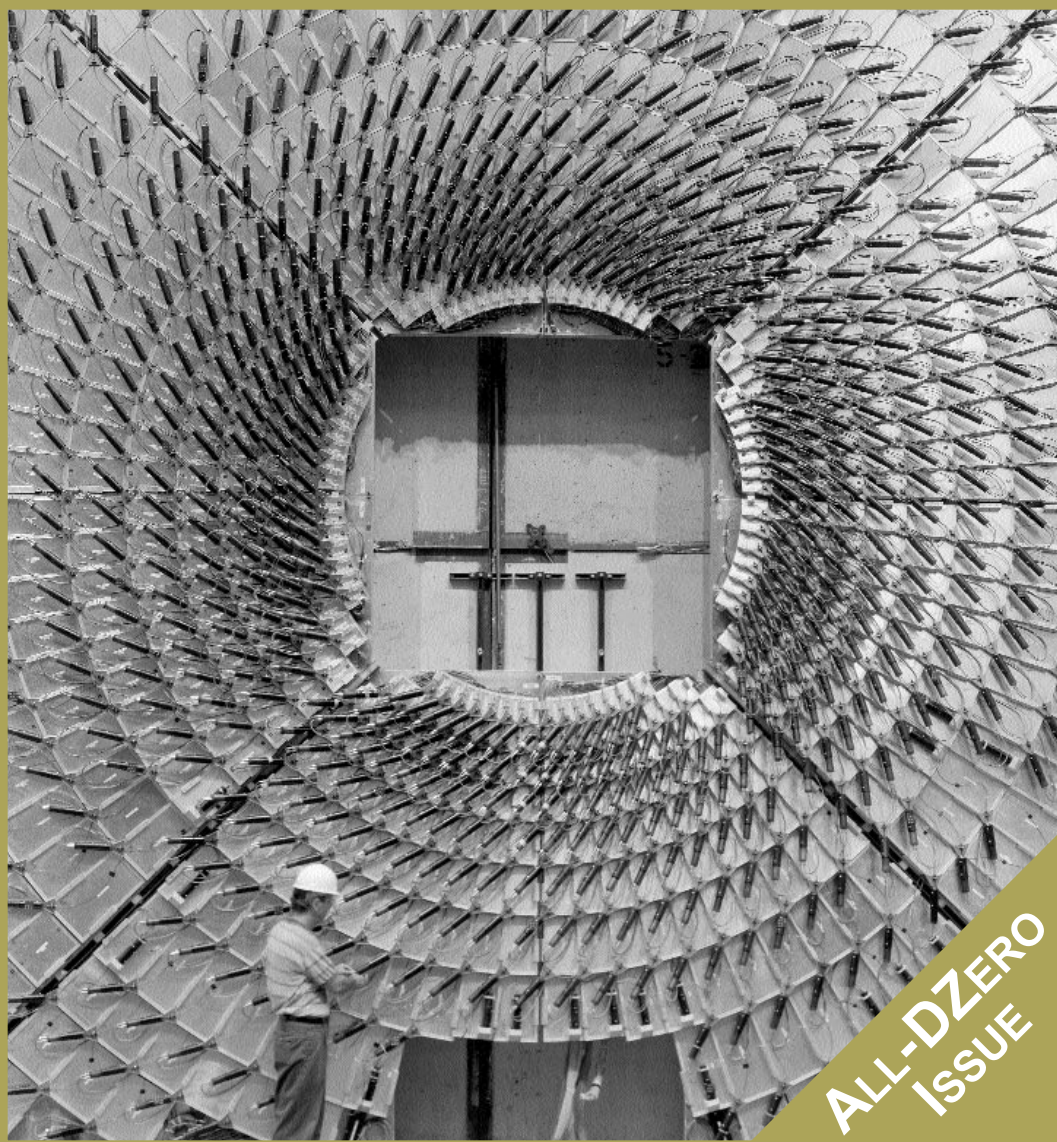


F E R M I N E W S

F E R M I L A B

A U.S. DEPARTMENT OF ENERGY LABORATORY



**ALL-DZERO
ISSUE**

Photo by Reidar Hahn

Volume 23
Friday, September 15, 2000
Number 16



INSIDE:

- 2 Forward Muon System
- 6 Profile in Physics: Delmar Miller
- 8 Around the World via DZero
- 10 Russian Students Pitch in at DZero
- 13 Talk of the Lab

'Best time to have a spoon is before lunch'

DZero Forward Muon
System a key utensil for
scooping up Run II
discoveries



The DZero forward muon system trigger detector (one of 4,608 of them), where a decision is made within 100 nanoseconds: "Is there a muon in this event?"

Cover photo: Completed plane of muon trigger detectors at DZero.

by Mike Perricone

Fermilab physicist Dmitri Denisov, who grew up in Russia, likes to cite a favorite old Russian proverb: "The best time to have a spoon is before lunch." Or, if you want to eat, make sure you have something to eat with.

It's a rich image with a distinctive cultural slant on all those finger-shaking admonitions your grandmother gave you: Do your homework. A stitch in time. For want of a nail. Look both ways.

In particle physics, the muon is the homework, the stitch, the nail—and the spoon. If you want to feast on the rich soup discoveries that will be served up by Collider Run II of the Tevatron, make sure you have utensils—and make sure they're the right utensils. You can't eat soup with a fork.

The muon, fat and long-lived cousin of the better-known electron in the lepton family, is an important "tag" used by physicists in tracing decay processes back to their origins—origins that might include new discoveries. Every part is critical in a 5,500-ton detector with a million electronic data channels, but the upgrade for the DZero Forward Muon System fills an essential role in the 500-member collaboration's ability to conduct sound particle physics experiments.

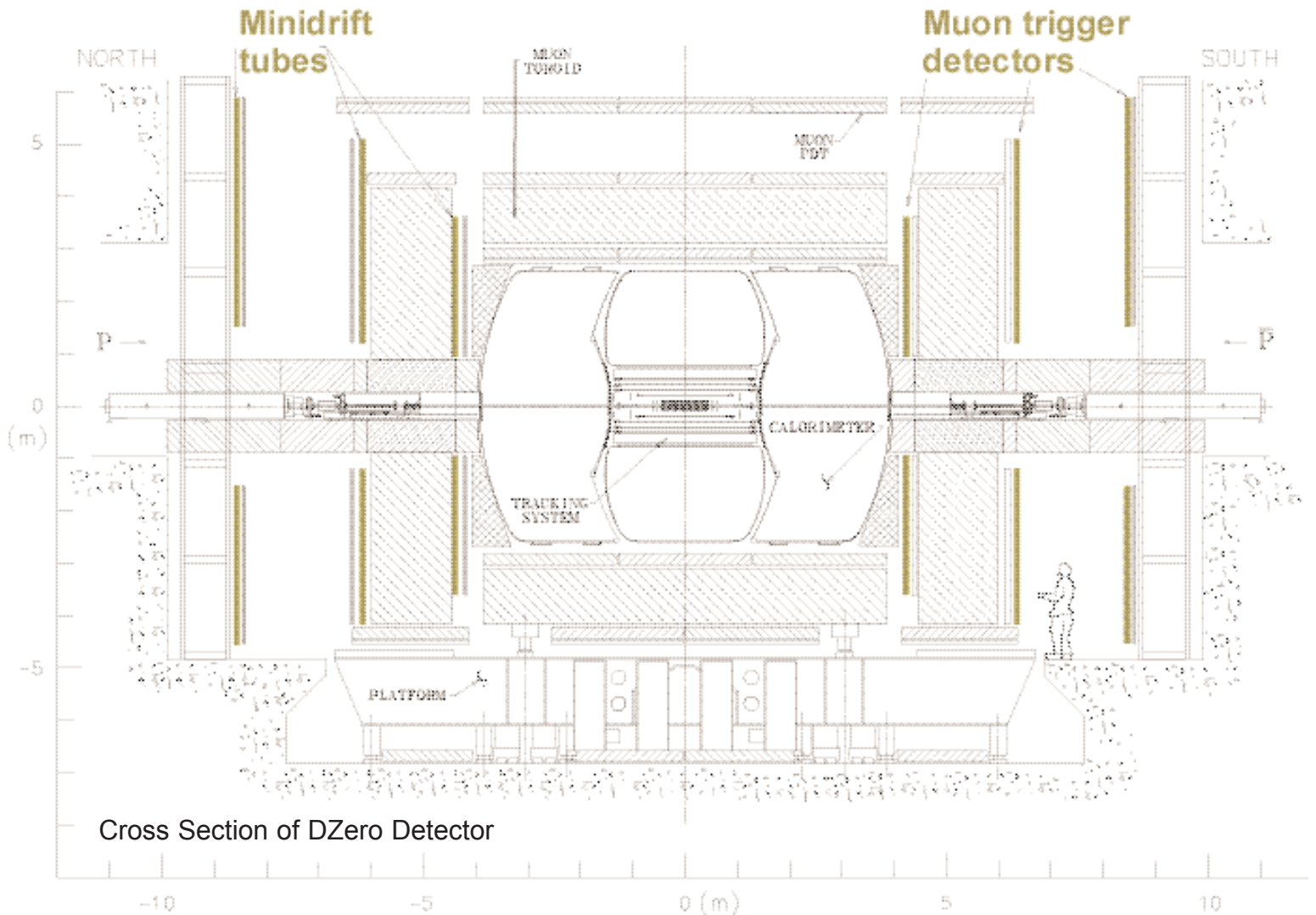
"Muons and electrons are the only charged leptons which can easily be identified in a particle physics detector," explained Harry Weerts, project manager for the complete DZero upgrade, co-spokesperson for the collaboration, and a professor at Michigan State University.

"The only other charged lepton that exists is the tau," Weerts continued, "but the tau lives fast and dies young. It decays before you can 'see' it, so you are left with electrons and muons. For that reason, essentially every detector in particle physics MUST be able to identify and measure muons and electrons."

The muon system tracks and measures the behavior of muons in the detector's magnetic field. Muons are heavy; their mass is about 106 million electron volts (MeV), compared to about 0.5 MeV for the electron. In relativistic terms, muons are comparatively long-lived at 2.2 microseconds (millionths of a second). They have the mass and lifetime to penetrate great thicknesses of absorber material within a detector without losing much energy or experiencing any significant change in trajectory.

When all the other decay products are absorbed in the central areas of the detector, muons are left traveling to the detector's outer reaches, about 10 meters (33 feet) from the collision region. The muon systems, located symmetrically at each end of the big detector, chart the direction and energy of these emergent final products, then mathematically reconstruct the trail back to their origins.

DZero Forward Muon System

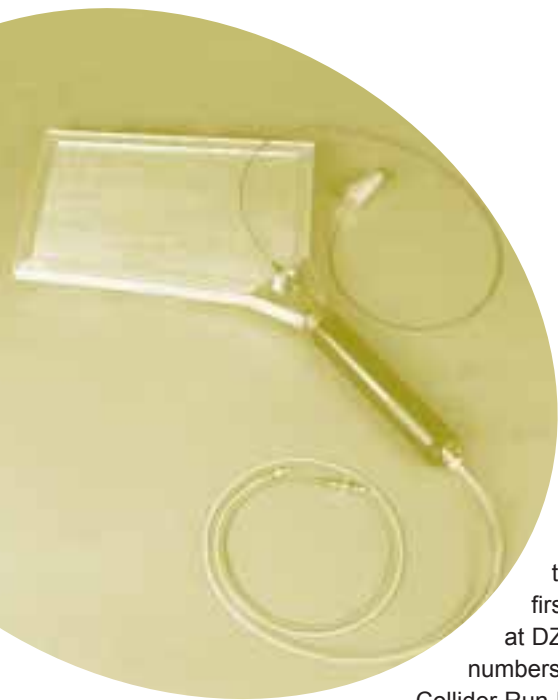


Cross Section of DZero Detector

“In other words, a muon is a sign of an unusual state of matter produced in the primary proton-antiproton collision inside the DZero detector—which is most interesting, of course,” said Leonid Vertogradov with a physicist’s characteristic understatement.

The DZero forward muon system project has a distinctive Russian cast to it. Denisov is the project manager. Vertogradov is one of 16 members of the

group from the Joint Institute for Nuclear Research in Dubna, near Moscow. The group, led by Gena Alexeev, was the key player in designing and fabricating the minidrft tubes, one of two detector types in the muon system, a six-year, \$3.5-million project. The minidrft tubes reconstruct an event, while the trigger detectors, built at the Institute for High Energy Physics at Protvino in Russia, identify an event.



The forward muon system assembly was completed on-time on August 24, closing the circle begun in 1994 with the first discussions of a new concept at DZero for handling the increased numbers and rates of collisions in

Collider Run II of the Tevatron. The large-scale production of muon system components began in 1998 at Dubna and Protvino, and at Fermilab. The total surface area of the two systems—trigger detectors and minidrifter tubes—covers some 800 square meters, or nearly two football fields. Together, they weigh 50 tons.

“These are large, very precise detectors,” Denisov said, “built on a very limited budget on a very short time scale in different places in the world.”

But not without headaches. Because reality is usually wackier than proverbs, and even with Fermilab’s institutionally ingrained microscopic vision for detail—all the spoons and stitches and homework—there were still some outside-the-box migraines:

- a key precision-machined component—the 20-foot-square ultra flat aluminum detector frames, with tighter tolerances than aircraft parts—was up when the manufacturing plant in northern Wisconsin shut down during November, 1999 for the deer season;
- the Russian government made an overnight sea-change in customs regulations, while a container of components headed for assembly in Russia was caught in mid-Atlantic and had to be re-routed for dockside storage—in Finland, in January;
- one of the world’s major electrical suppliers suddenly found itself unable to maintain the quality of gold-plated wire—because of one person changing jobs.

“It was the best deer season in years. We couldn’t reach anyone at the company, everybody went deer hunting for a couple of weeks,” said Denisov, summing up the first headache and going on to the others.



Octants of minidrifter tubes in waiting at Lab F...



Photos by Reidar Hahn

...where Vladimir Malychev works on the testing.

“When the Russian government changed the customs regulations,” Denisov continued, “we were able to hold the container of Russian built components in Finland in the cold for two months. We were keeping our fingers crossed while we got new paperwork done, but everything survived the cold. We couldn’t have done it without great work from Fermilab Shipping and Receiving, from Purchasing and from all the DZero secretaries.”

The shipping was one of the few glitches in the Russian connection, and it was unrelated to the collaboration’s top-notch technical work.

“In 1997, people were skeptical about shipping major detectors to be built in Russia,” Denisov admitted. “We didn’t know the future of the political situation and we were concerned. But Russia provided the equipment. Everything was done on budget and on time. Russia also provided funds, about \$350,000, mostly from Dubna and Protvino.”

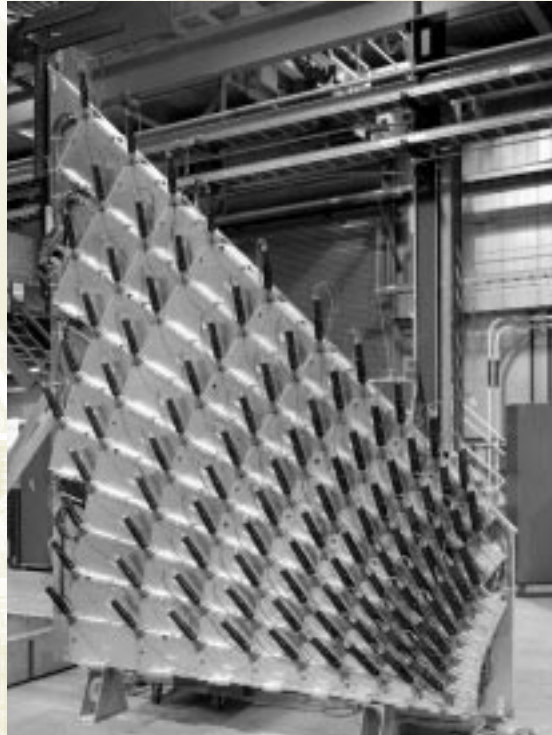
And as for the other headache, that big company with the famous name?

“That last problem,” Denisov said, somehow still smiling. “We bought about 250 kilometers, or 160 miles, of 50-micron gold-plated wire, which we’d bought from this company for many previous experiments. But when we shipped this wire to Dubna, Russia, for assembly, the gold was peeling off. After three or four months of trying to figure it out, we went to the company and learned that the engineer in charge of that particular operation had left after more than 15 years, and they weren’t able to make the wire the same way he had always done it. But they kept trying and solved the problem.”

The mindrift tubes—in effect, a coordinate system using some 50,000 lengths of that gold-plated wiring—reconstruct the tracks of the muons and measures their momentum when they strike the tubes, with the wires recording the change in electrical conductivity of the gas within. The mindrift tubes are also called “larocci tubes,” after the Italian physicist who developed detectors of this type suitable for mass production about 25 years ago. They are made up of individual cells (1/2 inch by 1/2 inch by 20 feet in length), which measure the position of a muon crossing the wires to an accuracy of 500 microns (millionths of a meter). An electronic chip (produced in Belarus) amplifies the signals from each wire of the tube.

The trigger detectors, using scintillation counters, must observe each particle event very quickly (within 100 nanoseconds) decide, “Is there a muon in this event?” They were built at IHEP-Protvino by a group led by Sergei Denisov (father of Dmitri Denisov). Individual detectors are overlapped to form a continuous plate in a “fish scale” design adapted by Valery Evdokimov of Protvino, and Fermilab’s Andrew Stefanik of Particle Physics Division’s Engineering and Tech Teams. There are 4,608 individual scintillation counter detectors, combined into eight “octants” which are assembled into a circular plane. In all, there are 96 octants, 48 for each type of detector, making up six complete sets.

The triggers and mindrift tubes are paired up and installed at the DZero detector in three layers: one layer in front of the muon toroid magnet, and two behind the magnet. Octants were assembled at Fermilab’s Lab F, which needed a new door to handle the size of the frames and completed components. The Surveying Group made the



Photos by Reidar Hahn

An octant of muon trigger detectors at Lab F (left). Valery Evdokimov and Igor Schvabovich undertake the painstaking process of testing each counter.

critical measurements for accuracy using optical targets affixed to the frames. Detectors were mounted on the support frames, covered with a protective skin, and then fitted with cables and electronics for testing and calibrating at Lab F.

The completed project celebrated not with lunch and a spoon but with a party, a fitting scene for that Russian toast, which translated literally, means “For everybody, health!”

“In two short words,” said Denisov, “you can express a lot to your friends and colleagues, and to the experiment itself.”

Na zdorov’e! ☐

Rolling the credits...

In all, nine groups participated in the DZero Forward Muon System project: Fermilab, IHEP-Protvino, JINR-Dubna, Northern Illinois University, Northeastern University, Boston University, University of Arizona, University of Washington, and a group from Prague, Czech Republic.

Forward muon system project manager Dmitri Denisov cited invaluable contributions from Muon Group co-managers Tom Diehl, Ken Johns and John Butler; from Darien Wood’s group at Northeastern University and Henry Lubatti’s group at the University of Washington, as well as the Fermilab engineers Andrew Stefanik and Anthony Levand; physicists Linda Stutte and Ai Ito; and the DZero technical support group.

“We had large groups from different universities, labs and countries,” said Denisov, “with people ranging from distinguished professors to graduate and undergraduate students to high school teachers taking their turns to work with tools. And we always felt strong support from the collaboration management, the Particle Physics Division and the Fermilab Directorate.”

Delmar Miller: The Man Who Gets Paged 30 Times a Day

by Kurt Riesselmann

He has worked at Fermilab for more than thirty years. He has worked in every accelerator tunnel on site. And he has helped to install numerous beam lines and detector components. Yet one struggles to find a picture of Delmar Miller posing in front of any equipment.

"We had to work hard to get a picture of him in front of the DZero detector when he and his team completed the fiber tracker installation in July," said Reidar Hahn, photographer of Fermilab's Visual Media Services.

For Miller, it's important that the job gets done and that Fermilab's projects are on schedule. Personally, he prefers to stay out of the limelight, always giving credit to colleagues and his group of technicians.

Miller's job title is Operational Specialist Senior, and he leads a team of 35 mechanical support people that work on the assembly of the DZero detector. Titles, however, don't mean a thing to him.

"Your performance defines you, not your title," says Miller, who is legendary for his uncompromising zeal.

He has been working for the DZero collaboration since 1985. For one of his first projects, he worked with Jim Christenson on the end cap calorimeters of the DZero detector, modules that measure the energy of particles that leave the detector in forward or backward direction. His contributions received much praise, and his rigorous approach made him well known.

"We cannot even imagine what DZero would be like without Delmar Miller," said Harry Weerts, co-spokesman of the DZero collaboration. "He knows Fermilab inside out. He knows how to get things done."

Delmar Miller is supervisor of nearly all the technicians of the DZero group at Fermilab. He and his team have been essential in putting the DZero detector together, assembling and installing detector components, small and large.

"Miller is in charge of anything going on in the DZero detector area," Weerts said. "With his experience, he has provided a lot of input in the implementation of the detector construction."

Communication is an important aspect of Miller's job. Coordinating the installation of detector parts, which get shipped to Fermilab from various universities and high-energy physics institutions around the world, is critical to meeting DZero's schedule.

"E-mail is a wonderful thing," Miller asserts. A pager, of course, is also one of his basic tools. Colleagues estimate that Miller gets paged 30 times a day.

Delmar Miller plays an important role in making the DZero upgrade proceed as smoothly as possible.

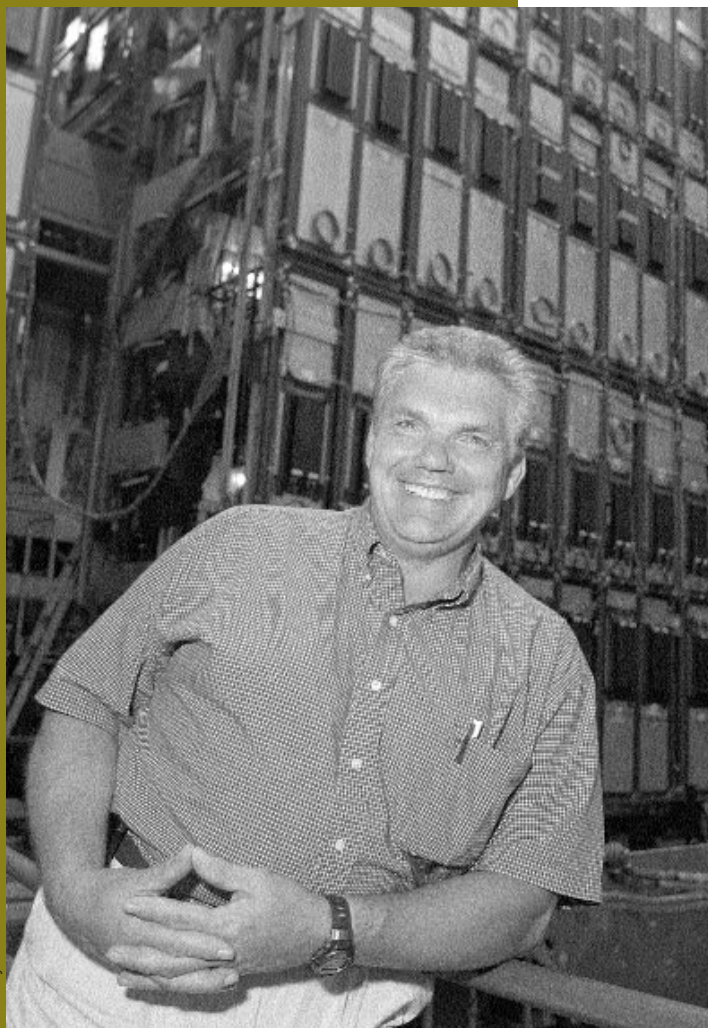
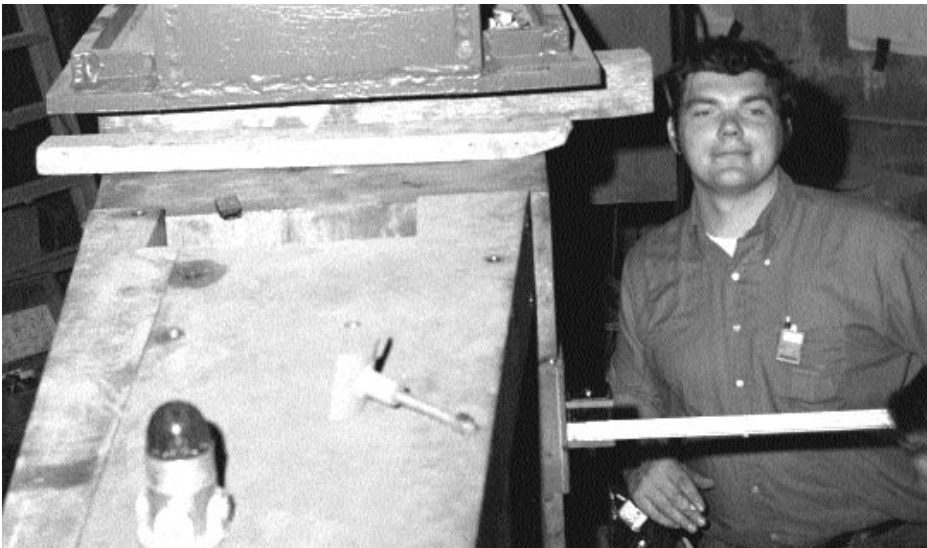


Photo by Reidar Hahn



Fermilab photo

PROFILE IN PHYSICS

During his early days at Fermilab, Delmar Miller worked on surveying and aligning accelerator beam lines.

Though talking to colleagues is a basic requirement for scheduling work in the detector hall, Miller is happy not to “live in a meeting world.” He is glad if he can skip a meeting, relying on co-workers to brief him on details. As a matter of fact, Miller is a man who prefers to take action than to discuss solutions.

“Many years ago, I worked with Delmar on fixing a muon beam line,” said Peter Limon, head of Fermilab’s Technical Division. “Its performance was terrible, and we were there to make it work. As Delmar worked on surveying and aligning the magnets, one high-pressured cooling hose came off, spraying water all over the place. While everyone else was still watching, Delmar grabbed the whipping hose and somehow managed to put it back on. He didn’t care that he got soaking wet. Something needed to be fixed, and he fixed it.”

Miller joined Fermilab in 1969 because of the wonderful things a friend, who worked at the lab, had to tell. Supervisors quickly recognized his superb technical skills, quickly solving any problem that occurred. He became one of the first members of the Alignment Group, a special team created by Fermilab’s first director Robert Wilson. The group was responsible for beam lines of all accelerators and experiments.

Once, Miller even saved an experiment when its malfunctioning electronics caused a fire. He happened to be working in Lab C when the fire started. Quickly assessing the situation, he asked everyone to leave the area, grabbed a fire extinguisher and stopped the fire.

“Later, the firemen complained that I used the wrong type of extinguisher,” Miller laughs.

To this day, Miller takes a lot of pride in helping Fermilab as much as possible to achieve its goals. And he receives a lot of respect from his colleagues.

“He is one of the people that really care about Fermilab,” said Limon.

Presently, Miller and his team focus on getting the DZero detector ready for taking data during Run II, which starts in March 2001. To achieve that goal, they have taken over jobs that, originally, were never planned to be on their plate.

“You can’t foresee every single detail,” Miller points out. “In every project of this complexity, there are bumps in the road. We just make sure that they don’t delay the project.”

So far the DZero project is on schedule. Miller and his team will work hard to keep it that way. □

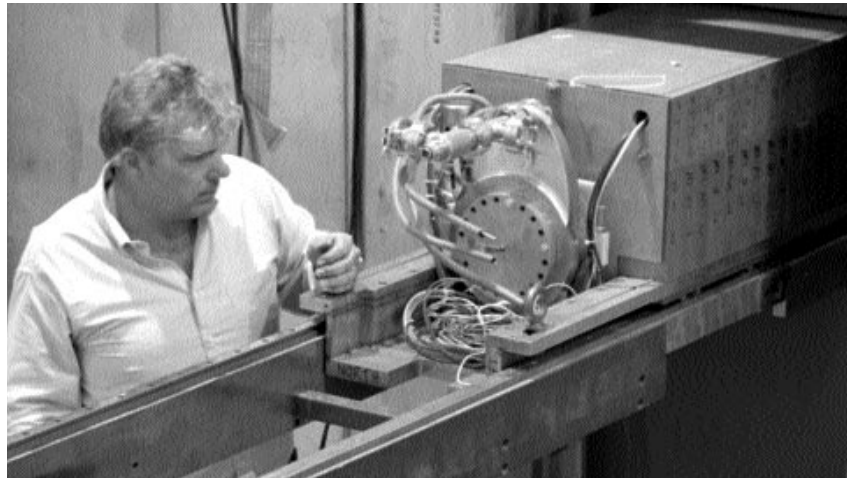


Photo by Reider Hahn

Practical and creative ways of problem solving are Delmar Miller’s trademarks.

Around the World

via DZero

by [James Ferricone](#)

At home, in their own part of the world, they saw themselves as an ordinary, busy family with two jobs, two children, and not enough time to enjoy all they worked to achieve.

But in less-familiar realms of the world, they often found themselves regarded as something very special, indeed:

- a symbol of the privileged enemy, arriving in Iran amidst a national celebration of the 20th anniversary of the 1980 hostage episode;
- potential candidates for hostage-taking themselves, during an attempted political coup in Fiji which, fortunately, evaporated before they were entangled;
- a target for bandits, needing an armed military escort on an anxious desert crossing into Pakistan;
- an object of assaults by comically oblivious kangaroos, who caromed off the front fender of their camper as they were jouncing along in the Australian outback at night;

DZero physicist Gergorio Bernardi, his wife Marie, and their children, Jeremy, 13, and Sonia, 10, are now back in France after a year-long trek around the world by camper, an experience unreplicated by theme park or “reality-based” TV.

“We left France a year ago with two kids,” said Greg Bernardi, “and now we come home with two almost-adults. It’s amazing to see how they changed, how they matured in a year.”

Greg, a physicist at the University of Paris, had been participating in experiments at DESY, in Hamburg, Germany, as well as DZero. In early 1999, he was presented with the opportunity to join DZero full-time in software and analysis for Run II in March 2001. He and Marie, who teaches English at the 10 to 14-year-old age level, decided to seize another opportunity: in France, a professional can take a year off without pay.

They had rented a motor home in the U.S. and driven through the Rocky Mountains when Jeremy was about three, and often said they’d like to take another trip like it.

“Now the kids were getting older, and I was making a shift to Fermilab,” Greg said. “We decided, now’s the time to make the trip.”



Photo by Reidar Hahn

The Bernardi family gathers around their mobile living quarters of the last year: from left, Jeremy, Greg, Sonia, and Marie. They stopped at Fermilab for a rest and a visit (and a photo) before hitting the road for New York and then home.

Compiling their photo album wherever they went, the Bernardi family were especially struck by scenes at the Khyber Pass, between Afghanistan and Pakistan, where they encountered a shop selling birds (left). Among their most memorable destinations was Lhasa, the capital of Tibet, where they saw a father and son using a prayer mill (second from left) and where Sonia's smile was also an attention-getter (third from left). Later, in Bombay, India (right), their camper van was loaded onto a flat rack container for shipping to Australia via Singapore.



They spent three months getting ready, planning their route, obtaining visas, borrowing to buy the camper, tying up loose ends. Then they set out—not west, by way of the U.S., as many family members and friends advised: but east, toward Asia. Starting their drive through Italy and Greece, they journeyed through Iran and Pakistan, Nepal and Tibet, India and Malaysia, before driving across Australia, where they saw the Olympic Torch complete its own round-the-world journey.

“Our ambition was to go to India by the classic road taken centuries ago by European explorers and traders,” Greg said. “We also wanted to do the hard part of the trip first.”

Jeremy and Sonia had an additional agenda: a year off from school. It turned out quite differently from what they expected. Greg and Marie set aside three hours a day for tutoring (Greg in science, Marie in everything else), with monthly status reports mailed back to the schools.

“It’s tough to teach your own children,” Marie admitted. “You don’t have the same patience you have in a classroom. It was OK at the beginning, but after a while they said they wanted to go back to school. I told them when they do go back, I don’t want to hear complaining about school.”

Geography was a constant part of their education, but cultural differences made indelible impacts.

Marie found that she and Sonia were required to be covered in dark clothing from head to foot while traveling in Iran, viewing the world through a narrow gap in the veils over their faces. Jeremy

and Sonia despaired over the poverty they witnessed, especially the numbers of impoverished and disabled children in India.

“It was very hard for them,” Marie said. “But they also learned how little many people have.”

The camper itself was an education. The good news was being together as a family 24 hours a day, for an entire year. The bad news was being in a space some 20 feet long by five feet wide.

“Four people, four different temperaments, not used to being together all the time, crossing difficult countries—at the beginning it was very tough, but then it was nice,” Marie said. “It drew us together.”

On August 9, the Bernardis pulled in to the parking lot at DZero. After stopping at Fermilab for a brief stay on site, they drove to New York, where they shipped the camper across the Atlantic before flying home.

Heading home also offered an easier connection with some of their experiences. Time and distance provided a larger context for their memories and impressions. They were surprised to find that, as difficult as they had found the deprivations they saw in India, the splendors they had witnessed there now became foremost in their minds and in their conversations.

“Now we all think India was fascinating, and we’d like to go back,” Marie said. “But for now, we’d like to go back to normal life, back to the routine. A year is enough.” □



Mission from Moscow

RUSSIAN Students

by Kurt Riesselmann

Summer time is prime research time. Physicists from all over the world come to Fermilab to work on their experiments. Professors and students alike enjoy the opportunity to turn their backs on the classroom and get their hands dirty turning wrenches and connecting cables.

And it can mean a trip to the other side of the world.

Five students from Russia have joined the hundreds of physicists working at Fermilab this summer. Russian scientists started visiting Fermilab in the 70s, but this marks the first time that several Russian students have joined them to work on the DZero collider experiments.

"We are very pleased to see these students joining our experiment," said Harry Weerts, co-spokesman of the DZero collaboration. "Senior Russian physicists have contributed a lot to DZero and to Fermilab. Until this summer, students have been missing from the mix. Having them at Fermilab will give them access to the unique physics potential of the Tevatron, and it will help to maintain a top physics education program at their home institutions."

Sergei Denisov, long-time DZero collaborator, worked hard to make the student's trip possible. Denisov, physics professor at Moscow State University and department leader at the Institute of High Energy Physics in Protvino, Russia, is a member of the prestigious Russian Academy of Science.

"The five students are all from Moscow State University," Denisov said. "They all attended my lectures, and they are among the best."

Alexandr Klimenko and Kirill Lugovsky are two of the five students that traveled across the world to spend their summer at Fermilab. Back home, at IHEP, they worked on scintillating counters that will be used for particle identification at the DZero experiment (see story on page 2). When scientists at IHEP shipped the counters to the United States, Denisov decided Klimenko and Lugovsky should have the chance to continue their work on the counters' assembly and installation in the DZero detector.

With help from other IHEP scientists, Klimenko and Lugovsky prepared and tested the hardware for the counters, whose main components are tiles of scintillating plastic and photosensors.

"Six layers of scintillation counters will eventually be installed in the DZero detector, three on each side of its center, perpendicular to the beam line," Klimenko explained.

Charged particles crossing the scintillating material create a short pulse of light that is detected by the sensors, creating an electrical signal. DZero

pitch in at Δ -HOAb DZEROØ

physicists use these signals for triggering the readout of other detector components, like wire chambers, that determine particle tracks more precisely. The proper functioning of the scintillation counters is a crucial step in DZero's chain of data collection.

STUDYING IN MOSCOW

Klimenko and Lugovsky started studying physics at Moscow State University in 1997. Each year, more than 2000 students apply for the renowned physics program at MSU. No wonder: Physicists from MSU have received a total of five Nobel Prizes.

"Only 400 students per year are accepted," says Lugovsky. "Those that survive the selection process receive an MSU stipend that covers essential living expenses." When joining the program, Lugovsky said, he had no idea that his physics studies would take him to the United States.

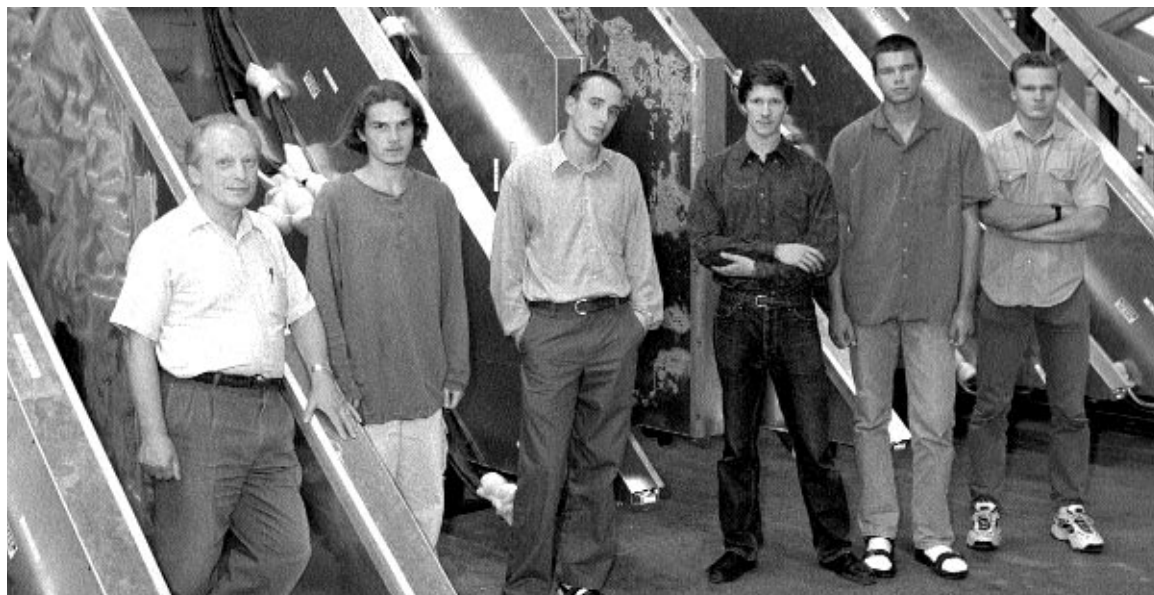
By 1999, both Klimenko and Lugovsky had decided to specialize in high-energy physics. They continued their studies at the IHEP institute, also known as Serpukhov. It is home to a 70 GeV proton accelerator, which is used for studying quark-antiquark bound states, neutrino interactions and many other particle physics phenomena. In addition, IHEP is engaged in R&D for detector and accelerator technology.

The Russian students are the newest example in a long, strong tradition of Fermilab-Russian collaboration. The first experiment ever done at Fermilab was as a Fermilab-USSR collaboration, in the early 70s, in the depths of the Cold War. Since then, legions of Russian physicists have brought their distinctive and respected Russian style of physics to the laboratory.



Alexandr Klimenko and Kirill Lugovski (background) work on connecting photomultipliers for scintillating counters that they helped to build back home in Moscow.

Photos by Jenny Mullins



Photos by Jenny Mullins

Sergei Denisov (left) is physics professor at Moscow State University. He arranged for five of his Russian students to work at Fermilab this summer: Kirill Lugovsky, Andrey Kubarovsky, Alexandr Klimenko, Petr Nomokonov and Denis Zotkin. They stand in front of modules of scintillating counters, now being assembled and placed inside the DZero detector.

DZERO



Aurelio Juste (left, standing behind Bill Kahl) is responsible for the 10-percent-test of the DZero silicon tracker. Juste worked with one of the Russian students.

Δ -HOAb

THE 10-PERCENT TEST

Moscow State students Petr Nomokonov and Denis Zotkin spent their summer working on the DZero silicon tracker. Nomokonov helped construct the disks with silicon detectors for tracking particles in the forward direction of the DZero detector, very near the proton-antiproton collision area.

Zotkin worked on assembling the “10-percent test” located at Fermilab’s Silicon Detector Facility.

“We will be testing 10 percent of the readout channels of the whole silicon tracker,” Zotkin explains. “I wired up and labeled the whole high voltage system. Now I help testing readout modules. By now, I am familiar enough with the readout system as to actively help on the debugging and running.”

Fermilab physicist Aurelio Juste is responsible for the 10-percent-test. He supervised Zotkin’s work, and he is delighted.

“Working with Denis has been one of the best experiences this summer,” says Juste. “In practice, we set up the equivalent of a small fixed-target experiment in terms of complexity and number of readout channels. That meant working late, even night and weekend shifts. Denis was a great help, and I’d love him to be a full-time member of the 10-percent test.”

The 10-percent test started recording data at the end of August, and testing will continue until November. Back in Moscow, Zotkin will be able to continue working on the readout software via Internet.

FAMILY HERITAGE OF PARTICLE PHYSICS

Zotkin comes from a family closely tied to particle physics. His father is professor at Moscow State University and works on the Zeus experiment, which uses the electron-proton collider at the German high-energy laboratory DESY.

Nomokonov’s family also has a particle-physics history. He is the second member of his family working at Fermilab.

“In 1975, my father spent one and a half years at Fermilab,” Nomokonov says. “He worked at the Joint Institute for Nuclear Research in Dubna, Russia. He and several of his colleagues visited Fermilab to help measuring proton-proton scattering cross sections.”

The fifth Russian student at Fermilab is Andrey Kubarovsky. He works at the Computing Division, programming physics analysis tools. Like his fellow students, he spent about two months at Fermilab.

Though the summer has meant hard work and little playing time, the Russian students fondly remember the highlight of their non-physics activities.

“Professor Denisov took all of us to the Niagara Falls,” Zotkin remembered with a smile. “It was wonderful!” □

the

NOT JUST ANOTHER PRETTY DETECTOR.

Let's face it. CDF gets all the ink.

Sometimes it seems positively unfair. Just because older sister CDF, Fermilab's first collider detector, arrived earlier on the scene, does that mean she can act like an only child forever?

Right up front, there's the issue of photogenics, if that's the word for a long-term love affair with the camera. CDF has always had those drop-dead good looks. The blue, the red, the yellow, the silver.... When people walk into the CDF assembly hall and see the detector for the first time, they say "Ooh!" and "Do all those cables really connect to something?"

Conveniently, CDF has a visitors' viewing gallery, the better for VIP's and reporters to hang over the pit and ogle the five-ton glamour-puss CDF detector. So handy.

CDF gets on the cover of the physics equivalent of *Vogue*—*Physics Today*.

Not DZero. DZero looks like a big metal tank. The kind you might find buried beneath your corner gas station. An off-white metal tank. What happened? Did they run out of high-gloss paint when they got to the detector across the ring?

True, DZero has wonderful, wonderful things inside: beautiful trackers and solenoids and chambers and calorimeters—gorgeous calorimeters—and silicon. Fantastic stuff. And true, as your Mom told you in junior high, it's what's inside that counts. Absolutely. No question. But when was the last time you saw DZero on the cover of anything? (Sure, *FERMINES*, but that's like making the cover of your Mom's photo album. She loves you no matter what you look like.)

Even schoolchildren think CDF looks better than DZero. CDF posters outsell DZero posters five to one with the kids. And with the teachers.

If CDF is the Maserati of particle detectors, what's DZero? The Step Van?

Then there's the real-estate thing. Once again, CDF's got it all: location, location, location. Time and again, the tour for the senator, the congressman, the secretary includes a stop at close-

to-the-High-Rise CDF, easy-on, easy-off

CDF — a n d a stop at DZero "if time permits."

Somehow, time never does seem to permit. It's so FAR over there, and the congressman has a plane to catch.

CDF staked out Park Avenue, and DZero got stuck out in Queens.

When you do arrive at the DZero assembly hall, forget about the heart-stopping vista, the admiring gasp. Yes, DZero does have a catwalk, if you know where to find it, but the view it affords does not inspire a grab for the camera.

It would seem as if CDF got it all: the looks, the great address, the old-line pedigree...

But, as Serena once said to Venus, don't write the younger sister off quite yet.

DZero speaks up for itself. From the beginning, DZero collaborators understood the value of making themselves heard. It's as if they knew they had to do something to hold their own, with CDF vamping over there across the ring. They learned to communicate.

of

the



They put their papers into plain English, so that non-particle physicists could read them. They invited the public to their Web site. They explained to anyone who would listen why physics is good for the country. They knocked themselves out to tell their story to the world.

And they came up with great story ideas: “Fiber Tracker Hits the Road,” “Searching for Magnetic Monopoles,” “Sleuth, the Model-Independent Software,” “No Branes Found Yet at DZero,” “Return of the Banished Indians,” “Muon Chambers,” “Russian Students”...

Ya gotta love a collaboration that works so hard to explain itself. For this edition of FermiNews alone, DZero collaborators came up with so many interesting story proposals that eventually the editors threw up their hands and decided to go for an all-DZero issue. It seemed like the only thing to do.

True, next issue, CDF will be back in the limelight. As FermiNews goes to press, CDF is rolling into the accelerator—first, of course—for the engineering run that leads up to Run II. Once again, CDF will be turning its best profile to the camera for a few more glamour shots.

But, if experience is any guide, we haven’t heard the last from DZero. In fact, most likely, we ain’t heard nothin’ yet.

—Judy Jackson

DOG STORY

In the pre-history of the Collider—in1981—Leon called for ‘small clever’ proposals for the D0 intersection region. There were about a dozen proposals. One of them was LAPDOG submitted with Mike Marx and me as co-proponents. Institutions included Brookhaven, Brown, Columbia, Michigan State, Stony Brook. The name was actually an acronym for something, but was also a bit of a spoof on pretentious names for experiments.

My next-door neighbor in Stony Brook is George Booth, a cartoonist who does things for *The New Yorker* and other magazines. I asked George if he could do a cartoon of his well-known dog as logo for the proposal, which he did (copyright presumably given to me for use).

In time, the Physics Advisory Committee decided not to approve any of the proposals, instead asking for a new collaboration to form amalgamating ideas from several proposals. Leon asked me to serve as spokesman for the nascent collaboration. Finding a new name for the collaboration was a hot topic in the early days—certainly many people did not like the LAPDOG theme, and also not the dog logo. With all the new personalities trying to



come together from different quarters, it did not seem wise to push the canine theme, so the name became—in least common denominator fashion—D0, after the location of the experiment in the ring. Nevertheless, the doggy aficionados continued to push the

dog thing a little, and it showed up on the first isometric drawing of the D0 detector to give the scale of the experiment. (That was partly inspired by Ryuji Yamada, who always seemed partial to doggy-hood.)

When in time, D0 was built and we had to have more office space in the form of the portakamps near the D0 Assembly Building, Hans Jöstlein decided to add the decoration. Hans is accomplished in many ways, one of which turned out to be woodworking, so he blew up the original drawing of the Booth Dog, and jigsawed it from plywood, painted it and attached it to the portakamps. Its been there ever since; one subsequent repainting, and now delaminating from the weather.

—Paul Grannis

CALENDAR

Fermilab Arts Series

NOW THEN AGAIN

Saturday, September 16, 8:00 pm. Tickets are \$20. Ramsey Auditorium, Wilson Hall. This romantic comedy, set at Fermilab, has been delighting sold-out Chicago audiences since its debut last spring at Bailiwick Repertory Theatre. A love story about two scientists who fall in love at Fermilab provides proof that relationships are usually complex and quantum mechanics can be simple.

ONGOING

■ NALWO is pleased to announce that the free morning English classes in the Users' Center for FNAL guests, visitors, and their spouses have been expanded. The schedule is: Monday and Thursday, 9:30 am - 11 am beginners (Music Room) and intermediates (Library), Monday and Thursday, 11 am - 12:30 pm advanced, emphasizing pronunciation and American idioms (Music Room).

Web site for Fermilab events: <http://www.fnal.gov/faw/events.html>

■ NALWO coffee for newcomers and visitors, Thursday, Sept. 21, at Housing Office (Aspen East) 10:30 a.m. - 12 noon.

■ In the auditorium, International folk dancing, Thursdays, 7:30-10 p.m., call Mady, 630-584-0825.

■ Fermilab Recreation Facility 2001 Memberships are available beginning September 1 in the Recreation Office, WH15W. Regular Membership - \$70.00; Student Membership - \$40.00 (visiting graduate students only). 2000 memberships will expire October 1. For more information contact the Recreation Office, x2548, 5427.

BOOK SALE

Fermilab will again sponsor a Book Fair, hosted by Books are Fun, in the Atrium on Wednesday, October 11 from 10:00 AM until 6:00 PM and on Thursday, October 12 from 7:00 AM until 3:00 PM. Savings of up to 70%. Pre-displays of some titles available on Monday, Oct. 9 in the Atrium.

FALL & WINTER MUSCLE TONING CLASS

SCHEDULE

<http://fnalpubs.fnal.gov/benedept/recreation/classes.html>

BARN DANCE SERIES

The Fermilab Barn Dance series, featuring traditional square and contra dances in the Fermilab Village barn, will start the season with a special Saturday dance 8:00-11:00 PM, September 16, 2000. The regular second Sunday evening dances will resume October 8 at a new, earlier time - 6:30 PM. Admission is \$5 for adults, \$2 for age 12-18, and free for under 12 years old. Come with a partner or without; bring the family or not. For more information contact Dave Harding (x2971, harding@fnal.gov) or Lynn Garren (x2061, garren@fnal.gov). Check our Web page (<http://www.fnal.gov/orgs/folkclub/>) for schedule updates.

MILESTONES

HONORED

■ With Fermilab Employee Recognition Awards: Alan Bross, of DZero; and Aseet Mukherjee, Bob Wagner and Avi Yagil, of CDF; on Aug. 23; by Fermilab Director Michael Witherell; for their significant contributions to the tracking system upgrades at the CDF and DZero detectors for Run II.

RETIRING

■ Gerald Jones, ID 204, BS-IS Information Technology, Sept. 29.

■ Alan Elliott, ID 4375, FES-OP-HVAC, Sept. 29.

■ Robert Kolar, ID 205, BD-AS-Cryogenic Systems, Sept. 29.

■ Ronald Olsen, ID 1061 PPD-Engineering & Tech Teams, Oct. 31.

■ Dennis McCormick, ID 4816, BD-AS-Cryogenic Systems, Sept. 6

■ Howard Fulton, ID 331, TD-Engineering and Fabrication, Sept. 13th.

HOLE IN ONE

■ By Joe Omalley (Beams Div.), on Thursday August 10th on the par 3, 165 yard, 2nd hole at Wolf Run Golf Club. Joe used a 7 wood. Witnesses were Nancy Kowalski, Sue Wilhem and Bob Brown.

CORRECTION

The year 1956 was mistakenly repeated in the neutrino timeline accompanying the story, "The Neutrino's Past and Future" (FERMINEWS, Vol. 23, No. 14, August 4, 2000, pp. 7-8). Left out was the year 1975: "A new lepton, the tau, is discovered by a group led by physicist Martin Perl at the Stanford Linear Accelerator Center.

Experiments performed shortly afterward provide strong evidence that there also exists a third species of neutrino, the tau neutrino. In 1995, Perl and Reines win the Nobel Prize for their discoveries." FERMINEWS regrets the error.

LUNCH SERVED FROM
11:30 A.M. TO 1 P.M.
\$8/PERSON

DINNER SERVED AT 7 P.M.
\$20/PERSON

Chez Léon MENU

FOR RESERVATIONS, CALL X4512
CAKES FOR SPECIAL OCCASIONS
DIETARY RESTRICTIONS
CONTACT TITA, X3524
[HTTP://WWW.FNAL.GOV/FAW/EVENTS/MENUS.HTML](http://www.fnal.gov/faw/events/menus.html)

LUNCH WEDNESDAY, SEPTEMBER 20

Lamb Curry with Apples
Basmati Rice
Spice Cake with Orange Curd

DINNER THURSDAY, SEPTEMBER 21

Acorn Squash Soup
with Ginger and Mustard Seeds
Shrimp and Crab Cannelloni
Salad of Field Greens
with Pears and Gorgonzola
Chocolate Souffle with Creme Anglaises

LUNCH WEDNESDAY, SEPTEMBER 27

Grilled Portabello Mushrooms
with Red Peppers and
White Bean Puree
Mixed Greens with Garlic
and Bacon Dressing
Lemon Cheesecake
with Blueberry Sauce

DINNER THURSDAY, SEPTEMBER 28

Mussels with Thyme and
Garlic in Wine
Duck with Wild Mushrooms
and Fig Sauce
Wild Rice with Roasted Corn,
Peppers and Spinach
Apple Walnut Cake

F E R M I N E W S

F E R M I L A B
A U.S. DEPARTMENT OF ENERGY LABORATORY

FERMINEWS is published by
Fermilab's Office of Public Affairs.

Design and Illustration:
Performance Graphics

Photography:
Fermilab's Visual Media Services

The deadline for the Friday, September 29, 2000, issue is Tuesday, September 19, 2000. Please send classified advertisements and story ideas by mail to the Public Affairs Office MS 206, Fermilab, P.O. Box 500, Batavia, IL 60510, or by e-mail to ferminews@fnal.gov. Letters from readers are welcome. Please include your name and daytime phone number.

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



CLASSIFIEDS

FOR SALE

- '97 Chevy Custom high top conversion van by Sterling, V8/350, 31K, black, excellent cond, 4 way power captain driver/passenger's seats, removable captain chairs and tri-fold power bench/bed, grey leather, real wood interior, clothes rack, bug shield, rain deflector, privacy curtain, window shades, mood/nightlights, VCR/TV/2 radio systems, defrosting side mirrors, PS/B, AC, new tires, hitch, security system. Asking \$19,990. Diana x3704.
- '95 Toyota Camry LE, California License, 65k miles, dark green, leather, auto, A/C, P/S, power windows, power locks, tilt wheel, cruise control, air bags, AM/FM cassette, in excellent condition. \$10,600 or best offer. Call 840-8196 or 4794. e-mail moshe@fnal.gov.
- '94 Honda Accord EX: 4-dr; dark green; 5-spd; A/C; ABS; pwr moonroof; pwr windows & door locks; alloy wheels; cruise; pwr driver's seat adjust; leather steering wheel cover; AM/FM cassette w/ 6 spkrs; more. High miles, but very well-maintained. No rust. \$5,700/obo. Call Barry at x2230.
- '94 Jeep Grand Cherokee Laredo 115,000 miles; white exterior; gray leather interior; V6 engine; anti-lock brakes; power windows, door locks, mirrors, seats; cruise control; AM/FM Stereo cassette; Infinity Gold sound system; automatic transmission; 4-Wheel-Drive(part time). \$9,500.00. Call Clay at 630-406-1213 or Merle at x3958.
- '93 Saturn, 125k, great shape, newer tires, new brakes. Good interior and exterior. Runs great, no problems. Blue book \$1850, make me an offer. Busch@fnal.gov x 6527.
- '91 Grand Am, 112k, see it in "Abandoned Car" lot between Blackhawk & Shabbona in Village. \$3,000 obo. 801-1775- leave message.

- '90 Jeep Cherokee Laredo 4.0L, 2 dr, red w/ gray interior, automatic, power windows, locks, AC, AM/FM/Tape, 94K miles, asking \$6,000, Call x8887 or 630-978-0481.
- '88 Toyota Corolla, Automatic, 103k miles, new battery, AM/FM radio, \$1,550 obo. 630-305-7139.
- Motorcycle: '96 Triumph Trophy 900 cc (British Racing Green) 9,500 miles excellent condition. Comes with matching helmet, rainsuit, tank bag, inner bags for saddle bags, cruise control and 12 volt receptacle. contact Merrill at 3011 or e-mail to alberetus@fnal.gov.
- Bicycle, good condition, with air pump \$35. Call 840-4794 or 8196.
- Boys Huffly 24" mountain bike. \$65. Call Barry x2230.
- Kayak: 15 foot, one-man, kevlar, river kayak, \$140, call Mike at 630-208-1751 or e-mail roman@fnal.gov.
- Dismantling office and machine shop. Heavy duty metal shelving, shop benches, rolling work tables, fire extinguishers, wood crates, desks, chairs, typewriters, too much to list. Items \$5 and up. Call Vic 630-513-1000.
- Engagement and wedding ring set. Engagement ring has 1/2k. round diamond, and wedding band has 7 stones totaling 1k. Asking \$1,200 obo. Call 630-499-5061; if no answer, leave message.

BETA FANS

- Beta video collection, too many to list but ranging from Casablanca to Butch Cassidy, Shane to Star Trek, Hitchcock to King Kong. \$25 takes the lot, and I'll throw in an old Sanyo Beta VCR if you want to try rehabbing it. E-mail: mikep@fnal.gov.

AUDIO TAPES

- Used but in good condition. 7" reel tapes, \$4 each. 8-track tapes, \$5 each. Call Ed Dijk x6300, 630-665-6674, or dijak@fnal.gov.

FOR RENT

- Single family home, 3 bedroom, 1 bath, 2.5 car garage, fenced backyard, \$1200 per month, Available 10-1. Location Aurora, South of Montgomery Rd, East of Eola Rd. west of White Eagle. Call Ed Dijk x6300, 630-665-6674, or dijak@fnal.gov

WANTED

- Tree seeds: Bur Oak, Red Oak, White Oak, Shagbark Hickory, Bitternut Hickory; for Fermilab's Roads and Grounds Department. The seeds should be separated by species, dried and kept cool. People can drop the seeds off at Roads & Grounds or call Bob Lootens at x3303 for pickup.
- Winter indoor storage space for a 21' boat. Call Lou at 840-3343
- Roto tiller, must be working. x 6633.

BIBLE STUDY

- We are going on a year-long study of the entire Bible, each Wednesday at Noon in the Huddle. Study materials provided. Contact Jeff Ruffin x4432, or ruffin@fnal.gov.

BOWLERS WANTED

- The Fermi Wednesday bowling league needs a couple of bowlers. We are two bowlers short for a 12-team league at Bowling Green in West Chicago. Call Dale Miller at x3875.

FRENCH FOR KIDS

- Parlez-vous francais? Join a group of parents with young children for playgroup + conversation in French. Contact Anne at 879-0995 or aheavey@fnal.gov.

ROBERT R. WILSON FELLOWS PROGRAM

The Wilson Fellowship program at Fermilab supports particle physicists in the early stage of their careers by providing unique opportunities for self-directed research-focused positions in the field of experimental particle physics. The fellowships are awarded on a competitive basis to Ph.D. physicists of exceptional talent as evidenced by their contributions to the field in their postdoctoral work. Fellows will work at Fermilab in an area of experimental particle physics of their choice. Wilson Fellowships are tenure track positions with an initial term appointment of three years. Candidates should submit a research statement describing their proposed program and a curriculum vitae; and

should arrange to have four letters of reference sent to the address given below. Applications and letters of reference should be received by November 30, 2000.

Applications, letters and requests for information should be sent to:

Patricia L. McBride,
Chairman, Wilson Fellows Committee
Fermi National Accelerator Laboratory, MS234
P.O. Box 500
Batavia, IL 60510-0500
e-mail: mcbride@fnal.gov

Fermilab is an equal opportunity/Affirmative Action Employer.

http://www.fnal.gov/directorate/public_affairs/ferminews/



F E R M I L A B
A U S . D E P A R T M E N T O F E N E R G Y L A B O R A T O R Y

Office of Public Affairs
P.O. Box 500, Batavia, IL 60510

First-Class Mail
U.S. Postage
PAID
Bartlett, IL
Permit No. 125