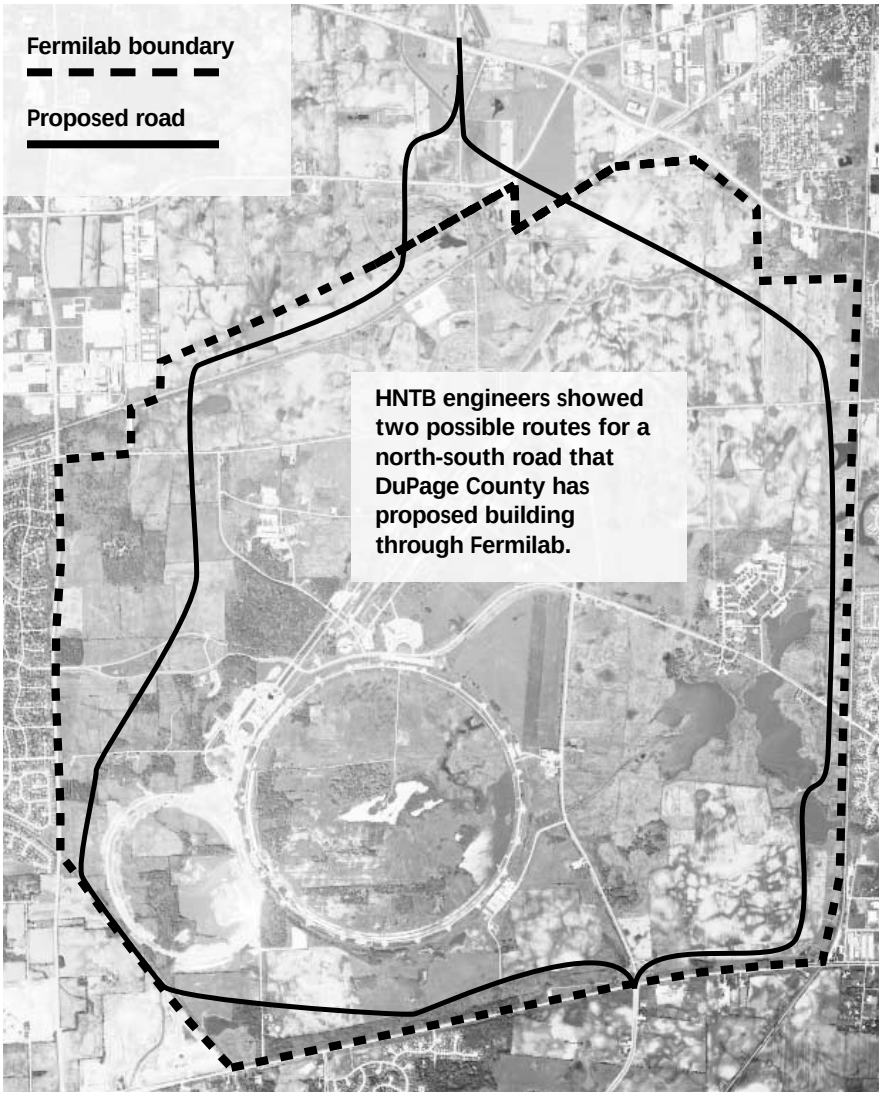
Laboratory officials also underlined their commitment to seek community views before making any decisions about a proposed road.

"A road through Fermilab would affect not only the Laboratory but many other citizens of Kane and DuPage Counties," said Associate Director Bruce Chrisman.

Laboratory officials added that seeking out and considering community views would play a significant part in the decision whether to allow a road through Fermilab.

Robertson noted the recommendations for future particle accelerators in the just-released report, "Planning for the Future of U.S. High Energy Physics," by the Gilman Subpanel of the High Energy Physics Advisory Panel.

"Two of the three possible future U.S. accelerators are under active study at Fermilab," Robertson said. "We need to be very careful that no one builds a road that would prevent Fermilab from responding to the future needs of the U.S. high-energy physics program." ■



HNTB engineers showed two possible routes for a north-south road that DuPage County has proposed building through Fermilab.

David Gerdes, chairman of the Users Executive Committee, would like "a schedule I can trust."

Users

continued from page 3

Because many graduate students spend months, even years, at Fermilab, the Laboratory and experiments try to recreate some aspects of university life. "The University of DZero," a Thursday night pizza-and-lecture series for DZero grad students, has recently broadened its scope to become "Tevatron University," and it now includes students from other experiments. Can "Property of Tevatron University Athletic Department" t-shirts be far behind? A bi-weekly film series and a new soccer field offer cultural and recreational opportunities.

Still, users say, not everything is perfect at the energy frontier. Johns Hopkins' Gerdes finds Fermilab's ever-changing schedule of accelerator operation troubling. (The term "Fermilab schedule" is an oxymoron, runs an old joke.)

"I'd like an operating schedule I can trust," Gerdes said. "I think very often users don't understand what goes into making the Fermilab operating schedule, and it can be frustrating."

Graduate student Arnold Pompos, a Czech native from Purdue University, sees a need as well, for more opportunities for student interaction at the Laboratory. Pompos would also like some mountains nearby, to provide relief from Fermilab's prairie flatness and keep him from getting homesick for his native Czechoslovakia. The weather, most users said, could be better in Batavia. And if Berkeley's Kim could change just one thing about Fermilab, she says, "I'd make it closer to California."

Still, most Fermilab users say, they wouldn't want to be carrying out their research anywhere else. Karen Byrum is a particle physicist at Argonne National Laboratory and a CDF collaborator.

"I want a facility where I can do high energy physics," Byrum said. "At this time, Fermilab is the place to be." ■

CALENDAR

APRIL 4

Fermilab Art Series presents: The Makoche Tour, $17. Performance begins at 8 p.m. in Ramsey Auditorium, Wilson Hall. For reservations or more information, call 840-ARTS.

APRIL 10

Fermilab International Flm Society presents: *Shall We Dance? (Shall We Dansu?)*, Dir: Masayuki Suo, Japan (1996). Admission $4, in Ramsey Auditorium, Wilson Hall, at 8 p.m.

APRIL 12

Easter barn dance at the Village Barn from 7–10 p.m. Live music by Fred, Mitch, & Co., with calling by Tony Scarimbolo. The dances are contras, squares, and circle dances. All dances are taught, & people of all ages & experience levels are welcome. You don't need to come with a partner. Admission is $5. Children under 12 are free. Sponsored by the Fermilab Folk Club. For more information, contact Lynn Garren, x2061 or Dave Harding, x2971.

APRIL 17

NALWO pot luck dinner at Kuhn Barn. Drinks & appetizers at 6:00 p.m. Dinner begins at 6:30 sharp. Everybody is asked to bring either a main dish serving 6-8 people, a dessert for 12 or contribute $3. We will have soft drinks for everybody, pizza for the kids and wine for adults. Babysitting is also provided. For further questions, call Angela Jöstlein (630) 355-8279.

APRIL 19

Afternoon barn dance at the Village Barn from 2–5 p.m. Live music by Pearly Gap, with calling by Tom Senior. The dances are contras, squares, & circle dances. All dances are taught, & people of all ages & experience levels are welcome. You don't need to come with a partner. Admission is $5. Children under 12 are free. Sponsored by the Fermilab Folk Club. For more information, contact Lynn Garren, x2061 or Dave Harding, x2971.

ONGOING

NALWO coffee mornings, Thursdays, 10 a.m. in the Users' Center, call Selitha Raja, (630) 305–7769. In the Village Barn, international folk dancing, Thursdays, 7:30–10 p.m., call Mady, (630) 584–0825; Scottish country dancing Tuesdays, 7–9:30 p.m., call Doug, x8194.

Conversational English classes, 9–11:30 a.m., Thursdays, in the Users' Center.

CLASSIFIEDS

FOR SALE

■ Nordic Track exercise ski machine, hardly ever used, $450 obo; skis, Atomic Arc 195, Salomon 547 sport bindings, size 12 US or 13 EU Trappeur 2000 boots, also have poles, ski & boot bag, $200 obo. Contact Terry, x4572 or skweres@fnal.gov.

■ Five VW Aluminum Rims & Tires. GTi, GL style rims in excellent shape with center caps. Michelin tires (185/60R14 82H) mounted & balanced with good tread. One of the tires is brand new. $500 for five; Women's down jacket, like new, blue, x-large, $40. Call (630) 243-1125.

■ Celebrate the third anniversary (!) of the publication announcing the TOP QUARK Discovery by DZero at Fermilab: Order a commemorative T-Shirt, from the "Run II" reprint of an original "Run I" discovery design (based on real data taken by real crazy people). No upgrade deemed necessary, still comes in q-qbar primary colors on white cotton; "flashy", not "trashy"! Budget for future runs highly uncertain, so Discover the Matter for yourself on the web at http://d0sgi0.fnal.gov/~tartagli/TShirt.html. Order from there before April 15, for a kinder gentler collaboration.

WANTED

■ Golfers (male or female) for the Tuesday Night Hughes Creek League.There's room for a complete 4 person team plus openings as regulars or subs on existing teams. Competition starts April 28. Contact Don Arnold, x2871 (arnold@fnts37.fnal.gov) or Bob Andree x3703 (andree@fnts37.fnal.gov). Don't delay, act today!

LAB NOTES

Fermilab Golf Leagues

Its almost spring and time to think about Golf! Come join us for some fresh air, exercise and meet new friends. Play begins in April and there are openings in all four leagues, for information call the following:

Fox Valley - Tuesdays - April 7
Michelle Gleason, x3211 or michelle@fnal.gov
Gary Golinski, x4055 or golinski@fnal.gov

Hughes Creek- Tuesdays - April 28
Don Arnold, x2871 or arnold@fnal.gov
Bob Andree, x3703 or andree@fnal.gov

Fox Valley - Wednesdays - April 8
Terry O'Brien, x4851 or obrien@fnal.gov
Mike May, x4948 or mikemay@fnal.gov

St. Andrews - Wednesdays - April 22
Pat Liston, x2332 or pml@fnal.gov

Sign up fees due April 1 to the league officers you signed up with.

MILESTONES

AWARD

The Fermilab Library was awarded a $20,119 grant under the Digitizing Illinois Collections category of the Illinois State Library's Educate and Automate competitive grant program. The funds will be used to make pre-1995 Fermilab reports available on the Web in full text.

DIED

Gerald DesJardin, formerly of the Technical Support/Magnet Production on March 14. Sally Smith on March 15. Michael Oros, Business Service/FM/FO on March 17.

LETTER TO THE EDITOR

In reading the interesting article entitled "What is Electroweak Symmetry Breaking, Anyway?" published in *FermiNews* (January 23, 1998), I was rather taken aback concerning two points:

—It is rather shocking that after the recent award (in August of last year) of the European Physical Society to Robert Brout, François Englert and Peter Higgs for their independent but essentially simultaneous discovery of the generation of the massy gauge vector mesons through spontaneous broken symmetry (usually called Higgs mechanism), there was no reference to the work of R. Brout and F. Englert. In point of fact, a consultation of the dates when these articles were submitted for publication shows that the work of Brout and Englert preceded the one of Higgs by a few weeks.

—The emphasis on the existence of a massy scalar particle (often called the Higgs) is somewhat exaggerated. In their acceptance speeches of the E.P.S. award, Brout and Englert tried to put this problem into proper prospective. Suffice it here to say that the upshot is:

1. When there is spontaneous broken symmetry there is *always* a massy scalar mode, be it in the context of gauge theory or not.

2. This massy mode may come about because of the existence of an elementary scalar field or by a dynamical mechanism (such as in the Nambu Jona-Lasinio theory).

In either case, the massy mode will present itself as a resonance. Whether or not its width is narrow enough for it not to be swamped in the continuum is a question concerning the parameters of the theory. Thus the interest of the experiment is to obtain some information on these parameters... in the event that the resonance is found. But in no way are all fundamental ideas concerning the Standard Model contingent on its observability.

Yours sincerely,

Philippe Spindel
Universite De Mons-Hainaut, Belgium

FermiNews
Fermi National Accelerator Laboratory

Published by the
Fermilab
Office of Public Affairs
MS 206
P.O. Box 500
Batavia, IL 60510
630-840-3351
ferminews@fnal.gov

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

The deadline for the Friday, April 17, 1998, issue of FermiNews is Tuesday, April 7.

Please send your article submissions, classified advertisements and ideas to the Public Affairs Office, MS 206 or e-mail ferminews@fnal.gov.

FermiNews welcomes letters from readers. Please include your name and daytime phone number.

☆ U.S. GOVERNMENT PRINTING OFFICE:
1998--646-054/80013

50%
TOTAL RECOVERED FIBER
10% POST-CONSUMER FIBER