FermiNews

Fermi National Accelerator Laboratory

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INSIDE

Photos by Reidar Hahn

E866: Fermilab scientist Chuck Brown (right) and Rusty Towell, a graduate student from the University of Texas at Austin, check electronics in E866's large drift chamber.

E831: Seong Sook Myung, from the University of Korea, works on equipment.

Fixed-Target Run Roars to Finish Line

Beam to the fixed-target experiments is scheduled to be shut off in September, ending a successful year probing the secrets of matter.

by Sharon Butler, Office of Public Affairs

On a day in mid-September, a switch will be flipped, the power supply locked out, circuit breakers around the Main Ring cut.

And in the two hours or so that it takes to complete those operations, a year's run will come to an end, closing down Fermilab's fixed-target experiments, capping a remarkable 25-year history of discoveries and shutting down the Main Ring forever.

As the countdown begins, the 600-plus scientists who staff the fixed-target experiments are already reminiscing with a mix of regret and relief. Over the last year, they spent their days and nights in the experiments' portakamps; in halls as cavernous as airplane hangars; in corridors stuffed with computers and Gary Larsen cartoons or crammed with logic units whose tangled webs of wires relayed confusion.

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Restoring a Landmark

As age creeps up on Wilson Hall, engineers prepare for reconstructive surgery.

By Andrew Shih, Office of Public Affairs

August 4, 1997. Wilson Hall.

"...and on your left, just above the Laboratory site model, you'll see our newest educational display, 'The Effect of Building Movement on Structural Concrete.' Please note the crumbling concrete and exposed steel support rods...."

The Facilities Engineering Services Section probably didn't intend that their maintenance job would become another stop on Fermilab's fifteenth-floor tour. But yards of yellow tape and translucent plastic make the damaged area just as intriguing as the top quark display on the opposite wall.

This concrete damage provided a vivid example of the problems that plague Wilson Hall a quarter-century after its construction. With increasing frequency, deficiencies in the building's structure, windows and plumbing cause problems for its occupants. To halt this slow decay, FESS staffers have formulated a multi-part plan to effect permanent repairs by the turn of the century.

Photo by Reidar Hahn

Wilson Hall – a prairie landmark in need of repair.

A crumbling cathedral

Robert Rathbun Wilson Hall bears the stamp of its creative antecedent in both its soaring height and unique design. Before construction on the Main Ring began, Wilson took a helicopter ride and decided that "the building should be at least 200 feet tall, and taller if possible." Later, his interest in cathedrals led architects to model the Central Laboratory Building after Beauvais Cathedral in France. His vision led to "an architecturally splendid building," according to David Nevin, head of FESS.

Unfortunately, the great minds behind Wilson Hall's construction couldn't foresee the damage that decades of Midwestern weather would wreak. Blazing summers and bitter winters cause cycles of expansion and contraction that weaken joints between the two main towers and the crossover floors. The resultant stresses cause pieces of concrete to break away from the beams, weakening the structure and creating falling debris.

FESS has taken steps to minimize these problems and ensure that Wilson Hall is safe for occupants and visitors. At weak critical joints, such as those on the fifteenth floor, Laboratory staffers have bolted large steel brackets to the beams to enhance structural stability. Canvas "diapers" catch debris that would otherwise fall to the atrium floor. These measures, however, do nothing to stop the continuing damage to the building's structural integrity.

"If for some reason we never do the final repair, the permanent repair, we [will] have a continuing maintenance problem, and the concrete will continue to fall down," said Elaine McCluskey, Lead Structural Engineer.

Leaking pipes, leaking windows

Concrete joints aren't the only victims of old age at Wilson Hall. In 1996, a burst pipe in the northeast corner of the building sent a steady stream of water falling 70 feet to the atrium floor. This inadvertent waterfall, the third significant plumbing-related flood in the past three years, demonstrated spectacularly the need for major plumbing repair.

Flooding in the atrium isn't limited to pipe breaks, however. As many Lab staffers can attest, every heavy rain brings a trickle from the north windows, soaking the entrance mats and

Seasonal stresses on structural beams have exposed these steel support rods in the concrete.

demanding a wide berth. Over the decades, waterproofing on both the north and south glass has deteriorated, causing regular and unavoidable leaks.

The inconvenience of leaky windows accompanies a more serious, though less likely, problem. Although the architects who designed the High Rise intended for safety glass to be installed in the sloping north and south faces of the building, the final result employed lesser-quality glass. While safety glass shatters into tiny pebbles if broken, the current glass breaks into sharp fragments which might cause injury. The deficiency of the current glass became evident in 1993, when a falling piece of concrete (from a damaged joint) fell through the sloped glass above the cafeteria, startling employees in the area.

The Restoration Project

Clearly, tackling all of these problems will require a significant expenditure of both time and money from Fermilab. To efficiently and permanently solve Wilson Hall's persistent problems, FESS staffers have prepared a detailed plan outlining their repair strategy. After consulting with STS Consulting, Ltd., of Northbrook, Ill., and Rubinos & Mesia Engineers Inc. of Chicago, the Restoration Project was conceived.

"All these big high-rises downtown ... wouldn't put up with what we're putting up with," said Project Coordinator Steve Dixon.

FESS will replace the sloped glass at both ends of the building with safer, more waterproof panels. "We want to bring it back to a weathertight and safe condition," said Dixon. If breakage should occur, he added, "we want it to be like your car windshield, where it breaks into tiny pieces."

Indoor waterfalls and underused drinking fountains will become things of the past after Laboratory staff replace outdated plumbing and install a new drinking water system. After separating the drinking and bathroom water systems, FESS will install a filter and pump to purify the drinking water, hopefully eliminating the need for bottled water, said McCluskey.

While the plumbing and window repairs constitute significant investments of Lab resources, structural repairs rise high above them in both cost and inconvenience. All concrete joints on the west side of the building will be rebuilt to allow movement between the west tower and the crossover beams. Currently, the inability of the joints to slide causes concrete damage during seasonal expansion and contraction. Freeing the joints to move independently will stop this ongoing damage.

Reinforcing plates hold loose pieces of concrete in place.

Photos by Reidar Hahn

Falling concrete punctured this hole in a south-facing window.

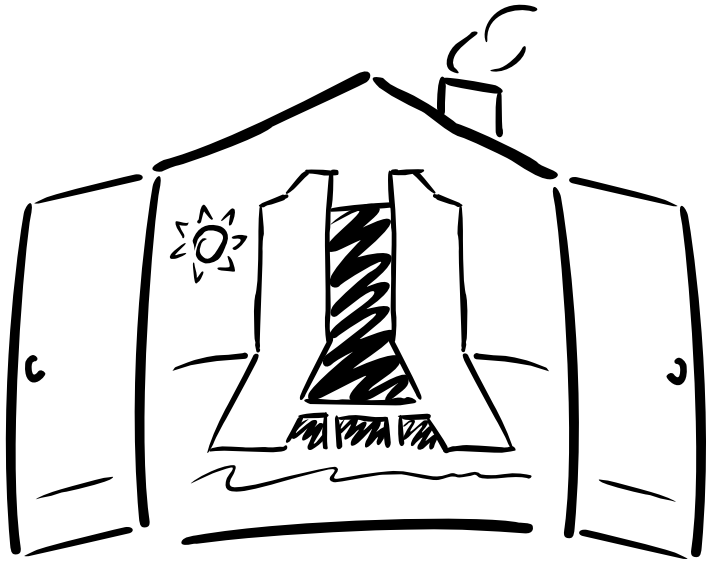
Unfortunately, during this repair, occupants of the crossover floors will be temporarily relocated to facilitate repairs. To minimize inconvenience to Lab employees, FESS plans to start from the first floor and move upwards, tackling window, plumbing, and structural repairs simultaneously at each level. By working on only a few floors at once and doing most of the work at night, FESS hopes to minimize disruption to Laboratory operations. "It won't be pleasant, but it will be the least unpleasant," said McCluskey.

Nevin added, "I know we know how to fix it, I know we can fix it.... The key here is to make sure that we do it in such a way that we bother the people who live here the very least."

Fermilab and the Department of Energy are still deciding on funding for the Restoration Project. FESS estimates a total project budget of $16 million, with initial design development beginning this fall and the final window put in place in January of 2001. Nevin summarized the importance of the project to the Lab:

"This building is the focal point of the activities that go on here at the laboratory; it's the landmark building. …We need to repair it and keep it in good shape," he said. "I think this building is gorgeous. I really do." ■

Fermilab Plans Open House



Organizers expect 10,000–20,000 visitors in September; guests will explore experimental areas not normally open to the general public.

by Donald Sena, Office of Public Affairs

Some communities have the neighborhood tavern, others the local bistro, while still others find neighbors congregating at ballfields watching their kids' games. And for one festive day in the late summer, members of the expanding Chicagoland community will gather at their local particle physics laboratory, coming to share in the neighborhood science.

The U.S. Department of Energy's Fermi National Accelerator Laboratory is hosting an Open House on Saturday, September 13, 1997, the Laboratory's first open house gathering since 1983. The event, which is free to the public, will take place rain or shine from 10:30 a.m. to 4 p.m. Visitors to the Open House will have the opportunity to tour areas of the Laboratory not normally open to the general public, including actual experiment halls and an accelerator tunnel. Fermilab is expecting 10,000–20,000 people for the special event. Bruce Chrisman, associate director of Fermilab, said the Laboratory, a fixture in the western suburbs, wanted to invite the surrounding community to learn more about the Lab's science endeavors.

"The Open House is a recognition that we in the sciences in general, and Fermilab in particular, need to do a better job of explaining to the public—the ones who pay for our work—what it is we do and why basic research is important to the nation," said Chrisman. "Although Fermilab is open every day to the general public, we haven't had an open house for a while, and we felt it was time to invite the community in for a special day."

A full day of activities

Fermilab Open House organizers have planned a full day for the guests. The Lab will offer three bus tours, each making stops at interesting sites along the way. A guest may ride a bus from start to finish without getting off, enjoying the scenery and listening to the tour guide explain the sights along the route. Visitors may also disembark at the tour stops for walking tours of experimental areas. For instance, Fermilab employees and guest scientists will lead tours of the Lab's two collider detectors, CDF and DZero, which physicists used to discover the top quark in 1995. At present, the two collider detectors are out of their collision halls and receiving critical upgrades for the next collider run, scheduled for 1999.

Visitors at the Open House also will have the opportunity to explore two fixed-target experiments, tour Fermilab's computing center and see a research and development facility where Fermilab employees are building sophisticated components for the collider detectors. Fermilab engineers will stage a cryogenics demonstration, introducing people to the science of extreme cold.

One of the highlights of the Open House will be a comprehensive tour of the accelerator complex; members of Fermilab's Beams Division will explain the numerous stages of the accelerator, giving guests a chance to see firsthand the most powerful particle accelerator in the world. The Beams Division will also take guests down into the Lab's newest accelerator, the Main Injector, which is now under construction.

Wilson Hall, the central laboratory building, will be a hub of activity during the Open House. Throughout the day, Fermilab scientists will give lectures that focus on the science of high-energy physics and quarks. More than 10 information booths staffed with Fermilab employees will introduce guests to many other projects and activities at the Laboratory, providing information on Fermilab's environmental restoration and management, literature on the arts series and displays on Laboratory safety measures. Fermilab also asks guests to bring any and all difficult science questions, as physicists will be on hand to try to answer them. Guests will also have access to the Leon Lederman Science Education Center and have the opportunity to hike through the restored tall-grass prairie.

Fermilab will offer a picnic lunch and snacks for a nominal price, and vans for the handicapped will be available. ■

Fermilab Photograph

Guests at Fermilab's last Open House in 1983.

DuPage County To Begin Road Study

By Judy Jackson, Office of Public Affairs

Officials of DuPage County recently announced that they will begin developing conceptual plans for a possible north-south traffic artery in western Dupage County. Part of the proposed route would pass through Fermilab.

On August 4, the Dupage County Transportation Committee approved a $102,765 contract with HNTB Architects, Engineers, Planners to provide engineering services for a "feasibility study," to investigate routes along both the east and west sides of the Fermilab property. The full County Board must still approve the Phase I project, but DuPage County Transportation engineer Charles Tokarski said he anticipated approval when the Board considers the issue in mid-August.

"A couple of Board members have said to me, 'Not only yes, but Hell, yes!'" Tokarski said.

Although the county is eager to provide a transportation corridor to promote development of its relatively undeveloped northwest section, county officials acknowledged the effects that such a route might have on Fermilab operations.

"While a north-south route would improve the county's transportation system," said Dupage County Board Chairman Gayle Franzen in a prepared statement, "we also appreciate the impact this expansion would have on Fermilab. Our hope is that we can develop a blueprint that satisfies both DuPage County and Fermilab."

County spokeswoman Julie Copeland agreed.

"DuPage County recognizes that building a road through the middle of Fermilab would disrupt Fermilab's scientific operations," she said. "The feasibility study will only investigate routes along Fermilab's east and west boundaries."

Officials of both the U.S. Department of Energy and Fermilab said that the decision to allow DuPage County to proceed with a feasibility study did not mean they had approved construction of a road through laboratory property.

Particles and Pavement

"I emphasize that the decision on whether such a road will be built has not yet been made," said Fermilab Director John Peoples Jr. "Because the Fermilab site is federal property, a decision on any such road will involve many factors, including environmental effects and the solicitation and consideration of community views on the proposal."

Fermilab has already begun gathering community input on the proposed route. Fermilab officials said they invite both Lab personnel and residents of neighboring communities to make their views on the proposal known to Fermilab's Public Affairs Office. Laboratory officials repeated their commitment to provide opportunities for all interested residents to be heard.

"The Department of Energy is committed to seeking the community's views on all major decisions affecting proposed land use at DOE facilities," said Cherri J. Langenfeld, DOE's Chicago Operations Office Manager. "We know a new north-south route is important to the people in this community and welcome their comments."

An eastern route for the proposed highway would pass just west of neighboring Summerlakes, a residential subdivision.

County officials estimated that the study might take six to nine months. Tokarski said he saw no sense in delaying the start of the study once the County Board has given its approval to proceed.

"We might as well get going and decide whether this is a project to proceed with or not to proceed with," Tokarski said.

From the point of view of Fermilab and DOE, the effect of the proposed route on the present and future ability of the Laboratory to carry out its mission of forefront particle physics research is of paramount concern.

"Fermilab has a critical decade of research ahead at the energy frontier," Peoples said. "We have already begun planning for potential future accelerators that would require the entire Fermilab site. We must make sure that we do not make any land-use decisions that might compromise Fermilab's ability to remain among world leaders in particle physics." ■

Photos by Reidar Hahn

Looking eastward toward the Fermilab boundary, one of the routes DuPage county will study for a proposed north-south traffic artery.

Searching for asymmetry in the universe:

The University of Virginia at Fermilab

by Katherine Arnold, Office of Public Affairs

The University of Virginia, nestled in the foothills of the Blue Ridge Mountains, grew out of Thomas Jefferson's idea to create an "academical village" where students and faculty could live and work side by side. Perched on top of a nearby hill is Jefferson's famous Monticello homestead, which overlooks Charlottesville and the university. Within this academical village is a course of study the founding father probably never fathomed—the search for the asymmetry between matter and antimatter in the universe.

Just as Jefferson worked with principles of symmetry in the architecture of UVa, physicists work to find symmetry in the Standard Model of Particle Interactions. However, the high-energy physics group at UVa exchanges the picturesque Virginia countryside for the portakamps and experiment halls of two Fermilab fixed-target experiments, searching for the asymmetry between matter and antimatter known as CP violation.

At a university known for its academic traditions, the 160-member physics department holds its own with about 40 professors and 80 graduate students. The high-energy physics group comprises four experimental physicists, five theorists and about 10 graduate students, as well as a number of research faculty and postdocs.

The group joined the ranks of university high-energy physics programs in 1988. Brad Cox, a UVa professor, was a Fermilab physicist at the time and joined the UVa faculty to organize UVa's particle physics efforts. The first experiment for the group was E771, a fixed-target experiment that focused on heavy-quark physics. Since then, the group has focused all of its attention on the search for CP violation, with involvement in the KTeV (E832) and HyperCP (E871) experiments at Fermilab and in the LHC-B detector study at CERN, the European Laboratory for Particle Physics.

Photo courtesy of UVa

The Rotunda, designed by Thomas Jefferson, is the landmark building at the University of Virginia.

HyperCP

In the HyperCP experiment, collaborators study the decay of the hyperon, a particle similar to a proton, and its antimatter counterpart, the antihyperon, to search for CP violation. Lambda hyperons consist of an up quark, a down quark and a strange quark. Ken Nelson, HyperCP physicist, UVa professor and one of seven UVa collaborators working at the experiment, said it's fairly easy to understand their challenge because they are working with a particle and an antiparticle.

"We're measuring something in the world versus measuring something in the

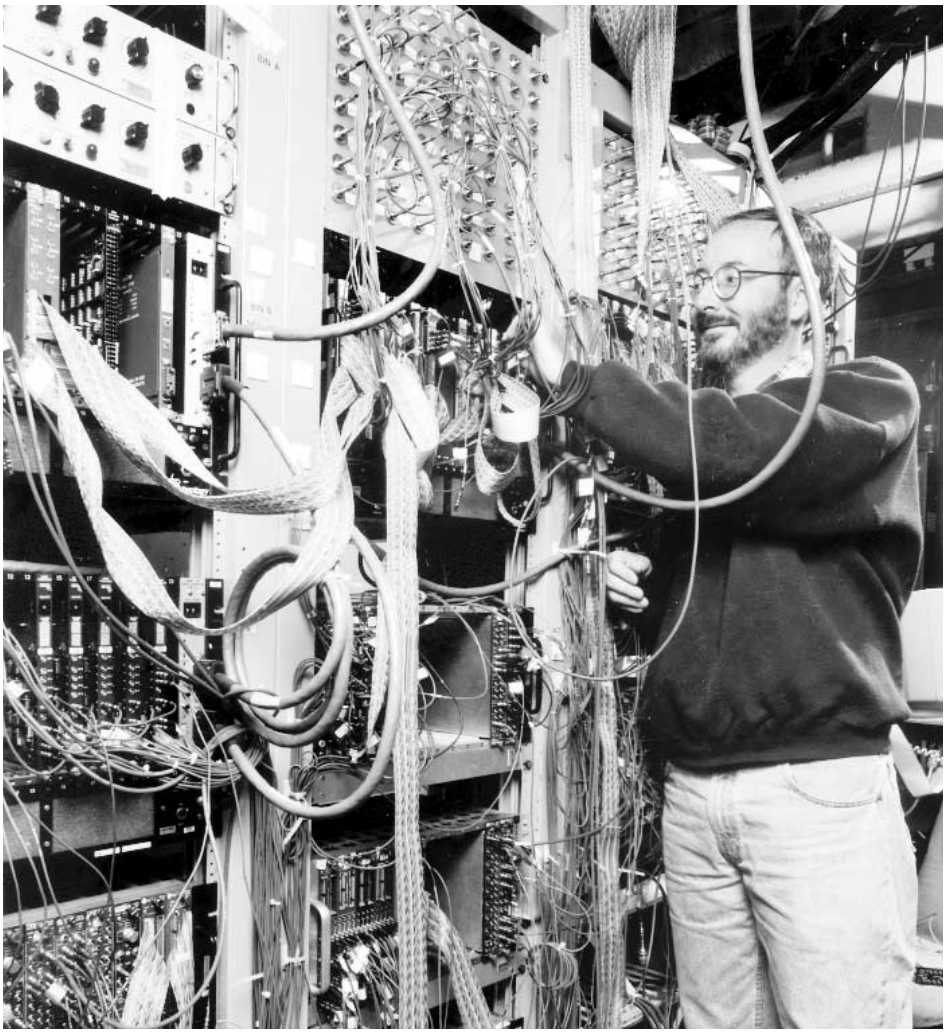


Photo by Reidar Hahn

Craig Dukes, HyperCP cospokesperson, works on the trigger at E871.

anti-world," said Craig Dukes, UVa professor and HyperCP cospokesperson. Asymmetry in the two decays, he said, will be evidence of direct CP violation. It will also be the first indication of CP violation in particles other than kaons.

Dukes worked on the original proposal for the experiment in spring 1993 while he was working at the Superconducting Super Collider. In June 1994 Fermilab approved the experiment for the current fixed-target run, and construction was soon under way. UVa built the wire chambers, the hadronic calorimeter, the trigger and the preamplifiers for E871. UVa also provided a cluster of four computers used to analyze the data. The experiment has recorded about 60 billion events since it began taking data in October 1996—an impressive turnaround time for such an ambitious experiment, Dukes said. He added that previous hyperon experiments helped pave the way for HyperCP.

"There is a long and distinguished list of hyperon experiments at Fermilab measuring magnetic moments of hyperons," he said. "This is almost a continuation of that set of experiments, but we had to build something completely new and capable of a much higher data acquisition rate."

KTeV

KTeV (Kaons at the Tevatron) is also conducting a CP violation search but with rare kaon decays. Ten collaborators from UVa are working on the experiment, and their major project has been the design and construction of a complex electron trigger. The group has also been very active in analyzing the data that KTeV has accumulated so far. John Adams, a UVa graduate student with no relation to another founding father, began working on the experiment last year and helped with UVa's contribution to KTeV's hardware and software. Now Adams works shifts and analyzes data, and said KTeV is a remarkable experiment because of the number of rare decays being studied. Cox, who leads the UVa effort at KTeV, is pleased with the data KTeV has taken so far.

"The search for direct CP and rare decays at the sensitivity level aimed at by KTeV is very ambitious, and KTeV is a challenging experiment," he said. "But the experiment is really going extremely well. Not only have we accumulated a great deal of data that will allow a very sensitive search for direct CP violation but a number of new kaon and hyperon modes have already been seen for the first time in the KTeV data."

The future for UVa HEP

In the future, the study of CP violation will continue as Virginia's main pursuit, Cox said. The UVa group pushed for a CP violation experiment at the SSC before its demise, and the group's efforts are gradually focusing on a CP violation search at the Large Hadron Collider, currently being built at CERN. The project, called LHC-B, will look for CP violation in *b* mesons.

"Interpretation in the *b* system is much clearer," Dukes said.

Closer to home, the group has goals of its own. Cox said UVa hopes to bring new faculty into the experimental program to continue studies at Fermilab as well as preparing for the LHC-B experiment. The vigorous experimental program is an advantage, Adams said.

"The program is fairly traditional, and they really want to make sure people are capable when they graduate from UVa," Adams said.

In the meantime, the UVa contingent continues its search for asymmetry between matter and antimatter.

"It is quite likely that only a combination of experimental results from kaon and *b* decays will pin down the true nature of CP violation," Cox said. "It will be a long process to obtain these results, but the physics is tremendously exciting and the work is rewarding."

A pursuit of knowledge that would no doubt make Thomas Jefferson proud. ■

Photo by Reidar Hahn

Casey Durandet, a UVa research scientist, adjusts fiber optic cables.

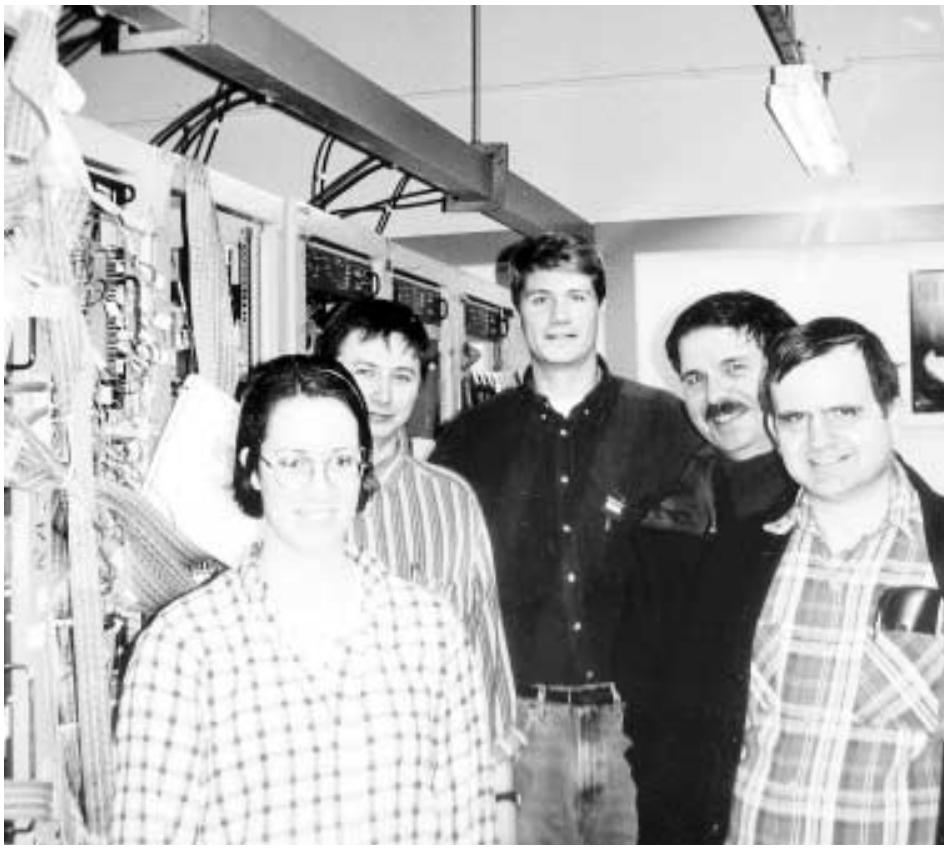


Photo courtesy of UVa

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

Fixed Target Finish

continued from page 1

They snacked on Twinkies during shifts. They anguished over failing chips and channels and over signals that hadn't yet materialized. They repaired, installed, replaced, fiddled, adjusted and tuned. They reported, finally, operations so smooth as to be, in the words of one experiment's spokesperson, "wonderfully dull." And they shared those sun-shot moments on shift when they first witnessed the high-intensity pings—the signals of a neutrino slipping through the detector, or of some other long-awaited particle.

It was, to hear the experimenters talk, a year when agony took turns with ecstasy.

With the ecstasy...

The ecstasy comes first to mind.

David Christian, E862 spokesperson, vividly recalls the excitement back in November when experimenters first observed the signal of an antihydrogen atom—and, with a tweak in the current rushing through the detector's magnets, two more atoms the very next day. He's expecting the computers to record 100 antihydrogen atoms by the run's end, and to beep him on his pager every time.

E866, which is peering inside the proton at the "sea" of quark-antiquark pairs buried in the nucleon, has already published preliminary results. With negligible statistical and systematic errors, experimenters measured the asymmetry of up and down antiquarks—the first such measurements in the world. Circumstantial evidence had hinted at an asymmetry in these two lightest antiquarks, and E866 found that, as previously suspected, anti-downs outnumber anti-ups. But contrary to expectations, they also found that the average velocity of these excess anti-down quarks is lower than physicists had guessed. The results have intrigued other research groups probing the detailed structure of the proton.

Still another success: E868, searching for signs of decay in antiprotons, achieved sensitivities of up to 1 million years for some decay modes—and, fortunately for the charge, parity, time reversal invariance theorem, still found no decay. According to the CPT theorem, antiparticles should behave no differently from their corresponding particles; in particular, the lifetime of an antiproton should be the same as that of a proton—greater than 10^{32} years. "For the time being, the CPT theorem is still safe," said Steve Geer, spokesperson for E868.

Finally, experiments lived up to their own lofty goals. With a more efficient detector than a previous experiment had used and with increased beam intensity, E831 manufactured, as planned, over a million fully reconstructed decays of charm particles. To put it another way, the experiment compiled more than a million states of matter combining one or more charm quarks with light quarks (the strange, up and down). It is the largest such inventory in the world, giving the experimenters a distinct advantage over other physicists studying charm—and a better chance of observing certain rare phenomena associated with the strong and electroweak forces.

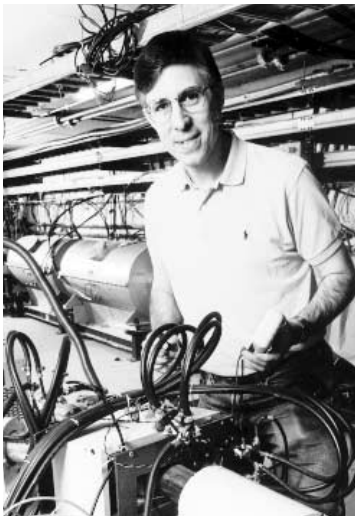
...the inevitable agony

Interleaved with the ecstasy of success were anxious moments, days or even weeks, as experimenters agonized over "infelicities" in the computer code, fretted over missing signals and overheating electronics, groaned when the air conditioning failed and when oil leaked into gas systems. While others cursed, though, Fermilab scientist Chuck Brown, on E866, enjoyed the "romance" of it all—even the "balky circuits that amaze, confound and amuse."

He did have one scare, though. Early in the run, E866's "large analysis magnet tripped off at full current, causing a radioactive beam absorber plug to shift position." Fortunately, the magnet and beam plug suffered no permanent damage.

Over at E871, the 20,000 wires in the wire chambers were always breaking. E871 is looking for evidence of CP violation—that tiny flaw in nature's mirror that has bequeathed us more matter than antimatter—by comparing the decay parameters of hyperons and antihyperons, particles similar to protons. Even with the problem wires and a late start, E871 still recorded about 60 billion events to tape, said Craig Dukes, cospokesperson for E871.

Electronics also bedeviled KTeV (E799/E832), an experiment bent on measuring a new parameter of CP violation in the decay of kaon particles. According to Bruce Winstein and Taku Yamanaka, cospokespersons for KTeV, researchers had to replace several channels in the calorimeter every day, bringing down the beam each time, then bringing it back up again—a laborious, time-consuming task. Given the complexity of this new experiment, said Winstein, many people had expected only an "engineering run" to tune the new kaon beam and iron out kinks in the detector. Instead, only two months into the run, the experiment was collecting near-perfect data—thanks to equipment that remained



E862: Spokesman Dave Christian stands beside the particle detector in the antiproton source.

Photos by Reidar Hahn

E799/E832: Amitabh Lath, from Rutgers University, checks phototubes on the regenerator.

faithful to design specifications. The experimenters have already submitted one paper to Physical Review Letters.

At the outset, E781 scientists were wondering whether their experiment was working at all. In designing their search for charm, said spokesperson Jim Russ, they had carefully simulated the number of particles that would be detected, but when the beam turned on, they got twice as many hits as predicted. That meant twice as many events to be recorded, requiring twice as much computer space to store the information. Finally in April, the experimenters figured out how to handle the data overload—and figured out, too, that they hadn't "messed up," said Russ. In the end, the spectacular resolution in mass and time parameters amazed everyone.

Yet to come

For E781 and other experiments, the analysis will begin, if it hasn't already, when the beam shuts down.

In the raft of data collected over the last year, for example, E872 will search for the tau neutrino—the only one of the fundamental particles in the Standard Model that still has not been directly observed.

E835 will study its sample of charmonium, a form of matter containing charm and anti-charm quarks, for insights into the strong interactions binding quarks—and meanwhile, hope for "fame and glory," quipped collaborator Stephen Pordes.

Bob Bernstein, E815 cospokesperson, expects two more years before experimenters will be able to tell whether their measurement of a certain parameter (called rho) in the Standard Model is equal to one, as the model assumes, or in fact holds some different value—in which case the model itself will need to be corrected.

Many experimenters, then, look forward with anticipation, but backward with mixed emotions.

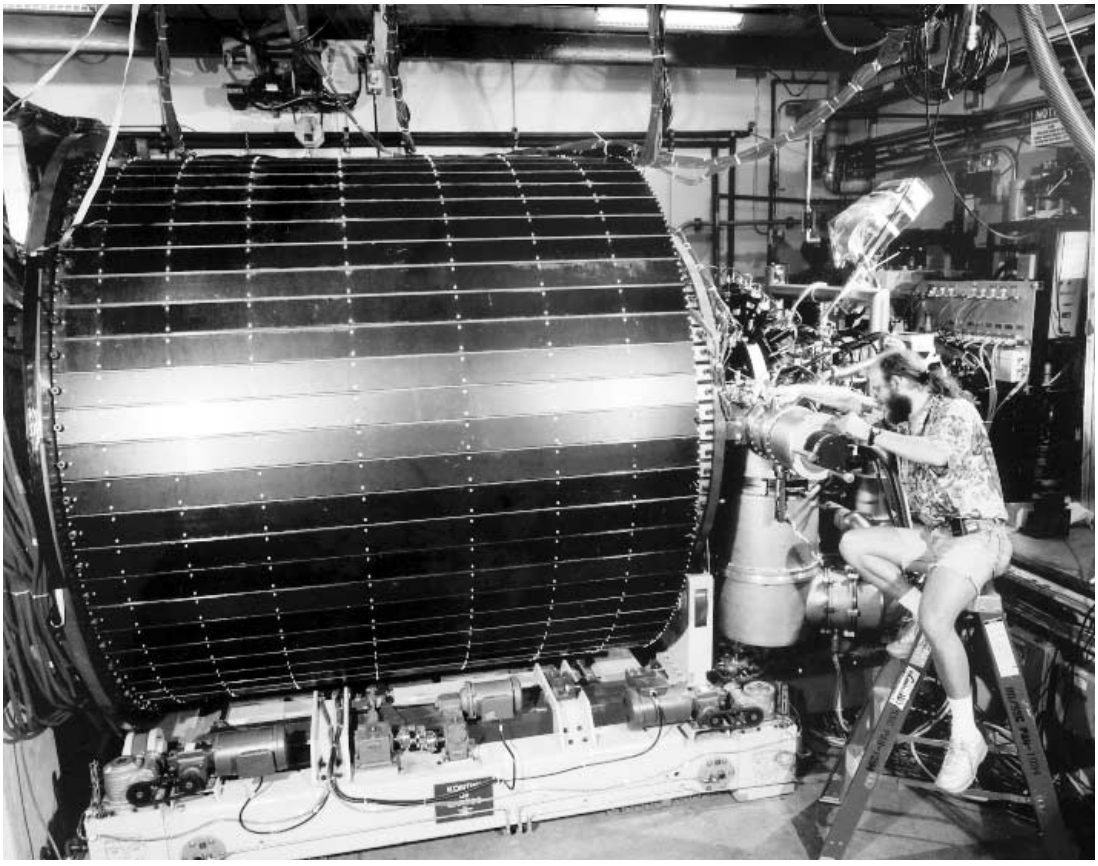
Echoing the feelings of others, E831 cospokesperson John Cumulat said, "The thought of turning off all the equipment is very depressing"—especially after such an "enormous effort" by so many talented researchers to keep the detectors running at peak performance.

The experimenters remember the wonderful camaraderie among the collaborators, who converged here from all parts of the globe, and the daily strain of keeping equipment in line.

And while sad and wistful, the experimenters are also relieved. When the beam turns off, and they no longer need agonize over system failures or marvel at a clean, clear signal, they will finally manage a night of uninterrupted sleep. ■

E872: Vittorio Paolone (kneeling), from the University of Pittsburgh, and Fermilab scientist Byron Lundberg make repairs in the counting room.

E781: Fermilab physicist Joe Lach works on a hyperon channel.



Photos by Reidar Hahn

E835: Roberto Mussa, from the University of Ferrara, Italy, makes adjustments in the detector.

Grannis Receives DOE Leadership Award

Photo by Reidar Hahn

Physicist Paul Grannis announced the discovery of the top quark at a Fermilab Colloquium in 1995.

United States
Department of Energy

Appreciation Plaque

Presented to

Professor Paul D. Grannis

In recognition of your exceptional leadership of the D-Zero collaboration from its inception in 1983 through 1996. It was in large measure through your dedicated efforts that D-Zero became the world-class collaboration and detector that it is today — a collaboration that in 1995 shared in the discovery of the top quark at the Fermi National Accelerator Laboratory.

Martha A. Krebs
Director
Office of Energy Research
July 1997

By John Womersly, DZero Collaboration

He would rather have received $10 million for upgrading the detector, joked former DZero spokesman Paul Grannis, but he nonetheless accepted a special award from the U.S. Department of Energy with "tremendous gratification." Grannis received the award, for exceptional leadership, on July 23, in recognition of his 13 years as spokesman of the DZero experiment at Fermilab's Tevatron Collider. Starting in 1983, Grannis, a professor of physics at the State University of New York at Stony Brook, shepherded DZero through detector design, construction, commissioning and operation. He eventually shared in the 1995 discovery of the top quark.

Associate Director for High-Energy and Nuclear Physics Peter Rosen presented the award, signed by Director of Energy Research Martha Krebs. Rosen made the presentation during a special session of the DZero collaboration's annual workshop, held this year at Indiana University in Bloomington. In his remarks, Rosen outlined the status of this year's high-energy physics funding and reminded the audience that DOE is a major science funding agency, a role he said is not widely appreciated.

Rosen said he is "very excited" by the prospects for physics at Fermilab starting with the turn-on of the Main Injector in 1999. Precision measurements of top quark and *W* boson masses by the collider detectors can constrain the mass of the as-yet-undiscovered Higgs particle: if its mass is low enough, researchers may even find it at the Tevatron. Supersymmetric particles, popular among theorists as extensions of the Standard Model, may also be detectable.

"I would like to be greedy and find all of these things," Rosen said.

Rosen described Grannis's pivotal role in creating the DZero experiment and singled out his efforts to make the collaboration international as pointing the way forward for high-energy physics in the era of the Large Hadron Collider at CERN.

In accepting the award, Grannis expressed chagrin at being recognized for the achievements of hundreds of his DZero colleagues. He stressed his acceptance of the award on behalf of the whole collaboration. He then pointed to 13 incidents in the history of the experiment—one for each year he spent as spokesman—that stood out in his mind. He described the then-radical choice of uranium and liquid argon as the basic energy-measurement technology in 1983, and the choice of a name for the detector—"one of the hardest things we did, and one of the things we did most poorly!" He recounted trials and successes in building, assembling and upgrading the detector; observation of the first proton-antiproton collisions in 1992; the top quark discovery in 1995.

Grannis concluded by describing DZero's "world-class physics program of today," including a four-percent measurement of the mass of the top quark—"a particle we didn't even know existed two years ago"—the most precise measurement of the mass of the *W* boson, the best limits on masses of super-symmetric particles and the best limits on production of the hypothetical leptoquark particle.

The former spokesman cited his pleasure in seeing the younger members of the experiment, who joined as students or post-docs, come of age as physicists to the point where "they are now telling us old guys how to do physics." He noted the collaboration's vitality, cooperative spirit, excellent leadership and prospects for the future. He closed by thanking DOE and the National Science Foundation for their guidance and support. Following the ceremony, the 140 DZero collaborators meeting in Bloomington went back to work on the workshop's goal of preparing for Run II at the Tevatron. ■

Visiting firemen with a hook and ladder truck from neighboring Batavia. The fire buffs also got a look at firefighting equipment at Fermilab, which has a cooperative firefighting agreement with Batavia and other nearby communities.

Fire Buffs Visit Fermilab

By Jeffery D. Schielke, Mayor of Batavia

A stop at Fermilab's fire station was on the agenda for a group of 30 visiting firemen who toured suburban firehouses on July 17 during the International Fire Buff's Convention, held in downtown Chicago July 16-19.

Among the fire fighters who stopped to see the Lab's fire station and take pictures of its equipment were visitors from such east coast towns as Boston, Baltimore, New York, City, Philadelphia, Hartford and Nashua, New Hampshire.

The group reported that they were especially pleased to be invited by Fermilab Fire Chief Jack Steinhoff to review the Lab's fire fighting operations, given the specialized equipment and procedures used on the site. Several members of the group also expressed appreciation for the opportunity to catch a firsthand look at the Lab's landscape and unique site layout.

Other fire departments featured in the day-long tour were Downers Grove, Westmont, Darien-Woodridge, North Aurora, Mooseheart and Batavia. Fermilab Fire Department Captain George Reichhardt assisted Steinhoff in coordinating and planning the visit. ■

CALENDAR

August 16

Art Series presents: *David Grisman Quintet,* Ramsey Auditorium at 8 p.m. Admission $21. For more information or to purchase tickets call (630) 840-2787.

AUGUST 22

International Film Society Presents *The White Balloon*; Dir: Jafar Panachi, Iran (1995). Admission $4, in Ramsey Auditorium at 8 p.m.

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.

LETTERS TO THE EDITOR

(Note: Some letters have been edited for space considerations.)

This past year I've been studying physics – mainly quantum physics – and became very intrigued with this branch of science. Of all the physics books I've read, there's always a mention of the famous Fermi accelerator. Could I please obtain some literature [about] the facility [and] how it operates? I'm very eager to probe into the depths of the cosmic code.

Sincerely,
G. Vallejo, Pelican Bay Penitentiary,
Crescent City, CA

I have found it inconvenient for newcomers to send personal letters after the mail office moved to its new address; the stamp machine is still in the High Rise, but there is no mail box there. A mail box beside the stamp machine would convenience most like me, and I think it would make Fermilab more lovable.

Best wishes,
X. Bai, Pierre Auger Project Visitor

I write to you for two reasons. First, I think an Eola Road expressway jeopardizes the future of our Fermilab, both as a research facility and as a wilderness. My second reason for writing is to urge, to "issue a call" to, my Fermilab colleagues to collaboratively voice concern publicly over the site-dividing thoroughfare. All of us at Fermilab need to write our community leaders to express concern over the proposed expressway. I know I share the love with most of you for our Laboratory; it's enriched our personal lives as well as our communities. Would we do anything less than attempt to protect from peril something so important to all of us?

Alan D. Long, Support Services

Editor's note:
See story on the road issue, page 5.

Chez Léon

MENU

Lunch served from
11:30 a.m. to 1 p.m.
$8/person
Dinner served at 7 p.m.
$20/person

For reservations, call x4512
Cakes for Special Occasions
Dietary Restrictions
Contact Tita, x3524

Lunch
Wednesday
August 20

Closed

Dinner
Thursday
August 21

Closed

Lunch
Wednesday
August 27

Pork Loin w/Peanut Sauce
in Pita Bread
Summer Garden
Couscous Salad
Melon and Blueberry Coupe
with White Wine,
Vanilla and Mint

Dinner
Thursday
August 28

Roasted Garlic and
Yellow Pepper Soup
Grilled Tuna with
Summer Vegetables
Corn and Black Bean Salad
Cinnamon Crunch Shortcake
with Berries

CLASSIFIEDS

FOR SALE

■ '90 Toyota Tercel, 2-doors, manual 5-speed, only 70K miles, A/C, AM/FM, very good condition. Asking $4000 obo. Call Tony, x3664, or riotto@fnas01.fnal.gov.

■ '89 Ford E-150 Conversion Van V8, p/s, p/w, pdl, 4 captains chairs, center table, fold-down rear seat, tinted glass, privacy/sun shades, CB, AM/FM cassette stereo, a/c, tilt wheel, cruise control, $3800. Call Jim, x4076 or (630) 208–9131.

■ '89 Corvette, black sapphire (color) w/tan leather interior, 38K miles, extra clean, garage kept, driven weekends only, $16,500. Contact Bert, x4775 or bertrum@fnal.gov.

■ '86 Toyota Celica GT hatchback, black, 5 spd, am/fm/cass, sunroof, A/C, 110K, $3500/BO. Great car! Moving sale—too much to mention everything: round table, desk, drafting table, 4 chairs, 2 papasaan chairs, rocking chair, bar stool, lamps, shelves, stereo TV, IBM computer, rugs, kitchen stuff and mountain bikes. Everything must go! Please call x8195 or (630) 416–8192 or write szapudi@traviata.fnal.gov.

■ Six-piece living room set, $250, includes: 90" gold/brown couch, 2 blue chairs, 2 end tables and coffee table. Queen-size waterbed, $200, 4-drawer wooden pedestal w/bookshelf headboard, heater & motionless bag. Horizontal blind, $25, in dove gray, fits sliding glass patio doors. Please call (630) 879–6381 after 7 pm.

■ GE gas stove, Profile series, stainless steel, natural gas and LP gas jets, self-cleaning oven, sealed burners. Paid $1350 in Oct '96; asking $1100, used for a few hours. Will deliver if reasonable distance from lab. Kenwood multi-component stereo system w/cabinet. Includes linear tracking turn table, amplifier KA-94, synthesizer AM/FM tuner KT-54 (memory holds 14 AM and 14 FM stations), graphic equalizer GE-34, dual-deck cassette recorder KW-64W, CD player DP-840, 2 4-way 150-watt speakers JL-840. $2000 obo. 16 ft. fiberglass DuoMarine boat needs work, hardware removed, rough sanding completed, $100 obo, includes trailer. Call Terry, x4572, or e-mail skweres@fnal.gov.

■ Warrenville, $152,900, 5 min. from Fermilab. Cedar-sided 2 story; completely remodeled: 2 BR; 2 bath; c.a.c.; h/w floors; ceramic entry, kitchen, baths; brand-name fixtures & appliances; dry basement. Lg. wraparound deck, balcony. 2.5 car heated attached garage, 200 amp. wired for workshop. Paved driveway. Lg. treed corner lot (183' x 70') w/partial fence. 393-4521.

■ 1 Hummel figure, boy w/fiddle, about 3" tall, $125. One pair Hummel candle holders, about 6" tall, $150. Call Marion x2727 or e-mail mhr98@fnal.gov.

■ 2 hand-raised cockatiels, approx. 1 yr. old, very tame, $30 each, will separate; cage available. Antique formal mahogany beveled mirror w/shelf and scrollwork, $250. '78 Lincoln Mark V, white, Florida car, stored winters, great CD stereo, excellent condition, $3900. Call x3230, (630) 761-8386.

FOR RENT

■ Apartment-sublet 1 bdrm in a 2-bdrm apartment either fall (Sep-Dec) or fall & spring (Sep-May) $360/mo. furnished, heat included. Naperville, on Rte. 59 south of I-88. Close to lab, approx. six miles/15 minutes. Walking distance to Route 59 train station and golf course. Near Fox Valley shopping mall. Nice place; AC, microwave, dishwasher, new carpet and paint. Complex has pool, sand volleyball court, lighted tennis court, and free bagels every morning! Call Andy, (630) 428-2310, evenings, or write apaullin@fnal.gov.

■ Sublet: Sept 1- Oct 31, 1 bedroom apartment, undermarket price! $659/mo including utilities, except electricity & phone. Great location, close to 88 on 59, 10 minutes from Lab, 35 minutes from Chicago. Amenities include swimming pool, tennis, basketball and volleyball courts, dishwasher, A/C, club room, etc. Please call x8195 or (630) 416–8192 or write szapudi@traviata.fnal.gov.

■ Available now, 2-bedroom apartment. Includes garage, large yard, quiet street, all new, 10 minutes from Wilson Hall. Contact Alan Baumbaugh x4044, 851-4829, or Baumbaugh@fnal.gov.

LAB NOTES

DEER STATISTICS

The Environmental Protection Group is trying to get accurate statistics on the number of vehicle accidents involving deer. The staff is collecting information on the nature of such accidents, whether any deer or people were injured and how much physical damage occurred. Please report any incidents, however minor, to Doug Arends, X4847 or arends@fnal.gov.

ENVIRONMENT CONSORTIUM

On June 13, the Chicago Region Biodiversity Council accepted Fermilab as a member of Chicago Wilderness, a consortium of 34 regional organizations supporting environmental research, restoration and management.

MILESTONES

HONORED

Sergei Denisov, DZero collaborator from Moscow State University, elected in May as Correspondent Member of the Russian Academy of Science. "It is a rather honorable position in Russia," says Denisov's son, Dmitri, a Fermilab physicist and also a DZero member. "Around a few hundred of the best scientists in Russia, in all areas from literature to political science, form the Russian Academy of Science. This year, only three members out of more than 70 candidates were selected, and Sergei was one of them. There are newspaper articles in many Russian newspapers about Sergei."

RETIRED

The IBM 4381 computer system, on Tuesday, August 5. It served the Fermilab community for over 15 years, supporting payroll, human resources, material management and many other functions.

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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.

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