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INSIDE

The Torch Passes at DZero

Paul Grannis's retirement as spokesperson for Fermilab's DZero collaboration marks the end of an era.

by Leila Belkora and Judy Jackson, Office of Public Affairs

His long-time collaborator and cospokesman summed it up. "Paul Grannis is the epitome of DZero," said Fermilab physicist Hugh Montgomery. "He made the experiment how it is. Not only the experiment, but, for better or worse, how we do business."

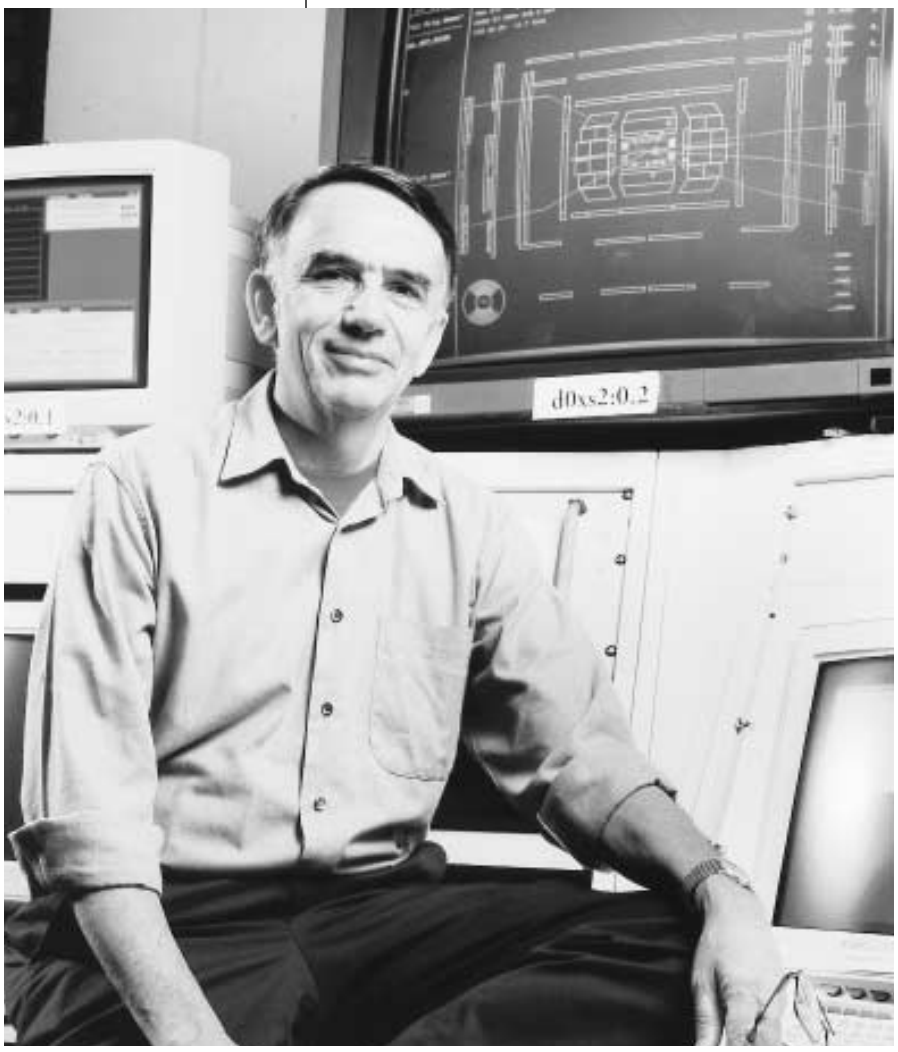

Photo by Reidar Hahn

Paul Grannis in the DZero control room.

For better or worse was just the beginning. For richer for poorer, in sickness and in health, for so long as there has been a DZero experiment at Fermilab, Paul Grannis has been a part of it. He was the original member and first spokesman of a collaboration that now numbers more than 450, taking his experiment from a mere gleam in Fermilab's eye to a world-class detector collaboration that—along with sister and competing collaboration CDF—announced the discovery of the top quark in 1995.

On March 3, the day after the announcement of the top quark's discovery, The New York Times quotation of the day read, "This monster, compared with all the other quarks, is like a big cowbird's egg in a nest of little sparrow eggs. It's so peculiar, it must hold clues to some important new physics. —Dr. Paul D. Grannis, leader of one of the groups that found the top quark."

"Paul has provided exceptional leadership for DZero since 1983 when the Laboratory asked him to form a collaboration and create a proposal for what is now the DZero detector. DZero's stunning success is in a large measure due to his efforts," said Fermilab Director John Peoples.

Grannis, a Stony Brook physicist, talks about DZero's detector with the passion of a teenage boy for his first car. "It will be good to see our old, long-lost friend again," Grannis said last March, as he waited for the detector to emerge from the Tevatron tunnel at the end of a collider run that had succeeded beyond the collaboration's dreams. "It will be good to kick its tires and climb around inside it."

Building DZero's dreamboat detector was no cakewalk. The experiment began in the early 1980s with a request from then-Director Leon Lederman for a "small, lean experiment" that

Fermilab Receives Environmental Honor

Renew America, a national nonprofit environmental institution, announced January 22 that Fermi National Accelerator Laboratory is a winner in the Seventh Annual *Renew America National Awards for Environmental Sustainability.* The awards are given each year to programs throughout the nation that demonstrate leadership and excellence in environmental development and awareness.

"As we prepare for the turn of the century, the Renew America award winners represent a vision of how we can preserve the earth for future generations," said Claudine Schneider, Chair of Renew America. "These awards are about individuals taking responsibility for this nation's environment, and a nation that takes seriously its environmental responsibilities to its citizens."

Twenty–four winners representing 23 different environmental issues such as transportation efficiency, solid waste management and open space protection were selected from more than 1,600 applicants. Fermilab is being honored in the category of Biological Diversity / Wilderness.

Environmental Leadership

Since the Lab's inception, Fermilab has maintained a strong dedication to the environment. Environmental specialists have been restoring native tall–grass prairie on the Fermilab site since 1975. The native American grasslands are thriving communities rich with plant and animal life, all interrelating in a complex ecosystem. Tall-grass prairie once blanketed northern Illinois; however, during the area's settlement in the 19th century, agriculture consumed all but a tiny remnant of the native grasslands.

Fermilab now has more than 1,000 acres of healthy prairie in various stages of reconstruction. During the past few years, other native habitats have also been restored, including savannas, woodlands and wetlands. The natural areas restoration project has had a significant impact on resource conservation at Fermilab and the surrounding community. Prairies and wetlands naturally conserve water and prevent runoff and erosion, thereby helping aquifer levels and protecting topsoil. The ecosystems that are being built and enriched maintain and protect many native plants and animal habitats.

"Fermilab has been an environmental steward for over 25 years, and we at the Lab are happy to receive this recognition for our efforts with the natural areas," said Bob Lootens, one of Fermilab's environmental specialists. "We are especially proud of our success with the tall–grass prairie, as Illinois is known as the Prairie State."

Many prairie plant species have never been seen by much of the general public of the United States. These plants are now flourishing in the prairie areas currently being restored and enriched at Fermilab. The Laboratory's environmental diversity is enjoyed by the entire community and is considered a vital open space area as suburbia continues its westward crawl, according to visitors to the site. Fox Valley residents also have had a direct impact on the prairie's vitality, as each year volunteers help with the prairie seed harvest in the fall. Last fall, more than 350 people volunteered to clip flower heads for the valuable tall–grass seeds.

Photo by Fred Ullrich

Fermilab won a national award for its environmental leadership and the biological diversity of its 6,800 acres of land.

A Washington Ceremony

On February 19, Fermilab will be honored with 23 other winners at a gala dinner in Washington, D.C. Senators Patrick Leahy (D–Vt.) and Barbara Boxer (D–Calif.), Congressmen John Edward Porter (R–Ill.) and Benjamin Gilman (R–N.Y.) will serve as co–chairs for the event. Dana Reeve, wife of environmental activist Christopher Reeve, will also attend to present the Second Annual Christopher Reeve Environmental Leadership Award to one of the winning programs. Mike Becker and Lootens, two of Fermilab's environmental specialists, are expected to travel to the nation's capital to receive the award.

Fermilab will be listed along with this year's finalists in Renew America's *Environmental Success Index*, a database filled with successful environmental programs around the nation. It is available in print as well as on the World Wide Web. ■

Fermilab Confers First Employee Recognition Awards

Recipients of the new award cite team approach to their work.

by Donald Sena, Office of Public Affairs

Ruth Pordes, head of the Computing Division's Online Systems Department, and John Cooper, head of the Particle Physics Division, are the first Laboratory employees to receive a newly created employee performance recognition award for their work and dedication to the success of the Laboratory.

The Fermilab Personnel Policy Guide describes the accolade, which carries a monetary value, as "a pilot special award program [that] has been instituted for outstanding contributions to the Laboratory demonstrated by innovation, discovery, extraordinary effort, and / or cost reduction in one of the following areas: technical project management, management of major functional Laboratory areas, and scientifically significant programmatic contributions."

Ruth Pordes received the award for her management of the Data Acquisition Fixed Target (DART) project, the hardware and software used by the fixed–target experiments; Pordes was nominated by Vicky White, former deputy head of the Computing Division.

"From the inception of the DART project to the present, Ruth has worked tirelessly and continuously to make it a success," wrote White in her letter to Fermilab Director John Peoples. "...It is a great credit to Ruth's leadership skills that the project achieved its goals and that, for the first time that I can remember in my history with the field, experiments were taking data, almost without a hitch, so soon after beam arrived."

Cooper received the award for putting his science research interests aside and accepting the challenging role of leading the new Particle Physics Division, which was created during the Laboratory's reorganization. Chuck Marofske, head of the Laboratory Services Section, nominated Cooper to receive the award.

In his nomination letter, Marofske wrote, "While this award recognizes that John has agreed to lead the largest division at the laboratory, thereby foregoing his research opportunity with CDF, I want to note that even in six months since he was designated to lead the new division, he has done a great deal to assist in its creation."

Photo by Reidar Hahn

Fermilab Director John Peoples (right) with award recipients Ruth Pordes, of the Computing Division, and John Cooper, head of the Particle Physics Division.

New Leader of Particle Physics Division

Cooper officially became the last head of the Research Division in November. In the following weeks, Cooper, his deputies and other division heads and deputy heads guided the Lab's reorganization. The Research Division added 124 people from the Physics Section to become the new Particle Physics Division, while reassigning 80 people to the new Beams Division. Cooper stresses that while he received the award, the work of the reorganization required much teamwork, a philosophy that will be required through his tenure as division head.

"It wasn't just me who did this. It was a big group of people, particularly Bob Trendler and Stephen Pordes, my deputies. We were meeting at least twice a week, if not daily, trying to work out these details," said Cooper.

During his tenure, Cooper said he hopes to accomplish many goals. Short–term projects

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Diffraction

Diffraction: From Compact Discs...

by Michael Albrow, Particle Physics Division

Look at the glints of color from the surface of a compact disc when you hold it up to a light at certain angles. The colors result from a phenomenon called diffraction, in which small ripples on the surface of the compact disc break up white light, carried by particles called photons, into the colors of the rainbow. Red and blue appear in different places because they correspond to waves of different wavelength.

A classical demonstration of diffraction that more closely resembles some high-energy physics experiments is to pass light through a narrow slit or past a small obstacle. You can see this for yourself. On a dark night look at a small, bright, distant light; the smaller, brighter and farther the better. Place two small pieces of cardboard side by side but overlapping and slightly angled to form a slit, and put this sharp vee just in front of your eye. If your focus is relaxed you will see faint fringes that spread out more as you look towards the narrowest part of the slit. Experiment with this; it can even work using your thumbnails.

This behavior of photons glancing off the surface of a compact disc or passing obstacles is relatively easy to demonstrate and explain. But whereas physicists understand the diffraction of visible-light photons, the diffraction of particles such as protons is still rather mysterious. In an effort to understand particle diffraction, Fermilab and Argonne National Lab researchers organized a conference last September.

Physicists have learned that all particles—electrons or protons, neutrinos or quarks—can undergo diffraction. When two protons, or a proton and an antiproton, collide, the simplest thing that can happen is that they emerge with no loss of energy but with slightly changed direction. This is an example of "elastic scattering."

At the Tevatron, the collision of a proton and antiproton can give rise to many different final states, some with only two particles but usually with many more. **Figure 1** shows two particles producing many particles, symbolized by several lines emanating from the collision region (the oval). The symmetry of the interaction process means that we can reverse the direction of time in the diagram; in other words, many particles can also interact to form two. **Figure 2** shows a "special case" of all the possible outcomes of a proton and an antiproton interacting: they make many particles, which recombine so that the final state is again a proton and antiproton. Intermediate states, shown schematically by the lines between the ovals, are called "virtual."

An alternative view of the proton-antiproton collision is to consider that something carries momentum from the scattering proton to the antiproton. This exchanged "thing" is called the pomeron, after the Russian physicist Isaak Pomeranchuk (1913-1966). Thirty years ago Pomeranchuk proved important and fundamental theorems about particle and antiparticle scattering at very high energies. It is this theoretical entity, the pomeron—not really a particle but sometimes behaving like one—that we hope to understand.

We can distort Figure 2 to represent the virtual or intermediate state as a "ladder" linking the particles (**Figure 3**). We know that protons are composites of quarks and carriers of the strong force, known as gluons, so the "ladder" must consist of these. We can think of this diagram as representing the exchange of a clump of gluons, with perhaps some quark-antiquark pairs, between the scattering protons.

...to *W* bosons

Figure 1

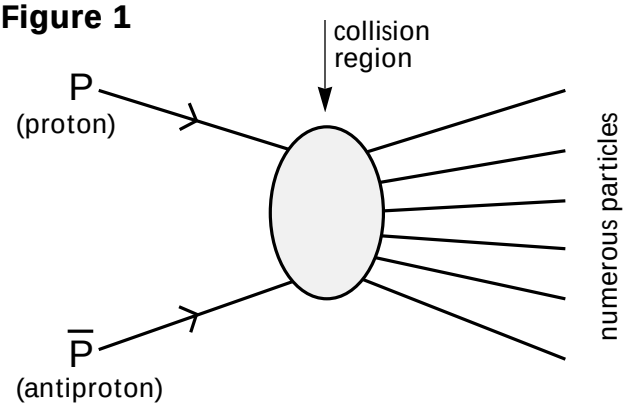


Figure 2

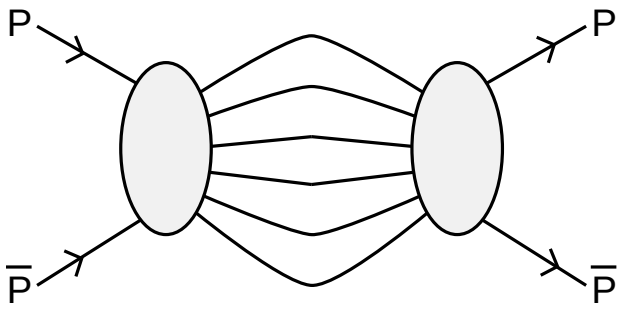


Figure 3

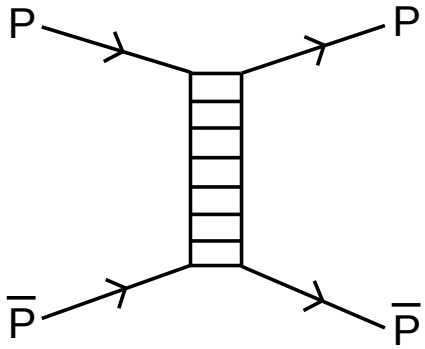
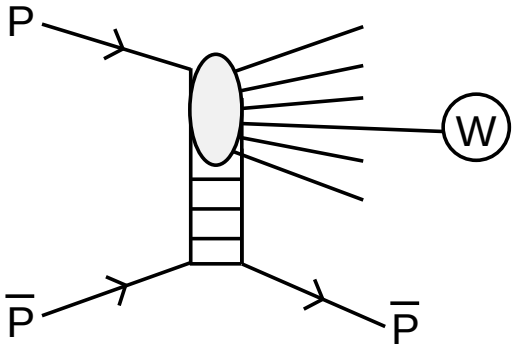


Figure 4



Another interpretation of the scattering process is that in most proton-antiproton collisions one gluon is exchanged, but then the protons or antiprotons cannot escape unchanged; there would be a strong "gluonic" force between them which would cause many new particles to be produced. But if *two* gluons are exchanged their gluonic forces can cancel out, and the protons and antiprotons can escape with just a small deflection. While two gluons are being exchanged they "talk to each other" (to use a typical physicist's phrase), exchanging more gluons, and the diagram of the interaction then looks like a ladder. Figure 3 is a good model of the pomeron, although it is difficult to calculate its behavior from basic theory.

Often when a pomeron is exchanged, as in **Figure 4**, one of the protons transforms into many particles. This is the same "two particles to many" process shown in Figure 1, but for a pomeron-proton collision. Both colliding-beam experiments at Fermilab, CDF and DZero, are studying such events and unraveling the structure of the pomeron. This study was pioneered by an experiment (UA8) at CERN, which found jets—sprays of particles—being diffractively produced. The Tevatron has three times the energy of the CERN machine and can do this physics with higher event rates and higher energy jets. CDF researchers are intrigued by new results from the analysis of 1991-1995 data on diffractive scattering pomeron-proton collisions. These events produce the very massive *W* boson, which is 85 times heavier than the proton. The *W* boson is a particle that carries the weak force. These results confirm that the pomeron contains quarks; gluons cannot make *W* bosons directly. Physicists at the electron-proton collider HERA in Germany study pomeron-photon collision events. Like the *W*, the photon does not interact directly with gluons, and from the rate of their events they conclude the pomeron has quarks. Both CDF and ZEUS (an experiment at HERA) conclude that a pomeron consists of about 60 percent gluons and 40 percent quarks.

The task now is to study pomerons much more accurately and to compare the results with those from HERA. Does it still make sense to think of this enigmatic object, the pomeron, as if it were a particle? Will HERA's measurements, using a photon as a probe, give the same answers as Fermilab's, using a proton as a probe?

One of the reasons physicists are interested in pomerons is that they appear to have a close relationship with vacuum. Vacuum is what is left after all the real particles are removed from a box; the space, physicists believe, is not empty, but teeming with so-called "virtual" particles that flit into and out of existence. In some high energy proton-antiproton collisions the original two particles lose just a small percent of their energy, which appears as a cluster of particles created apparently out of the vacuum in a phenomenon called vacuum excitation. Another viewpoint is that events of this kind are the result of two particle-like pomerons colliding. Events like these have hardly been studied at the Tevatron, though CDF and DZero both observe them. Some particle physicists think the study of pomerons would be a very interesting project for Fermilab's next collider run. ■

Local Company Makes Good (Magnets)

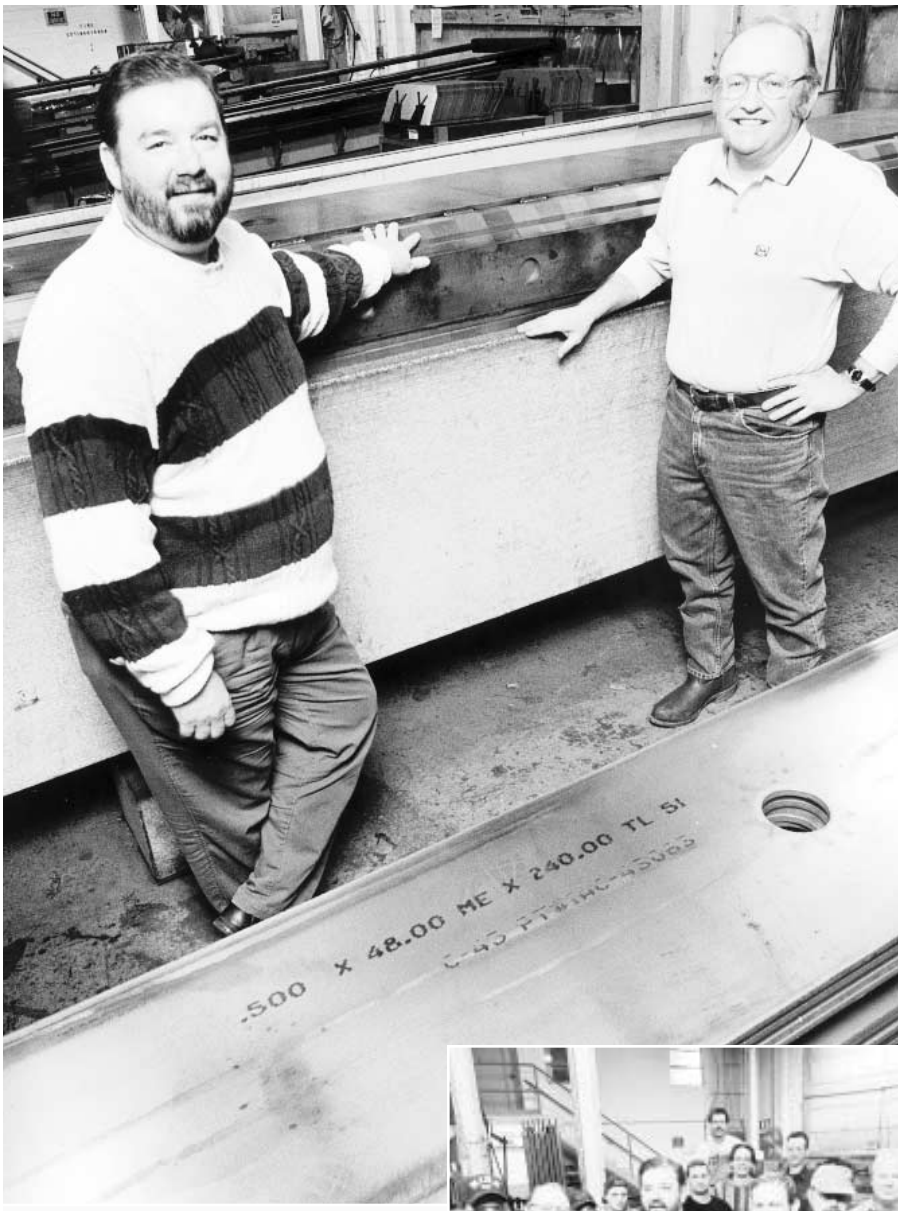
by Leila Belkora, Office of Public Affairs

For Gary Durling and Mike Yeoward, co-owners of a metal fabrication business in Rock Falls, Illinois, winning a Fermilab contract proved both more challenging and more rewarding than they expected. In the three years that SVF Incorporated has been making half-cores—the steel innards of dipole magnets for Fermilab's new Main Injector particle accelerator—Durling and Yeoward have learned to live up to extremely tight specifications and demands for exceptional quality assurance. In reorganizing the company to meet the challenge, they've improved their bottom line. "We have the feeling now that we're running at the level that we always thought we could reach. The ability to supply Fermilab is an attractive thing to have in our dossier," says Durling.

The parts they make confine and shape the magnetic field that steers high-energy particles around the circular accelerator. Dipole magnets destined for Fermilab's Main Injector consist of a half-core on the top, an identical one on the bottom, and coils in the middle; the parts fit together like a sandwich in which the coils are the ham. The half-cores are 20 feet long, and they curve a little along their length, to match the curved path that the beam will follow in the accelerator.

SVF's crew of half-core builders includes production and procurement managers, two quality control specialists, two "lead men" supervising work on the floor, six technicians, two certified welders from a pool of eight employed at the company, and a truck driver to haul the raw materials from Fermilab and return the finished product. The technicians perform a variety of tasks including mixing epoxy, coating steel plates or laminations with epoxy ("wet laying"), stacking laminations, using a curing oven, and operating a "grit blast" to clean excess epoxy off the stacked laminations.

The half-cores contain about 4,000 thin steel laminations, which another contractor has stamped from steel sheets so that the shape of the laminations is just right to make the correct magnetic field. The challenge for SVF employees is to stack the laminations so that the 20-foot-long half-cores are within 30/1000ths of an inch of the specified length, the bottom and top faces of the half-cores are



Above, Mike Yeoward (left) and Gary Durling in their Rock Falls factory.

At right, the half-core building crew, left to right: Dan George, Gary Durling, Mike Beyer, Jason Burge, Mike Yeoward, Jason Mammosser, Mike Thorne, Cralles Borden, Tim Hoagland, Richard Spohn, Art Meighan, Tom Goss.

"The level of quality control is higher than I've dealt with in my metal fabrication career."

~ Gary Durling, co-owner of SVF Incorporated

flat to within 5/1000ths of an inch, and the whole assembly follows the so-called sagitta bar that gives each half-core its gentle curve. "The level of quality control is higher than I've dealt with in my metal fabrication career," said Durling, who has been in the business for about 30 years. To stack the laminations with the tightest possible fit, SVF workers follow a "recipe" provided by Fermilab that accounts for small variations in the lamination dimensions.

The process of putting a half-core together begins with end packs. "The end packs really serve as 'bookends,'" explained Gale Pewitt, project manager for Main Injector magnets at Fermilab's Technical Division. Once the end packs have cured, technicians bring them to the central work area and lay the first one on a special stacking table. Starting at one end, technicians stack laminations behind the end pack, apply a clamp, and stack again. They weld top and side plates to the "bookends" and, intermittently, along the length of the half-core. Epoxy ensures that the end packs hold the right shape under pressure.

"If the end packs weren't glued, we would have to machine a similar shape from a solid piece of iron," said Pewitt.

At every step, inspectors check that the flatness matches the blueprint specifications and record the results of tests in a notebook, or Traveler, assigned to each fabrication element. Durling said SVF employees adopted Fermilab's quality assurance program to help them meet the Laboratory's stringent requirements, and that the program boosted SVF's productivity overall. "We used to tolerate 25 to 30 percent 're-work' jobs," said Durling. "Quality was important to us, but it was hard to put a handle on it. We figured there's 10,000 ways to make something wrong, and only one way to make it right. In the process of dealing with the Fermilab contract I was lifted to a level of quality I did not have practice with before, and that has totally boiled over into other areas. Our rework rate is now something like 5 percent."

Durling credits Fermilab Project Engineer Nelson Chester and Material Control Group Head Gregg Kobliska with helping him along the learning curve.

Photos by Fred Ullrich

Above, Richard Spohn lowers a group of laminations onto the table to add to the stack (foreground). Each lamination has notches stamped out of the bottom edge, where the magnetic coils will fit.

At left, Spohn uses a feeler gauge to test the flatness of the bottom edge of the stack.

"We had problems to overcome, but I had regular contact with Fermilab, and if I couldn't figure it out, they helped me through the problem," he said.

Pewitt has nothing but praise for SVF, saying, "They've done a good job of providing a high-quality product." Durling is ready to take things a step further. "I'm proud of what this company has done. Sometimes we had to be led by the hand a little bit, but we took advantage of Fermilab's expertise. Now we're out to attract other aspects of the magnet business." ■

DZero

continued from page 1

would use a second interaction point around the proton-antiproton accelerator.

Said Grannis, "Preferably it would be a clever proposal and cost no money. By 1983, the number of proposals had been winnowed down to a few. None was as physically small or clever as Leon wanted. All the proposals were judged [by the Physics Advisory Committee] to be too unambitious."

Fermilab physicist Gene Fisk, a collaborator since 1986 and now Deputy Head of the DZero Project, said Lederman then appointed Grannis to pull together a team and come up with a conceptual proposal for the new detector.

"Paul got the collaboration together and drew up a more complete design, incorporating good ideas from all the proponents," Fisk said. "There were several interesting features. Unlike CDF, where one sixth of the accelerator ring was dug up to install a 25-foot-high bypass for the detector, at DZero the Tevatron and Main Ring beams are separated by only 2 meters. That made it challenging and created some constraints for the calorimeter," he said. He added, "Paul should get credit for pulling the group together that built the detector. The multimillion dollar cost required a lot of effort in the way of justification."

That is putting it mildly. Through the mid-1980s the collaboration struggled for funding, even as new groups joined DZero to get in on the physics action. "In the early days," Grannis said, "it was somewhat of an uphill battle, because firstly, CDF had preceded us by four or five years, and were clearly on track to get something into the collider at the time the collider would be turned on. They were under high pressure, and well along at the construction site.... Secondly, a detector was proposed at SLAC almost at the same time as DZero. We were competing within the Department of Energy for these two rather comparable-sized detectors. There was a lot of priority given to the SLAC initiative because they, in turn, were in competition with CERN—in electron-positron collisions—and wanted very much to keep on top of that competition. It was a hard start-up for DZero in that sense."

Under Grannis's leadership, the project forged ahead with plans not only to build the detector, but also to prepare for the upgrades that are currently underway. "In spring 1990 John Peoples issued a document asking how we were to upgrade DZero," said Grannis. "The thing that was odd about it was that it was still two years before we started running with the original detector!"

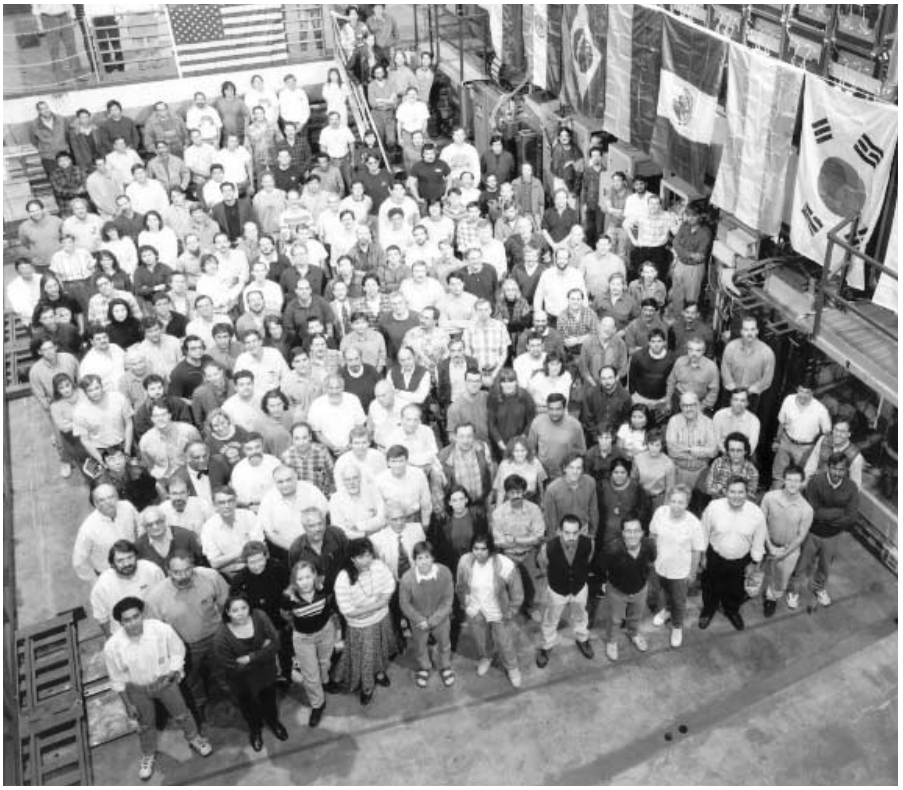


Photo by Reidar Hahn

Where's Grannis? Hint: the former DZero cospokesman is in the lower left corner of this 1996 collaboration portrait—just in front of the group's new cospokesman, Harry Weerts.

The DZero experiment at last began collecting data in 1992, chasing after the top quark, among many other projects. Because top turned out to be so massive ("a cowbird's egg!"), experimenters had to accumulate data over several years to find it. DZero's late start compared to CDF's was not as severe a handicap as experimenters feared.

"What really mattered for the discovery of the top quark," said Grannis, "was the operation of the accelerator and the accumulation of data. It was certainly gratifying to see that both CDF and DZero got there together, and I think they truly did."

Last fall, Grannis decided the time had come to play a new role in the DZero collaboration. In November 1996, the spokesperson's torch passed from Grannis to Michigan State University physicist Harry Weerts, following DZero's elections. Fermilab physicist Hugh Montgomery continues to act as cospokesman, a role he has filled since 1993.

Though Weerts is no stranger to the collaboration—he was a charter member—he's somewhat daunted by the prospect of doing Grannis's job. "It's difficult to fill Paul

Grannis's shoes. You could say I'm slopping around in them, and I hope someday to walk in them and know where I'm going. I still have a lot of homework to do," he said.

As a private citizen in the DZero collaboration, Grannis looks forward to analyzing data in the Top Quark Physics Group, and to teaching advanced classes at Stony Brook. He also serves this year as chair of the Division of Particles and Fields of the American Physical Society.

"As I see it, there is no better opportunity in the world to do first-rate physics than here, this experiment. I would like to do some of my own analysis and participate a little more strongly in the work of my students. I also look forward, after fourteen years, to quitting teaching elementary physics at my university. The only way that I have been able to teach and travel is to teach the introductory course so I could make arrangements to be gone some of the time. I'm looking forward to teaching a real physics course at something other than the introductory level," Grannis said.

Weerts says Grannis is still willing to advise him in his new capacity as spokesman. Weerts began working in the DZero collaboration while an assistant professor at Michigan State, and served as chairman of the collaboration's Physics Analysis Committee. His new job involves a different set of skills: staying abreast of all the papers put out by the collaboration, determining where priorities lie between analyses and upgrade projects, and speaking for the collaboration to the rest of the world. He said he's familiar with the expression that managing physicists is like herding cats, but insisted that being spokesman is even worse. "It's more like one cat herding 450 other cats," he said. ■

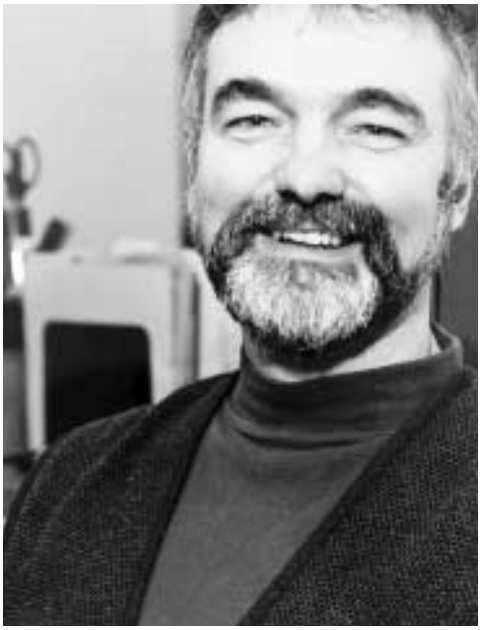


Photo by Reidar Hahn

Harry Weerts, from Michigan State University, is the new cospokesman of DZero.

ICFA Makes a Statement

In October 1996, about 100 senior particle physicists from 20 countries met for a seminar sponsored by the International Committee for High Energy Physics—known to its friends as ICFA—at Japan's National Laboratory for High Energy Physics. They heard presentations from leaders of the high-energy physics community, including directors of many of the world's leading particle physics laboratories. Based on the presentations and discussions at the seminar, ICFA produced a statement summarizing the status and prospects for high-energy physics, stressing the value of international collaboration for both the present and future of the field.

1996 ICFA Seminar Statement

The 5th triennial ICFA Seminar on High Energy Physics (HEP) was held at the Japanese National Laboratory for High Energy Physics (KEK) on October 15-18, 1996. It was attended by over 100 scientists from some 20 countries and discussed the future plans of the world's HEP laboratories.

The program focused on the high energy frontier. The LHC proton collider project at CERN is essential for progress in the field and ICFA hopes that it will be completed as early as possible. This facility will address today's key questions and open a new energy domain. Its importance is indicated by the commitment of CERN non-Member States to support both the facility and experiments. The LHC is becoming a true world facility. We note with concern recent indications of possible problems in CERN Member States with LHC funding. Stable funding is important for effective realization of such large projects. ICFA is therefore pleased to note that the Member States recently "reaffirmed their strong and unanimous support for the LHC program and their wish to find a quick and stable solution to the budget problem which will allow the LHC to be completed in a single stage as early as possible".

Much of the progress of the last 25 years has come because of the different capabilities of two types of accelerator: hadron and electron colliders. Thus, the second major focus of the Seminar was on progress in developing the technology that will allow the construction of an electron linear collider that will complement the LHC. A well coordinated worldwide R&D program has been underway for many years. It now appears that an engineering design study can begin in the next few years that will result in a proposal for a specific project. We believe that such a facility should be realized as a worldwide enterprise on a basis developed jointly by interested scientific communities and their governments.

The Seminar included reviews of the ongoing programs and projects close to completion at the world's particle accelerator laboratories. Difficult financial climates in most regions of the world have required hard choices. Even so, ICFA notes impressive progress and anticipates that the coming few years will result in substantial advances in our understanding of the nature of matter and forces. ■

Updates

January 17— January 29

ACCELERATOR

High–energy physics data accumulation returned to the Laboratory on January 17, when the accelerator completed its studies and directed the beam towards the fixed–target experiments. The first week of beam was sporadic, as many of the experiments were still making adjustments to their equipment. The Beams Division raised the intensity, but had to back it down as many of the experiments weren't ready. However, by late January, most experiments were back on line.

"Over this last weekend, which was January 25 and 26, most of the experiments were with us. We were running around 2.2, 2.3 (x 10^{13}). So, we are pretty much back to where we were before Christmas," said Bob Mau, head of accelerator operations.

As of this writing, the biggest glitch occurred on January 28, when the machine experienced the failure of a kicker power supply.

FIXED-TARGET

Collaborators provided this update on fixed-target experiments.

E799 / E832 KTeV "Over the Christmas shutdown, KTeV has completed major detector repairs, vacuum window replacement, beamline change, etc. The CsI calorimeter is now running at the designed 53MHz clock frequency. E799 started receiving hadron beam on January 19. After some beam and trigger studies and detector tune up, we started taking physics quality data on January 24. We are currently taking data at 4E12, and improving the detector and trigger so that we can run at higher intensity," said Taku Yamanaka.

E866 NuSea "After last year's successful run, E866 is now concentrating on improving the statistical precision at the high end of the dimuon mass spectrum. A few initial problems were quickly fixed and now we are again taking good data with the spectrometer acceptance centered near the Upsilon mass. We have also started to move the data analysis from our own machines to the Fermilab farms," said Vassili Papavassiliou from New Mexico State University.

E835 Charmonium "After the Christmas shutdown E835 started taking data again on January 19 at the psi' resonance and continued the search for the eta_c' until the stack was lost. On January 24 we had our second stack of the year. In addition to our search for the eta_c', we took data at the chi_2 resonance and, for the first time this fixed target run, the antiproton beam was decelerated successfully below transition to the eta_c mass," said George Zioulas, a collaborator from the University of California at Irvine.

E862 Antihydrogen "The PBar source has resumed operations (after the holiday shutdown) and we are accumulating statistics, both in our normal running mode and without the foil that normally ionizes the antihydrogen. The purpose of running without the foil is to demonstrate that our signal depends on the presence of this foil, which is less than 9,000 carbon atoms thick," said Dave Christian.

E815 NuTeV "NuTeV had a record week of intensity: 8E16. We also had record fast spill intensities for individual pings. The ping structure has never looked better in the history of the Lab. The detector is running and we continue to map our detector response. Keep going!" said Bob Bernstein.

E872 Donut "The collaboration is in the final period of testing before the emulsion exposure. Our days are spent working on problems that arise with the spectrometer and installing shielding for neutrons and gammas. The evenings involve studies of the spectrometer and shielding with beam. We're all optimistic at the progress that we've seen," said Vittorio Paolone from the University of Pittsburgh.

E781 SELEX "SELEX has recovered from the shutdown, although not without pain. A flawless set of tests before beam showed that all new and repaired equipment was ready to go. When beam came, the gremlins came out," said Jim Russ. "We lost a magnet power supply. Good work by the Magnet Group repaired that. We had a failure in the gas system for wire chambers. That was fixed. We had several different types of FASTBUS modules fail. They have been replaced. These events made the first week of operation far more exciting than we would have wanted. Now, we're back to the job of taking data and working on improving the trigger so that we can handle more beam."

E831 FOCUS "The four recently installed silicon planes just downstream of the targets are currently being integrated into the existing system. We are still taking data during this time and closely monitoring our daily charm yield," said Kevin Stenson, from the University of Wisconsin–Madison, on January 28.

E871 HyperCP "Following completion of helium–bag installation, we were able to take our first beam of the year last Friday [January 24]. We have been continuing to shake down the detectors and readout system and also have been carrying out targeting–angle and trigger–rate studies," said E871 collaborator Dan Kaplan of IIT.

Photo by Reidar Hahn

George Zioulas, Tsuyoshi Nakaya and Margaret Votava work with DART equipment.

Employee Recognition Awards

continued from page 3

include ensuring the fixed–target run is a success, while keeping the upgrades for the two collider detectors on pace. Coming from CDF, Cooper said he is looking forward to immersing himself in all of the science and projects at the Laboratory.

"...DZero is just as much my project now as CDF, as is NuMI and CMS and all the fixed–target experiments," said Cooper. "I have to make sure all of our projects succeed."

Acquiring Data

Pordes also stressed the team atmosphere of the DART project. She said the technical team worked with researchers from many experiments to design a common data acquisition system that would also be flexible enough to serve the specific requirements that arise. Although the people who worked with Pordes are too numerous to mention here, she said the success of the smoothly running DART system is a tribute to the ability of the researchers to put their own needs aside and take on the challenge of building one system to acquire and process the voluminous data.

"I want to recognize the team that brought DART to a successful conclusion," said Pordes at the award ceremony on January 9. During a more recent interview, she added, "...Although [it] is given to one particular person, the award should be regarded as a recognition of a team effort." ■

Ed. note: For a more comprehensive description of the award's criteria, see the Fermilab Personnel Policy Guide.

CALENDAR

FEBRUARY 8

Red Hot & Cole

In a scintillating mixture of mood, music and biography, Red Hot And Cole celebrates one of the great masters of melody and lyric line. Cast in the form of a party spanning four decades of Cole Porter's life, this two-act revue traces his life from Indiana to the world stages of New York, London, Paris and Venice; through his marriage, his friendships with the great stars of his age and the tragic riding accident that crippled him in mid-career — physically, but not artistically.

Fermilab welcomes this unusually nuanced revue of the music and life of Cole Porter to Ramsey Auditorium on Saturday, February 8 at 8 p.m. Tickets are $18 and available through our box office at (630) 840-ARTS.

FEBRUARY 16

The Fermilab Folk Club is sponsoring a special family dance at the Village barn from 2–5 p.m. Eric Zorn, one of the area's premier callers, will be calling this dance. Music will be provided by The Common Taters. The dances are contras, squares and circles. 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. For more information, contact Lynn Garren, x2061 or Dave Harding, x2971.

FEBRUARY 22

Philip Glass: An evening of solo piano. See page 12 for details.

ONGOING

English lessons, Thursdays 10–noon in the Users Center, call Jeanette Antoniuk, (630) 769-6518.
NALWO coffee mornings, Thursdays 10 a.m. in the User's 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.

GERMAN CLASSES

Whether you are a beginner, speak a little German or just want to come for conversation, you are welcome to join our classes. They are taught by Angela Jöstlein, a native of Germany. A nominal fee for materials will be charged. The classes meet at 5:30 p.m. every Tuesday in the conference room at 20 Neuqua, just outside Lab 7, across from the gym. Feel free to call Angela, (630) 355-8279 or E-mail Hans at JOSTLEIN@FNAL.gov.

FAT TESTING

A hamburger is 50 percent fat. Do you know what percent body fat you are? Now you can find out. You can have your body fat reading done on Wednesdays during the month of February between 11:30 a.m.–12:30 p.m. in the Users Office. It only takes a few minutes, so stop by. Sponsored by Wellness Works.

CLASSIFIEDS

FOR SALE

■ 1996 Ford Ranger Xlt Supercab, 25k miles, 5 speed, 3.0l V-6, Am / Fm / Cas, Air, $12,600. Must Sell, Call Conboy, x2946 or Pager x0458.

■ 1987 Chevy Blazer. Two tone blue & silver. Air, cruise, tilt, cassette. 2.8 liter V6 140k miles. New factory engine installed in April, along with new brakes and tires all around. Body and interior in good shape. Call Robin, x3377 or Robin@fnal.gov.

■ 1986 Mazda 323, fuel injected, 4 speed manual transmission, 72k miles, $1,000. Call x3697 or (630) 584–5769.

■ 1983 Toyota Tercel 4WD Wagon, 5 spd, well maintained, 175k miles. $1,200 obo. Call Marilyn, x8781, (630) 961–0885, or Marilyn@fnal.gov.

■ Misc. Furniture: two solid wood desks, about 30 years old, 20"x 40" and 21"x 48"; antique Hoosier; large antique oak medicine cabinet; old abbey chair; 20" color TV; antique Eastlake lamp table; antique oak drop-leaf table; microwave oven; Mr. Coffee 10-cup. Must sell. Call x3697 or (630)584–5769.

■ Ski's—Atomic Arc 195 Salomon 547 Sport Bindings, size 12 US or 13 EU Trappeur 2000 boots also have ski and boot bags, asking $200 obo; Two kerosene heaters $35 and $55. Johnson Outboard Motor 9 1/2 HP rebuilt in 1995 $500 obo; 16 ft. Fiberglass DuoMarine Boat needs work, hardware already removed and rough sanding completed $150 obo (have pictures). Two Drake Satellite Receivers (ESR 424 and ESR 24) for Cu Band, VideoCipher II and other older Satellite equipment make an offer. Call Terry, x4572.

■ Boom Box by Sharp, 5 yrs old. Equipped with CD player, radio and dual cassette, $25. Call Connie, x3469.

WANTED

■ Interactive, experienced childcare sought: Long term position from April or May 1997 caring for pleasant, musical 2 1/2 year old girl five days / week, 9 am to 5 p.m. English fluency and car necessary; cognitive development training and / or musical inclination desirable. Salary competitive. References please. Nicole Jordan and David Herrup, Warrenville, 393-3970.

BENEFIT NOTE

BREAST CANCER SCREENING

Fermilab is again offering on–site mammography screenings for employees, retirees and spouses. When breast cancer is discovered in its earliest stages, it is nearly 100 percent curable.

Fermilab will use the services of Delnor Community Hospital, who will set up a portable unit in the Northwest Conference Room on the 15th Floor of Wilson Hall. Temporary "walls" will be used to ensure privacy. The screening will be administered by skilled female technologists.

Delnor staff will be on site Thursday, February 13 from 11:30 a.m.—1:30 p.m. to schedule the mammograms. A table will be set up in the Atrium just off the cafeteria (near the 1 West Conference room) where you will complete a consent form and a brief medical history. Men may register their spouses. To speed the registration process, forms will be available ahead of time; forms can be picked up in the Benefits Office (WH15W) and completed prior to registration.

Screening dates are March 3—March 7; screening times are Monday, Wednesday and Friday, 8 a.m.—5 p.m. and Tuesday and Thursday, 8 a.m.—3 p.m.

Questions? Call the Benefits Office, x3395 or x4362.

MILESTONES

BORN

[redacted]

To Tom (Beams / ES&H) and Kym Conboy.

Photo © Jack Mitchell

An Evening of Solo Piano: PHILIP GLASS

An evening of solo piano with Philip Glass is a rare opportunity to experience a more personal view of this important American composer. Debuting an all new program of compositions for piano, this concert reveals the intricacies of Glass's style in its most elemental form. Simultaneously stirring and meditative, this event provides a fond reacquaintance as well as it does a perfect introduction.

Fermilab welcomes this rare event to Ramsey Auditorium on Saturday, February 22 at 8 p.m. Tickets are $17 and available through our box office at (630) 840-ARTS.

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Fermi National Accelerator Laboratory

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

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