FermiNews

Fermi National Accelerator Laboratory

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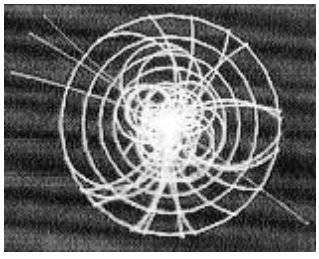
U.S. and CERN Sign LHC Agreement

American scientists, including many from Fermilab, will help build the Large Hadron Collider in Europe.



CERN Photo

Simulation of a Higgs boson decay.

By Judy Jackson, Office of Public Affairs

As they cleared security at the entrance to the Old Executive Office Building across the street from the White House, guests and dignitaries bound for the December 8 signing ceremony for the Large Hadron Collider donned mandatory plastic ID tags stamped with the words "Large Event." Looking around at the tags adorning the veritable Who's Who of U.S. particle physics and Washington science hands filling the ornate Indian Treaty Room, CERN Director-General Chris Llewellyn Smith posed a question.

"By 'Large Event,'" he wondered, "do you think they mean the Higgs?"

Whether or not the new Large Hadron Collider to be built at CERN, the European Laboratory for Particle Physics in Geneva, ultimately identifies an event containing the putative mass-conferring particle called the Higgs boson, the ceremony confirming U.S. participation in the project was definitely a Large Event.

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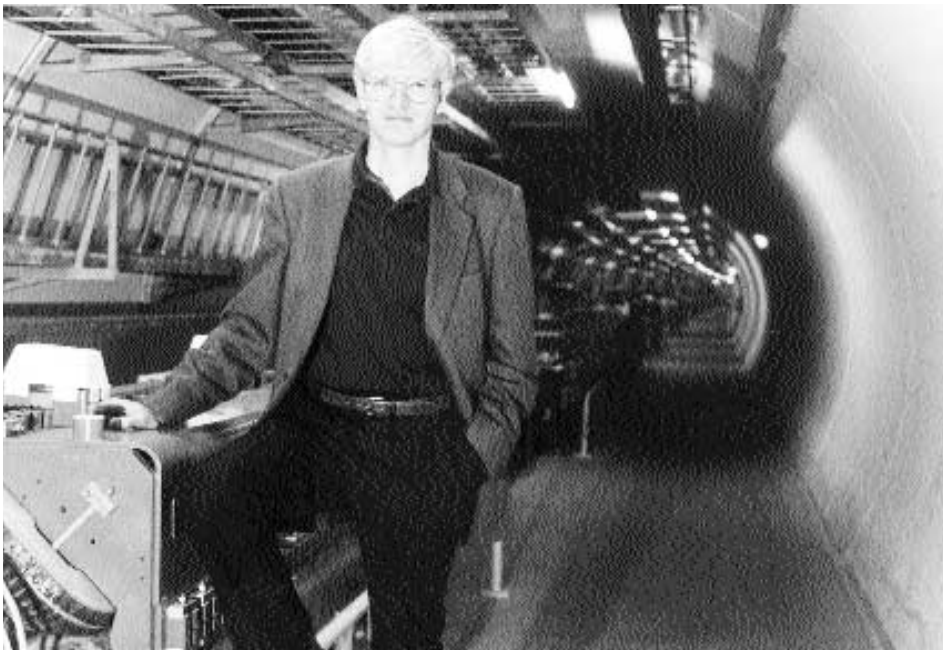
DOE Photo

NSF Director Neal Lane, Secretary of Energy Federico Peña, CERN Council President Luciano Maiani and CERN Director-General Chris Llewellyn Smith immediately after signing the LHC agreement in the Indian Treaty Room.



CERN Photo

CERN's Director-General Christopher Llewellyn Smith in the tunnel that will hold the LHC.

" American participation in the Large Hadron Collider will inject a wealth of scientific experience, excellence and characteristic exuberance into the project."

~ Christopher Llewellyn Smith

LHC Signing

continued from page 1

An unprecedented partnership

In what they all described as an historic act of international scientific collaboration, U.S. Secretary of Energy Federico Peña, National Science Foundation Director Neal Lane, CERN Council President Luciano Maiani and Llewellyn Smith signed an agreement under which the U.S. will help build the new accelerator and two of its associated detectors. When it begins operating sometime after the year 2005, the LHC will take over the energy frontier from Fermilab's Tevatron, currently the world's highest-energy particle accelerator.

Although international collaboration has long been a hallmark of particle physics, with scientists from many nations getting together to build detectors and operate experiments, the new agreement calls for unprecedented worldwide partnership in the construction of an accelerator itself, traditionally the responsibility of the host country.

"When we sign this agreement," Peña said, "it will mark the first time the U.S. government has agreed to contribute significantly to the construction, through domestically produced-hardware and technical resources, of an accelerator outside of our borders."

Besides CERN's 19 European member states, which for over 40 years have chipped in to build and operate the high-energy physics facilities at the laboratory, several non-member states—including the U.S., Canada, Japan, India and Israel—have agreed to contribute to the new LHC collider and detectors. The U.S. contribution, largely in the form of accelerator and detector components built in the U.S. to be delivered to CERN, will total $531 million over eight years, with $450 million coming from the Department of Energy and the remaining $81 million from NSF. In fiscal year 1998, Congress appropriated $35 million for LHC work. When experiments begin in another decade, about 25 percent of American experimental particle physicists say they plan to collaborate on experiments at the LHC.

Physics without borders

Llewellyn Smith cited the universality and openness of science as a reason that scientific research should be carried out in international collaborations, not hemmed in by borders or cultures.

"The signature today of the cooperation agreement between the United States of America and CERN is an historic event," he said. "It is an important step towards the first-ever global collaboration in a large scientific construction project. American participation in the Large Hadron Collider will inject a wealth of scientific experience, excellence and characteristic exuberance into the project."

The LHC, whose total price tag will equal about $6 billion, will occupy an existing 16-mile tunnel that currently holds the Large Electron-Positron Collider. The LHC's collision energy of 14 TeV will be seven times higher than that currently achieved at the Tevatron. Its energy will reach a scale at which physicists believe they may find the answers to fundamental questions about the origins of particle mass. They hope the LHC may also offer a pathway to physics beyond the well-worn Standard Model, the current theoretical picture of particle interactions.

Fermilab, the LHC and the future

U.S. participation in the LHC will have important consequences for Fermilab. The Technical Division's Jim Strait is the project manager for the U.S. contribution to the accelerator, leading a collaboration that includes Brookhaven, Lawrence Berkeley and Fermilab. Much of the R&D and fabrication for advanced superconducting quadrupole magnets for the accelerator's interaction regions will take place in Fermilab's Technical Division.

In addition, in 1997, officials of DOE and NSF asked Fermilab to oversee project management for the CMS detector, one of the LHC's two major detectors. Fermilab is the host laboratory for U.S. CMS, for which Fermilab physicist Dan Green is technical director.

"Physics is a discipline without national borders," Green said. "Since the possibility of basic discoveries in particle physics is large at

CERN Photo

Computer simulation of the LHC as it will appear in the tunnel that currently houses CERN's Large Electron-Positron Collider.

the energy frontier, it is vitally important that U.S. physicists have the opportunity to participate as full partners in the LHC adventure. The recent agreement between CERN and the U.S. ensures that partnership."

Although it might seem puzzling that Fermilab would welcome the opportunity to help build the accelerator that will one day supersede the Tevatron, Laboratory scientists hailed the signing ceremony as a landmark in international cooperation that will benefit not only particle physics research but Fermilab itself.

"Collaborating with CERN on LHC is good for Fermilab because it is good for science," Strait said. "The science of LHC is compelling, and we can help ensure that it is done more quickly, through our work on the accelerator, and better, through our work on CMS. Our work on LHC keeps Fermilab and the U.S. high-energy physics community deeply involved in the physics at the energy frontier, and our work on the detector and accelerator will help keep our technological abilities at the forefront. This will help make us a credible host for the construction of a future higher-energy collider. The only way such large facilities can be built is by worldwide collaboration, and our contribution to the construction of the LHC will help establish the principle and habit of accelerator builders working together across international boundaries."

However, the path to a future U.S. accelerator is by no means certain. Although they repeatedly cited the LHC agreement as an excellent precedent in global collaboration and a model for other fields, both European and U.S. officials were careful to avoid establishing any *quid pro quo* for future accelerator construction. In response to a reporter's question whether Europe is now committed to support U.S. high-energy physics facilities in the future,

continued on page 11

Photo by Fred Ullrich

At Fermilab's Technical Division, Fermilab engineer Jim Kerby explains the progress of work on high-gradient LHC quadrupole #1 to CERN's Win Middelkoop and Lyn Evans, and Brookhaven's Mike Harrison. U.S. LHC accelerator Project Manager Jim Strait looks on.

Photo by Reidar Hahn

Purdue University physicist Sergei Medved works on a piece of a piece of the CMS detector in Fermilab's Lab 7.

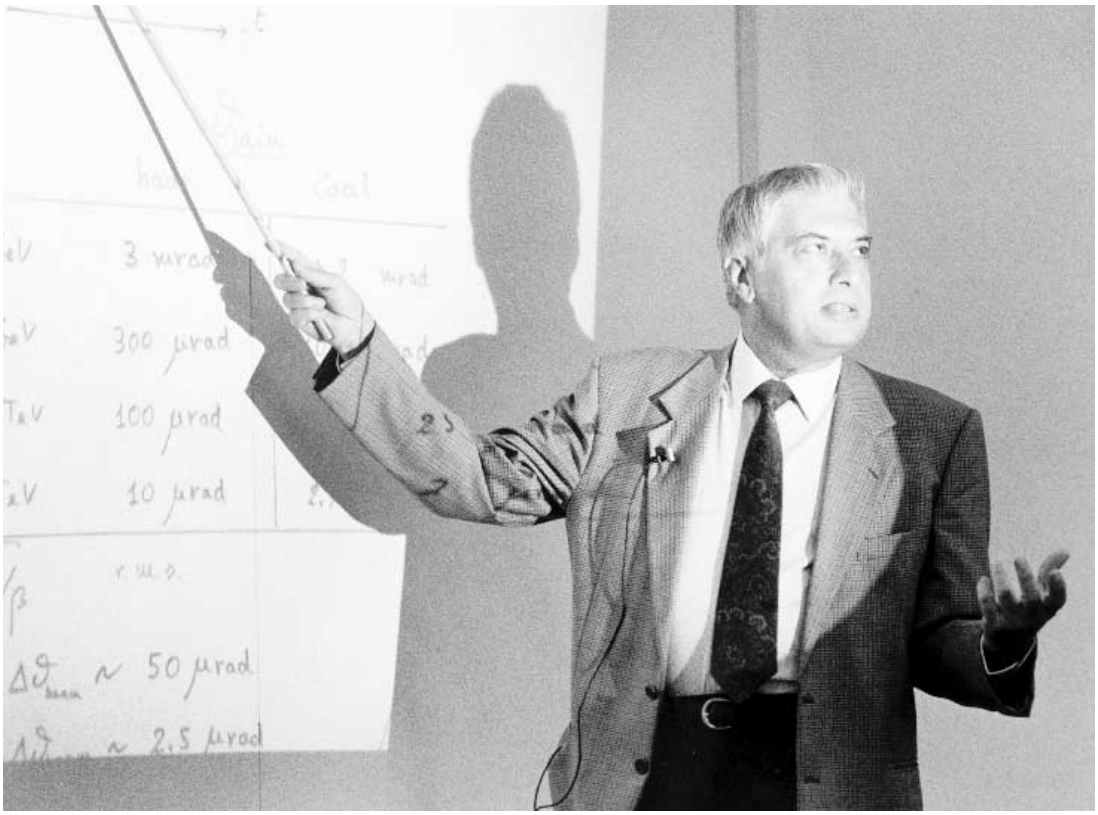


Photo by Reidar Hahn

George Matthiae, of the University of Rome, was a pioneer in the development of the Roman pot, one of the first devices to be used in detecting events near circulating beams.

A recent symposium brought together accelerator experts and experimenters to start talking about

Near-Beam Physics

by Sharon Butler, Office of Public Affairs

Close to the beam lie physical events that scientists are eager to probe—like events involving *b* quarks and the bound states of *b* quarks and antiquarks called *B* mesons. Here, scientists are exploring a fundamental question: why the universe holds more matter than antimatter.

Close to the beam, too, physicists also explore the collisions of proton and antiprotons slightly nudged out of line, as little pieces of protons called pomerons bump into quarks and gluons.

But cozying up to the beam can be hazardous. Stick a precious silicon vertex detector too close and it might just get blasted, suffering irreversible radiation damage. For the beam comes on with "the energy of a Mack truck," said physicist Dick Carrigan.

That's why he and his Fermilab colleague Nikolai Mokhov organized a symposium last September on what they called "near-beam physics"—to get accelerator specialists talking with high-energy physicists. As Carrigan noted, "you need a certain kind of beam to do this kind of physics."

Close by

Carrigan says that the term "near-beam physics" was just a phrase the organizers of the symposium "pulled out of a hat." It refers to the domain of high-energy physics experiments where particle detectors work only fractions of an inch from a circulating accelerator beam.

In recent years, the pursuit of this kind of physics took off when silicon vertex detectors were introduced. With a particle beam shooting by only an inch or so from these detectors, physicists have been able to measure the displaced vertex associated with *b* quark decays.

"People got more and more interested in seeing how close to the beam they could get," said Carrigan. "Instead of something the size of a paper towel roller [wrapped around the beam], they wanted something the size of a pen."

A number of devices now exist for probing near-beam physics, all of them daring to get close to the beam. One popular device is the Roman pot, whose pioneer, Giorgio Matthiae, of the University of Rome, gave the introduction to the three-day symposium. The Roman pot, which could be mistaken for a

" Near-beam" refers to the domain of high-energy physics experiments where particle detectors work only fractions of an inch from a circulating accelerator beam.

Photo by Reidar Hahn

Fermilab physicists Andrew Brandt and Michael Albrow are proponents of the Roman pot, a device used for hard diffraction studies close to the beam.

shiny stainless-steel flower pot, is controlled remotely, moving in on accordion-like bellows that retain a vacuum. Inside the pot sits a small scintillating fiber or silicon detector. Once the beam stabilizes, the Roman pot can get as close as four to eight beam diameters (about the size of a pencil lead) from the beam axis, according to speakers at the symposium.

Other devices operating close to the beam include crystal and wire targets, which are positioned closer still, at 3 to 4 beam diameters.

A wire target is used in HERA-B, the *B*-physics experiment at DESY (the Deutsches Elektronen Synchrotron in Germany). DESY physicists Carsten Hast Klaus Ehret and Michael Bieler reported on the status of that experiment.

Crystals are used in extracting beams from an accelerator—for fixed-target experiments, for example. Speakers from IHEP (the Institute for High-Energy Physics in Russia), CERN (the European Laboratory for Particle Physics) and Fermilab reviewed extraction, including pioneering work using crystals.

Taming the beam

One problem for physicists probing events astride the beam is the "beam halo," a cloud of particles around the beam—"little outriders," Carrigan called these wayward particles, "like flies following a cow around." They get in the way of experiments, causing background noise and, worse, crashing into delicate detector components and damaging them forever.

There is as yet "no nice theoretical underpinning to predict this phenomenon," says Carrigan, "no tidy theory using nonlinear beam dynamics."

Near-beam physics experiments need a minimum halo so that the beam is clean and detectors can move in as close as possible. One method of trimming the halo is to use collimators, which block the path of the irritating flies. Experimental and theoretical work on collimation has illuminated aspects of this halo phenomenon, and reports on these studies were included in the symposium.

Near-beam physics also requires that the beam be closely monitored and its orbit corrected and stabilized, and Fermilab staff Alan Hahn and Vladimir Shiltzev discussed the special instrumentation that keeps the Tevatron's beam on track. ■

From left to right: Weiren Chou, of Fermilab, Bernard Jeanneret and Walter Scandale, of CERN, and Mario Macri, of the University of Genoa, discuss issues in near-beam physics.

Photo by Reidar Hahn

"Dear Mr. Ellis...."

How do you use mathematics in your work?

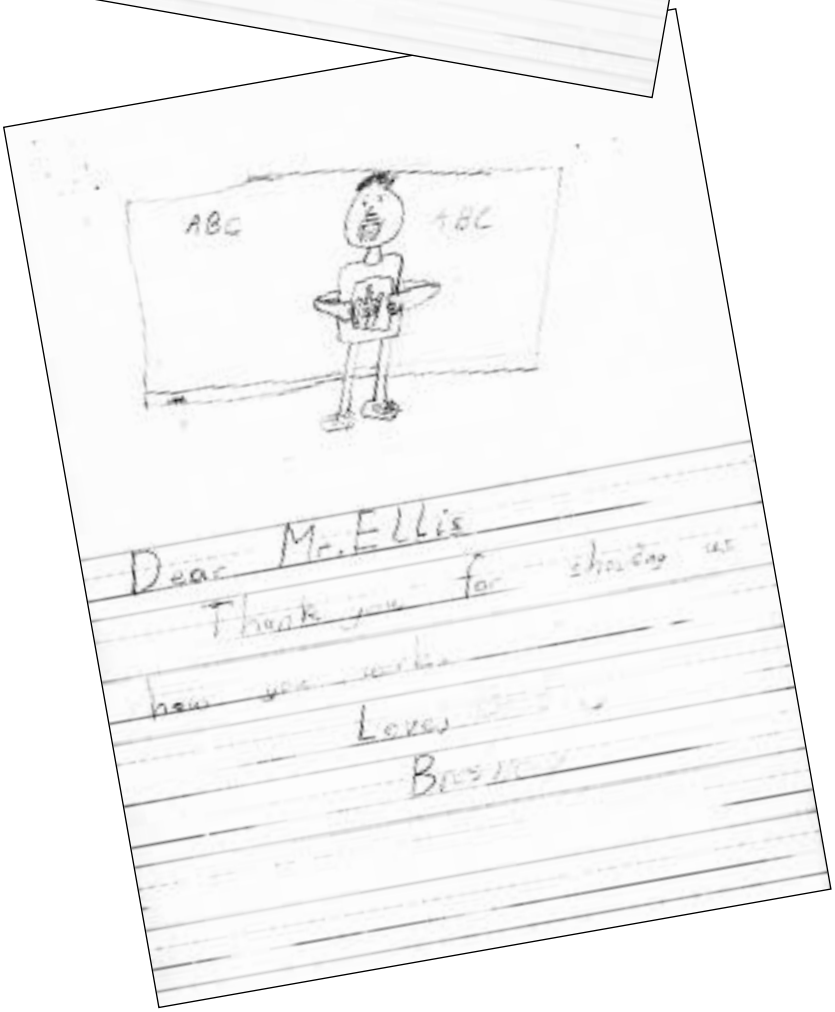
That was the question Fermilab physicist Keith Ellis, head of the Laboratory's Theoretical Physics Department, was invited to answer recently for his daughter Esmé and her second-grade classmates. Mr. Ellis's classroom presentation—he discussed math in his job and passed out photographs of Fermilab's Wilson Hall by moonlight—appears to have met with the approval of the second grade. Their illustrated thank-you notes expressed admiration for Esmé's dad, his line of work and his office building.

And just how does Mr. Ellis use mathematics in his work?

"I explained that all the stuff around us is made of little bits," he said, "and you need mathematics to watch 'em."

Did the kids have questions?

"Yes," Ellis said, "they wanted to know how long it takes me to get to work."



PUT IN NEW PHOTO

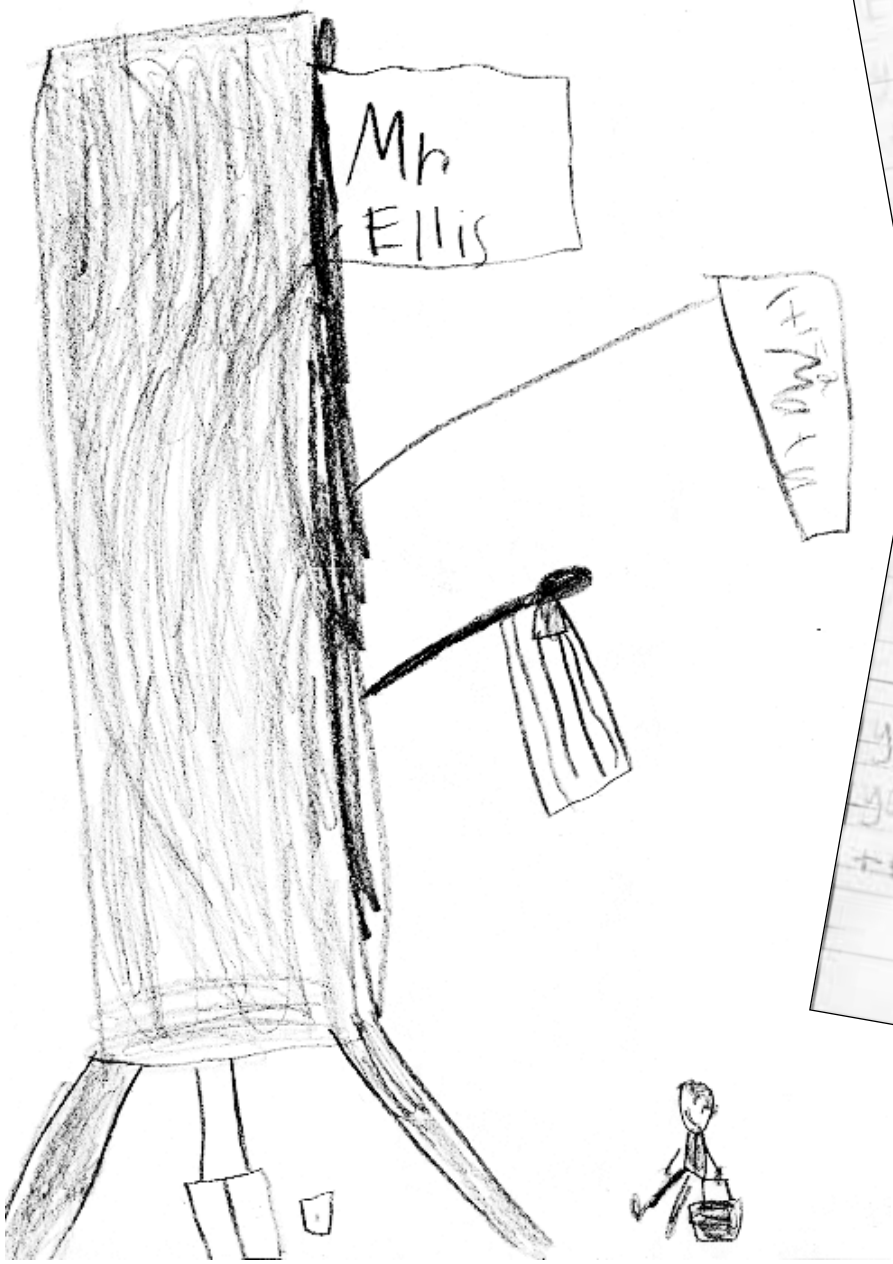
Photo by Reidar Hahn

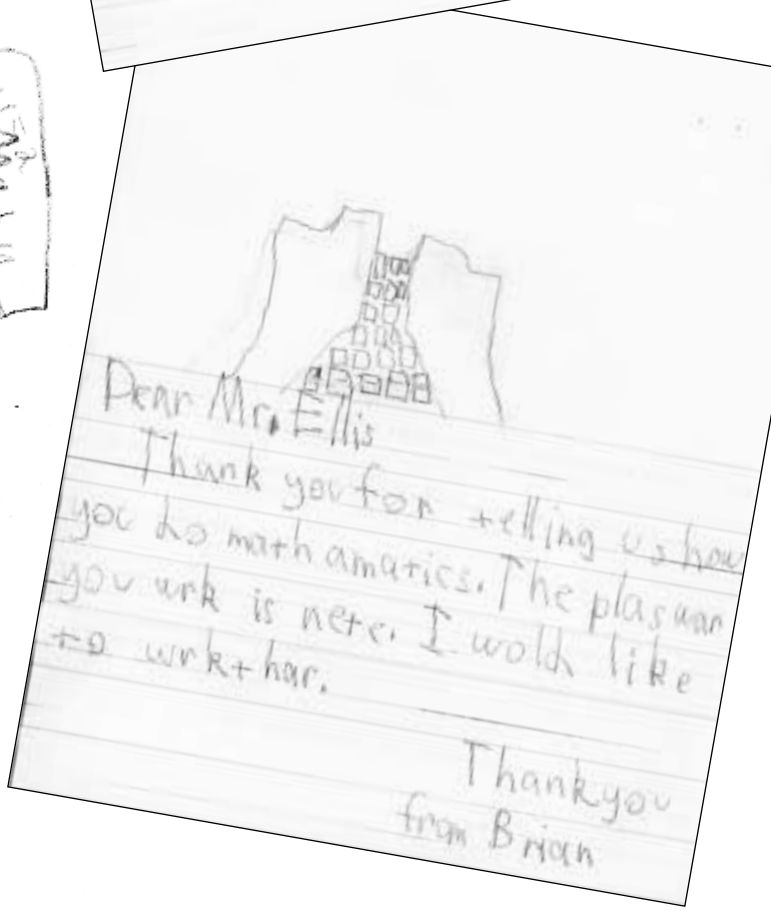
Fermilab's Keith Ellis—
theoretical physicist,
Esmé's dad and a "nice gye."

Mr. Ellis;

nk you for the wonderful
of your bilding. I enjoy
ou are a nice gyje.

from your friend,
Lauren





Profiles
IN PARTICLE PHYSICS

Chuck Marofske

Head,
Laboratory Services
Section

I.D. #54

by Sharon Butler, Office of Public Affairs

Everyone has noticed it: Chuck Marofske these days is positively radiant. That's because, after 30 years at Fermilab, Marofske no longer needs his 6:15 wake-up bell. He's retiring, taking with him a trove of memories.

Marofske started at Fermilab back in the days when men wore ties. He first shed his in the early 1970s, when the energy crisis hit and people dressed more casually to cope with the summer heat. Marofske says he quickly discovered he could "yell louder without a rope around [his] neck," and never wore one again. Now, if his pension falls short, he says, well, there's that closetful of ties.

It was in coat and tie in the old Oak Brook storefront that Marofske first took charge of the hiring and firing at Fermilab. He still has the yellowed ledgers with the initial handwritten log of entries and departures, and the numbering system he invented to identify employees. Now, nearly 12,000 people have passed through Fermilab's doors, all by way of Marofske's office suite.

Marofske held the same job for 30 years—head of Laboratory Services—but his portfolio kept expanding. Today it includes responsibilities as diverse as the cafeteria, visual media, the library and human resources. He shaped and implemented not only a set of personnel practices, but a policy of reaching out to minorities that was far ahead of its time. Get him talking, and he's passionate about equal employment opportunity. He effuses, too, about the public relations value of Fermilab's K–12 education programs, programs he helped save from near-extinction two years ago when Department of Energy funding dried up. Marofske may fret over the number of times he had to say no as head of Human Resources, but there were many times when he said yes.

Fermilab Photo

Marofske in the dunk tank in 1975.

Marofske has decided it's time for him, not just his ties, to retire. He thought long and hard about the things he'll miss: "being part of the excitement, sharing the tragedies and the good times, even the arguments [he catches himself: 'the discussions']." A stash of photos in his desk drawer recalls the lively parties—all well-earned, he quickly points out—when staff took turns in the dunk tank and Adam and Eve once showed up with a live snake draped around their naked arms. But he wanted to leave, he said, while he "still felt like doing things."

Those things do not include golf. Staff remember the time he whacked a golf ball harder and harder, and still it just bumped its way down the green.

But gardening: "I monkey around in my own backyard," he says, and now he'll be monkeying around in his daughter's. She wants lilacs; he wants peonies. He likes the perennials—when they come back, "it's like renewing a friendship."

Which he'll be doing with his long-time friend, former head of Fermilab's employment office Jim Thompson, who just had a hip replacement. Marofske kids Thompson that, for the winter months, they'll be mall walkers. "So, if you ever take a day off," Marofske says, "and you're walking around the mall and you see these two old guys, be kind."

Marofske has promised he'll stay on long enough to train his successor. Then he'll go, and bequeath to the next boss his old metal desk, the same one he's had for 30 years. ■

Photo by Reidar Hahn

Reports Identify Causes of Electrical Accident

Fermilab and DOE cite problems in planning, supervision and communication. Corrective actions are under way.

The hardhat that saved a worker's eyesight.

by Sharon Butler, Office of Public Affairs

The Fermilab report is seven pages long, the Department of Energy's 37-plus. But both reports say the same thing. An electrical accident that occurred in October could have been avoided if the work had been properly planned, supervised and carried out, and if there had been better communication between Fermilab and the contractor performing the work.

The accident occurred when two employees of Arbor Electric Company were installing temporary wiring to run lights, heaters and an elevator in the Tevatron's FZero Service Building. The electricians, who assumed the power to the building was off, were looking for a place to connect a neutral wire. Finding none, they tried removing the cover to a motor control cabinet, hoping to find a place inside. When they did that, the cover contacted the energized wire, a short occurred, and an arc of electricity flashed across the frame. Both men received burns to their hands; one man received burns to his face.

According to both the DOE and the Fermilab report, the accident occurred in part because planning for the task and communication between Fermilab and the contractor were inadequate. Specifically, the DOE report said, "there was no work documentation and no engineering drawings of the electrical system for the job"; consequently, "the electrical hazards could not be adequately assessed or addressed." Certain safety precautions were never discussed, the agency report said.

Also, neither Fermilab nor Arbor Electric staff supervised the work to ensure it was done safely. "Had someone visited the work site [while the work was under way]," the Fermilab report said, "the question of where to connect the neutral could have been raised and addressed before the shield [the cabinet cover] was removed."

Both reports noted that neither locks (shutting out the power) nor tags (identifying who was working on the circuit and when) were placed on the circuits leading inside the cabinet. LOTO, as the procedure for locking out and tagging is called, is standard practice at Fermilab and in industry when individuals are working with energized systems, according to Mary Grace, who, as associate head of Fermilab's Environmental, Safety and Health Section, led the Laboratory's investigation of events surrounding the accident. The contractor should have locked out the circuits and verified that the circuits were deenergized before beginning the work.

A team headed by Jim Finks, of Business Services, identified several corrective actions to address the problems identified. In future contracts, Fermilab will require that contractor staff be both knowledgeable about and trained in the safety hazards involved in the assigned tasks. Work will need to be scoped and hazards analyzed even for field changes (smaller construction tasks not originally specified in the contract). Those requirements will be included in training for task managers. Fermilab will also develop a policy and guidelines for formally documenting hazard analyses, so that communication between Fermilab and its contractors improves. Finally, a forthcoming letter from the Laboratory Director will reemphasize the importance of not allowing cost and schedule to compromise safety. ■

Photos by Reidar Hahn

The motor control cabinet, where the electrical accident occurred.

Photo by Fred Ullrich

Banner Headline

Move over, Martha Stewart! Fermilab runs new holiday decor up the flagpole.

by Judy Jackson, Fermilab Office of Public Affairs

Among the experiments conducted at Fermilab in 1997 was an exploration of new ways to decorate the Wilson Hall atrium for the Christmas season. In an effort to find a distinctive Fermilab style for the holidays—festive, colorful, environmentally correct, non-sectarian, and possibly even educational—staff from the Facilities Engineering Services Section and the Office of Public Affairs collaborated in creating and hanging banners depicting top quark events from particle collisions at CDF and DZero.

A set of eight colorful postcards, designed by Fermilab theorist Chris Quigg and graphic artist Bruce Kerr, in consultation with CDF and DZero collaborators, inspired the banner designs. The postcards show accurate representations of particle collisions at the two experiments, with colors and orientation changed by the artist for visual impact. They have proved popular with visitors and members of the Fermilab community. The banners translate the postcards into four-by-six-foot images printed on canvas and hung from flagpoles.

Although reaction from the Fermilab community to the holiday banners was mostly positive, it was by no means unanimous.

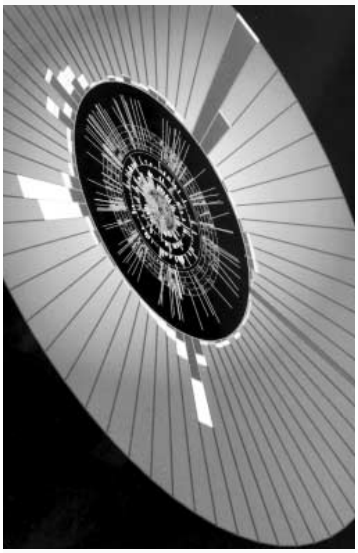
"I really like the banners," e-mailed astrophysicist Rocky Kolb. "It gives the atrium a warm 'medieval times' feel. It will be appropriate for the jousts between CDF and DZero."

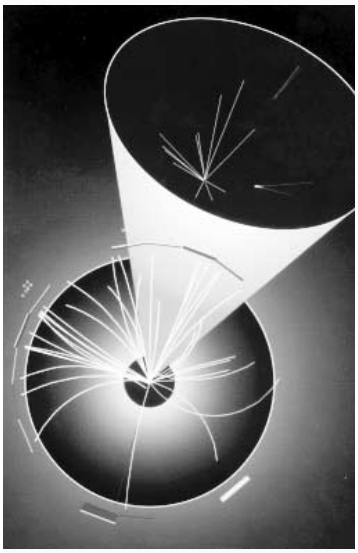
Fermilab physicist David Christian complained that the banners looked "tacky" and wondered if "Mickey Mouse on a bungee cord" would be next.

Angela Gonzalez, artist and aesthetic consultant, expressed strong distaste for the innovation, quoting Goethe to make her point: "Den Geschmack kann man nicht am Mittelgut bilden, sondern nur am Allervozueglichsten," which she translated as "(Good) taste cannot be achieved by learning from the mediocre (I add trash, there is not even much 'mediocre' left to go by) but only from the most excellent."

But the prevailing sentiment warmly supported the particle pennants as distinctive Fermilab holiday symbols. Many requested that the quark-spangled banners continue to wave after the holidays were over. However, the banners will go into storage in January at least until another holiday season rolls around, Public Affairs officials said.

Will the Christmas banners become a Fermilab tradition? Will it be "Deck the Halls with Quarks and Leptons!" or "Fling out the Banner!"? Stay tuned. ■





LHC Signing

continued from page 3

Photo by Reidar Hahn

Fermilab physicist Jim Freeman and University of Rochester technician Dan Ruggiero inspect a megatile scanner for the CMS detector.

DOE's Martha Krebs replied that the LHC agreement was most useful in establishing a general framework for collaboration in large scientific projects in many fields, not simply in high-energy physics.

"Does that mean that there is no agreement from Europe?" another reporter pressed.

Llewellyn Smith replied that looking at international collaboration "project by project, in a given field, is not a good idea. However, this agreement will make it more likely that many people in many different fields will find it easier to reach international agreements."

Civics 101

Reaching the international agreement for U.S participation in the LHC was by no means easy. Representative James Sensenbrenner (R-WI), Chairman of the House Science Committee, among others in Congress, raised strong objections to the U.S.-CERN agreement as originally proposed, impelling DOE and CERN officials to modify the terms of U.S. involvement.

"We have had a crash course in the American system of government," Llewellyn Smith told the gathering. "Although at times it seemed to be much more complex than particle physics—and I am still not sure that I know the answer to the question: who decides in Washington?— we seem to have survived to the end of the course."

The Europeans should probably not put away their Washington guidebooks quite yet. As U.S. particle physicists know, when one congressional budget cycle ends, another begins. Observing the jubilant festivities surrounding the signing ceremony, a senior congressional Appropriations Subcommittee staffer smiled.

"This is great fun," he said, "but next year it will be back to square one." ■

LAB NOTES

Environmental Report

The 1996 Report to the Director on the Fermilab Environment is available at the following Web address http://eshdbsrv.fnal.gov/Envir_Reports/.

URA Scholarship Information

Candidates for Universities Research Association (URA) scholarships are reminded that applications are due March 1. Applications are available from and should be returned to Personnel, WH 15SE, Mail Station 124. Scholarships are awarded on the basis of S.A.T. (Scholastic Aptitude Test) scores. URA awards a number of scholarships to regular, full-time Fermilab employees' children who are currently high-school seniors and who will begin a four-year college degree program next fall. The maximum amount of the scholarship is $3,000 for tuition and fees and is renewable for four years if the student progresses in good academic standing. Applicants will be notified regarding the scholarships in early April.

David Schramm 1945-1997

Dr. David Schramm, vice-president for research and distinguished professor of astrophysics at the University of Chicago and a member of Fermilab's Board of Overseers, died when his plane crashed near Denver, Colorado, on December 19, 1997. Dr. Schramm had a long and close association with Fermilab. The next issue of *FermiNews* will contain an article on Schramm and his work.

CLASSIFIEDS

FOR SALE

■ '94 Saturn SC2 two-door coupe, 43K miles, excellent condition, a/c, fm/am cassette, $9,000. Contact Michael, x2660 or mcarney@fnal.gov.

■ 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; Head Skis older-style bindings, $25; Kenwood multi-component stereo system w/cabinet. System includes linear-tracking turn table, amplifier ka-94, synthesizer am/fm tuner kt-54 (memory holds 14 ea am & fm stations), graphic equalizer ge-34, dual-deck cassette recorder kw-64w, cd player dp-840, 2 4-way 150-watt speakers jl-840, $1,500 obo. Contact Terry, x4572 or skweres@fnal.gov.

■ Coat, ankle-length Norwegian blue fox, size 10-12. Worn 10 times, paid $3,600, sell for $900. Free w/purchase: calf-length red fox coat w/leather trim & black seal vest/jacket w/hood (sleeves detachable). Phone (847) 741–7539.

MILESTONES

RETIRED

■ Jan Wildenradt, I.D. # 62, on February 27, 1998, from the Beams Division/Mechanical Support Department. His last work day was December 23, 1997.

■ Steve Barath, I.D. # 1481, on December 31, 1997, from the Technical Division/Engineering & Fabrication. His last work day was December 23, 1997.

■ Drasko Jovanovic, I.D. # 1850, on December 31, 1997, from the Particle Physics Division/Experimental Physics Projects Department.

LETTER TO THE EDITOR

Last Friday the Lab hosted a lunch in recognition of my and lots of others' 20 years of service. I realize these events go largely unnoticed by the rest of the Lab, but I'm sure I speak for everyone there in saying thank you to our Director, to Reidar Hahn, and especially to Tita Jensen and the entire staff at Chez Leon. It's easy these days to be overwhelmed by MIR, LHC, WBS, LOTO, and even LCW, but nice to know the pace can slow just long enough to remember it's the people who make Fermilab endure.

Tom Nicol

CALENDAR

JANUARY 11

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

JANUARY 12

Muscle-toning and step classes: Too many holiday goodies? Start your New Year's resolution now! Join us in the "Battle of the Holiday Bulge."

Step aerobic class: Monday & Wednesday, 5:30-6:30 p.m., 9-week class, January 19-March 18. Cost: $54.00.

Muscle-toning class: Tuesday & Thursday 5:30-6:30 p.m., 9-week class, January 20-March 19. Cost: $54.00.

Classes are held in the Recreation Facility. Registration and payment must be made in the Recreation Office, or send a check, payable to Bod Squad, to M.S. 126. Please note which class you are registering for on the check. Deadline: January 12. Current gym membership required.

JANUARY 12-13

Career Assessment Workshop for graduate students and postdoctoral research associates, 9–4, WH15SW conference room.

JANUARY 18

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

JANUARY 20

Wellness Works presents: Blood Pressure Screening, from 11:30-1 in the atrium of Wilson Hall, by the credit union.

JANUARY 23

NALWO potluck dinner, with drinks and appetizers, at Kuhn Barn, 6:00 p.m. Dinner begins at 6:30 sharp! Everybody is asked to bring either a main dish serving 6-8 people or a dessert serving 12. We will have soft drinks for everybody, pizza for the kids and wine for adults. Babysitting is provided. For further information, please call Angela Jostlein, (630) 355-8279.

Fermilab International Film Society presents: The Young Poisoner's Handbook, Dir: Benjamin Ross, UK/Germany (1996). Admission $4, in Ramsey Auditorium, Wilson Hall at 8 p.m.

JANUARY 31

Fermilab Art Series presents: Jerry Gonzalez and the Fort Apache Band, $19. Performance begins at 8 p.m. in Ramsey Auditorium, Wilson Hall. For reservations or more information, call 840-ARTS.

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.

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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.

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