CLASSIFIEDS

FOR SALE

■ ’95 Ford Escort 4dr sedan LX. auto, a/c, dual airbag, am/fm cassette, 39K miles, well maintained, $6,400. shoji@fnal.gov or x3666.

■ ’89 Dodge Colt, 2dr, 5 spd, ac, am/fm/cass, 92K miles. Reliable car, runs very good, $2,500 obo. Contact Ana, anapaula@fnal.gov or Roberto, x3438 or PaulaBeto@aol.com.

■ ’88 Dodge Caravan SE, V6 3.0L, 135K, newer engine, was reliable family car. $2,500 obo. dane@fnal.gov or x4730.

■ ’88 Toyota Corolla, automatic, 98K miles, new radiator, 2nd owner w/all records, $3,000 obo. Monique, srivasta@fnal.gov srivasta@fnal.gov.

■ ’88 Ford Escort GL 2 Dr Hbk, auto, 87K miles. Good condition. $1,300 obo. Call x3600 or agatam@fnal.gov.

■ ’87 Ford E-150 conversion Van by Kellogg, multi brown tone, 5.8 L/351 cu. in., v8, 93K miles, ac, at, ps, pb, pw, pd, clr TV, 40 ch. CB, Lumbar pwr seats, am/fm cass., $2,200. Call Perry (630) 897-3527 after 3:30 p.m.

■ ’87 Cutlass Supreme, 4 dr, original owner, new: tires, starter, brakes & many more, runs great, 113K miles, $2,600 obo. Call (847) 965-2190.

■ ’86 Mercury Lynx station-wagon, blue, some rust, but all panels match, good interior & extremely reliable, 80K miles on rebuilt engine, all maint. records, 2nd owner, 4 spd., $850. John, (815) 886-0036.

■ ’86 VW Golf GTI 3-dr htchbk, black, 5-sp, 133K highway miles, a/c, CD am/fm, sunroof, tint windows, looks & runs great, no rust, maint. records for last 6 years, $2,200 obo. Dima x2409 or vavilov@fnal.gov.

■ Medium blue sleeper couch & loveseat, contemporary design, $350 obo. Call Jackie, x3027.

■ Antiques-beautiful, quality pieces: oil lamps (prices vary); Set-4 oak Bentwood chairs, $225; mahogany rushed chair, $160; oval drop leaf table, $175; oak stool w/moving parts, $150; beveled mirror, $75; Pine 1/2 table, $40; small pine stool, $45; shelf, $65; sickle, $40; Honduran mahogany spindle table (needs restoration, new Honduran mahogany incl. for restoration), $75; 1987 ed. June Precious Moments, $50. Call (630) 717-5181 if seriously interested.

■ Futon, full size, black & white striped cover, w/oak couch, $175. Call Patrick, (630) 717-0661, x8596, or gartung@fnal.gov.

■ Desk, complete office work center. Must see this great value. Asking only $200, sells for much more. Call for details (630) 717-5181.

■ Computer, Compaq DeskPro 2000, 5133/2500/CD, Intel Pentium 133 MHz, hard drive 2.5 GB EIDE, 16 MB, 256 KB cache, Cirrus 5435 graphics, 8xCD ROM, Mini tower 5 slot/5 Bays. New (factory sealed box) asking $600, Please call (630) 202-6881.

■ 68 Automag Paintball Gun Level 7 w/riffled 18″ barrel & expansion chamber, includes 12 oz. tank, rail sight, & hopper, $500. obo. Contact markivie@fnal.gov with any questions.

■ 3 drawer dresser w/book case that fits on top. Also matching corner desk, light mahogany, $125. Sandy x4171.

■ Boat, ‘93 - 18’ Mirro Craft w/mariner 75 eng., magic eye trolling motor, electric anchor, deep well, fish finder, trailer, life jackets, rod holders. Asking $7,000 (2k under book price). Call Tom McKinsey (630) 906-9653.

■ House, Warrenville, near Batavia Rd gate, bike to work, 7 rm, 3 br, air, fr w/frplc, patio, great yard, nice, privacy. $137,900. (630) 393-7770.

■ House, 2-3 bedroom ranch, St. Charles. Low maintenance inside & out. $ 140,000. Close to schools, library & down town. Call (630) 584-6698.

■ Home, Genoa, Illinois, cute, clean, almost 1/2 acre, country ranch. Priced to sell, $107,900. Low taxes, garage. (847) 683-3476.

■ 10 acres of country living, great for horses, 3 bd, 2 bath 2 1/2 garage, living rm w/ fireplace & vaulted ceiling, oak throughout, gazebos, 76′ deck, asphalt drive, fruit trees, storage bldgs, plus income. Lake Holiday vicinity, $239,900. (815) 498-9402.

■ House, W. Aurora, near Aurora University, 2 br ranch, a/c, neutral decor, large living room, oak cabinets in kitchen, finished basement w/ possible 3rd br, 2 baths, large deck w/patio, privacy fence around nice sized yard. Asking $118,500. Call (630) 897-9596

■ 5 Acre Lots, 1 mile west of Rt. 47 on Main Street, Batavia. All lots have road frontage on Main. Price $85,000 each. Call Don Byrd, x8217 or (630) 557-2397.

WANTED

■ Mac Plus software, mouse, external hard drive, modem, and memory. Please e-mail markivie@fnal.gov with info and price.

■ For some special pedagogical reasons I need an old copy of Resnik & Halliday, Physics Text. Preferably Vol. I/II, ca. 1963. Prepared to beg, borrow, steal, or possibly buy such a book, regardless of condition, assuming all the pages are somewhat intact. Call Jim, (630) 584-2801.

■ Pre-owned Medela Pump-in-Style in good working condition. Contact Heidi (630) 960-5326 or Pennie x2363, phall@fnal.gov.

■ Particle physicist to help decipher instructions, for MBA student attempting to build a Hieronymous machine (detects the 92 primary elements). Can you help? Call Grace (630) 852-5411.

■ Any airplane or aviation related paraphernalia, memorabilia, etc. Parts models, books, anything, good money paid for any useable items. Contact Vic, (630) 513-1000.

FREE

■ Kenmore sewing machine w/cabinet. Full size mattress, spring, frame, & blue metal headboard. Full size couch, brown. Amana microwave w/stand. Oversize oak desk w/3 drawers (circa 1950’s). Two-drawer metal file cabinet. Please call Connie, (630) 852-3033.

■ 40 pink concrete patio blocks 8″ x 16″ x 1″, 80 red patio bricks 4″ x 8″ x 2″ and some treated deck lumber, mostly 2″ x 6″, some 4″ x 4″ various lengths. Call Lee, x8236 or (630) 761-8346 or lueking@fnal.gov.

SI NON VIS IMPRIMI NOLI PATI FIERI
FERMINEWS MCMLXXVII

FermiNews
Fermi National Accelerator Laboratory

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

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

The deadline for the Friday, October 2, 1998, issue of *FermiNews* is Tuesday, September 22.

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

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

☆ U.S. GOVERNMENT PRINTING OFFICE:
1998--646-054/81012

50%
TOTAL RECOVERED FIBER
10% POST-CONSUMER FIBER

FermiNews

Fermi National Accelerator Laboratory

Volume 21 | Friday, September 18, 1998 | Number 18

The critical path for the **Main Injector** project shifts to the **Recycler,** where technicians will soon install the last magnets and put the **beam tube** in place.

Photo by Reidar Hahn

INSIDE

Main Injector Gets a Booster Shot

Back from its shutdown, Booster gets beam and brings Main Injector commissioning closer.

by Mike Perricone, Office of Public Affairs

Tired eyes watched the monitor screens late at night, looking for evidence of the long-awaited event. What they saw was a bull's-eye.

The time: 11:00 p.m. (2300 hrs.) Central Daylight Time. The date: Tuesday, Sept. 1, 1998. The place: Fermilab's Main Control room.

The event: A beam of protons ($4x10^{11}$ of them) circulated in Fermilab's Booster accelerator for 40 milliseconds (40 thousandths of a second)—traveling 20,000 times around the 475-meter ring in about one-tenth of the time it takes a 90-mph fastball traveling 60 feet, six inches to reach home plate.

continued on page 2

Photo by Reidar Hahn

With beam coming to the Main Injector, so are locks and keys. As of Sept. 8, the Main Injector enclosure no longer offered open access. The interlock system (pictured here) is the critical safety feature when the accelerator is running.

Main Injector

continued from page 1

"September 1 was our target date, and we met our goal," said Beams Division head Steve Holmes, project director for the Main Injector. "To get beam to the Main Injector, it has to come out of the Booster."

Now the beam is on its way.

"That's one small step for Booster, and one large step toward Run II," said Bob Webber, head of Beams Division's Proton Source Department.

These were the first protons to move through the Booster since its April 1 shut-down for the complex process of slipping 1,450 tons of radiation-shielding steel between the tunnel and the building above it—accomplished in 135 accident-free days by the civil contractor, Whittaker Construction Company.

Bringing beam to the Booster means the Main Injector is on target for commissioning later this month.

The Main Injector is the main event in preparations for Run II of the Tevatron, where more proton-antiproton collisions than ever before will boost hopes of new discoveries on the frontier of high-energy physics.

But increasing the proton flow for Run II begins with the Booster. The 30-year-old workhorse accelerator will be expected to step up its own production by 20-25 percent to about 5×10^{12} protons per pulse, or more than 10 times the intensity of the test beam that ran on Sept. 1.

CRITICAL PATH

"This was a very successful first step, and it means we didn't do anything so bad to the Booster that it would never run again," Webber said with a laugh. He added that lapsed time of the run wasn't critical in judging its effectiveness.

"That time limit was not unexpected, but it was not terribly important," Webber explained. "Our goal was simply to show we could circulate beam for many turns. Each turn at this energy takes 2.2 microseconds (millionths of a second). So 30 to 40 milliseconds was a great success."

The Booster's 30-year-old power supply also was replaced during the shutdown. By Sept. 1, only three of the four main power supplies were ready for operation; further, a problem with the Low Conductivity Water (LCW) cooling system left only two power supplies operational. The Booster could circulate the beam it received from Linac (the Linear Accelerator) but could not use its RF (radiofrequency) cavities to accelerate the beam beyond Linac's 400 MeV (million electron volt) level. As successful a run as it was, acceleration was still the missing element.

But by 11 p.m. on Thursday, Sept. 3, with the LCW problems resolved, the RF cavities operating, and three power sources available, Webber along with Jim Lackey and Ray Tomlin had a beam of 2×10^{11} particles accelerated up to the Booster's full 8 GeV (billion electron volts). It marked the culmination of close teamwork by members of the Beams Division's Proton Source, Electrical Engineering Support, Mechanical Support, Radio Frequency/Instrumentation, and Operations Departments.

"The performance was great to see," Webber said, "but we have a lot of work to do to bring it up to the required parameters for Run II."

While Webber and his colleagues in the Proton Source and Operations Depts. work on the Booster's fine-tuning, the critical path for the Main Injector project shifts to the installation and welding of the Recycler beam tube.

Elliptical in cross-section, the beam tube is fabricated in straight segments which are then wrapped with insulation, heat-conducting tape and aluminum foil. The final step before installation is bending the tube according to a precisely-measured quantity called the "sagitta," which in effect defines how much room the beam has to wander away from the center line of the magnet (see the accompanying diagrams). The sagitta process has lots of history in fabricating other accelerator beam tubes at Fermilab.

The Recycler sits above the Main Injector, with the mission of literally saving and recycling particles that would have been lost from previous collision experiments in the Tevatron. The Recycler is a two-for-one bargain: the Main Injector was kept so scrupulously under budget that this second ring, the first of its type anywhere, was built from the contingency funds.

"It's a little hectic right now," Holmes said, "but one of the reasons is that we're trying to do two accelerators at once. It's really a measure of how well things have gone, being able to build a second ring within the confines of the original budget."

The target date for having the Main Injector fully operational is March 1999. Commissioning starts another long process of small steps. Initially, the beam will run at low energy, without being accelerated above 8 GeV. With any accelerator, whether the Booster, the Recycler or the Main Injector, filling a beam tube with sub-atomic particles is not as simple as filling a pipe with water.

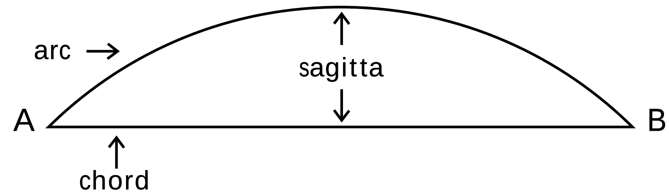
If you open a spray of water and direct it down a pipe, the water molecules will bounce off the sides of pipe and fill the tube. Not so with a particle beam, which must be kept precisely in the center of the beam pipe and kept away from any obstruction—including and especially the wall of the beam tube, which would act like absorptive material.

"Imagine you're spraying water down a pipe where the walls are made of a perfect sponge," Holmes said. "If you're not spraying water exactly down the middle, it's not going very far. When a particle in the beam hits the wall, it's gone. We can't afford to have it hit anything."

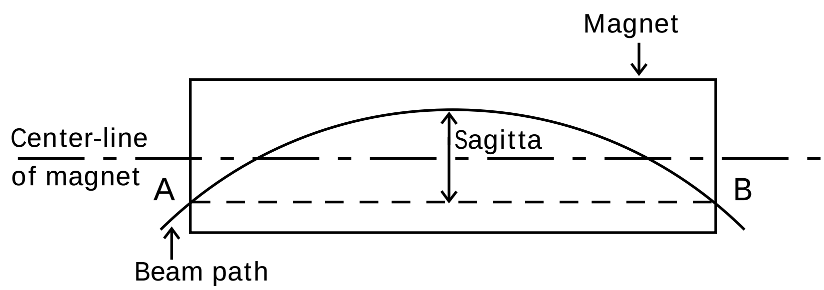
So the small steps will continue, making progress without much celebration, even after hitting a bull's-eye.

"When we got beam in the Booster, there was no champagne afterward," Webber said. "Just a sleepy drive home." ■

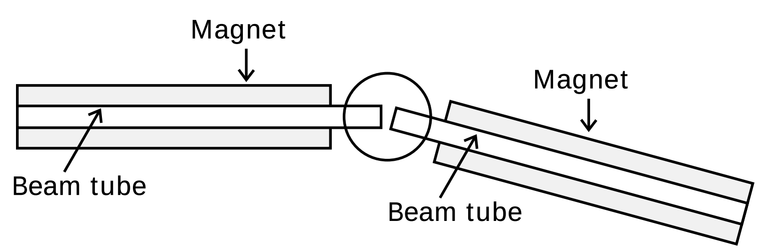
Sagitta: Critical to two areas of beam path design



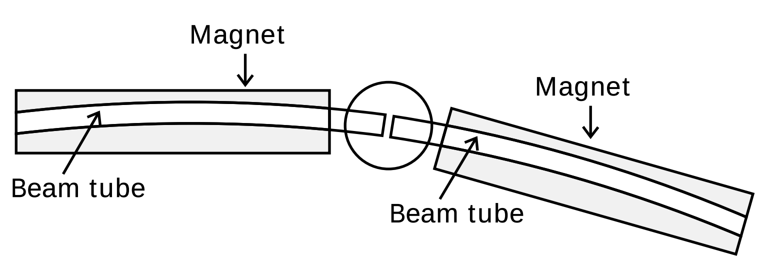
"Sagitta" is defined as the distance between the mid-point of an arc and the mid-point of its chord.



The particle beam takes a curved path through the straight Recycler magnet, bending around the magnet's center line, which bisects the sagitta.



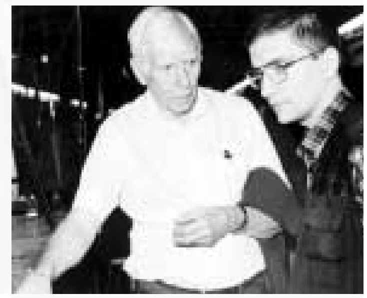
Beam tube sections designed without proper sagitta leave a notch when they meet.



Beam tube sections designed with proper sagitta are flush when they meet, simplifying the weld.

Photos by Jenny Mullins

Tevatron tour leader Helen Edwards won a Presidential Medal of Honor for her part in building the Tevatron.



Fermilab physicist Alvin Tollestrup, another Medal of Honor winner, explains the workings of the collider he helped build to a student who will one day study the particle collisions it creates.

Talk of the Tunnel

Follow the Beam

By Judy Jackson, Office of Public Affairs

What do high-energy physicists want? Three things: beam, beam and more beam. Keep those protons coming! Because beam means particle collisions, and collisions mean data, and data are where discoveries lurk, the prize of those who get there first—with the most beam.

Fermilab experimenters—"users," we call them, an apt term for these proton junkies—tend not to care where the protons come from, so long as beam keeps streaming into their detectors. This summer, though, in an effort to instill in the upcoming generation of users a decent respect for the art of acceleration, Fermilab accelerator gurus brought a group of budding physicists upstream to consider the source.

Fermilab in summer is full of students: grad students, college kids, Americans, foreigners. (Are there any physics students left in Italy in August, or does it just seem as if they are all in Illinois?) For two weeks, 40 or so of these students attended a kind of particle-accelerator day camp, under the guidance of Head Counselor Bill Foster. Foster, a Fermilab physicist, wanted these users-to-be to get a good look at the guts of a particle physics lab, to gain an appreciation for what goes into making a high-energy, high-luminosity particle beam — thin as a hair and crammed with the fastest-moving protons on earth.

Each day after a one-hour lecture on accelerator basics, the students took a field trip. The young folks saw the Cockcroft-Walton, the Booster, the Linac and the Antiproton Source — the accelerators that feed the Tevatron. They visited the plant that makes liquid helium to keep superconducting magnets close to absolute zero. They watched the art of coil winding in the magnet factory and saw demos of accelerator electronics.

For Camp Accelerator's final session, Foster had an inspiration: Take the students into the Tevatron, the acme of Fermilab accelerators, for a tour *led by the physicists who built it!* As guides, Foster signed up Helen Edwards and Alvin Tollestrup, who won Presidential Medals of Honor for their part in the job; Peter Limon, self-described "young punk at the time;" engineer Larry Sauer; and accelerator theorist Don Edwards, husband of Helen. In charge was Operations Specialist Todd Johnson.

Foster's finale attracted a sell-out crowd. First, we all read the safety rules, signed the roster, and pinned on the radiation badges that are *de rigueur* when entering The Tunnel. Then, just like Color Day at camp, Foster assigned everyone to a team: A, B, C, and D. Team B followed Edwards into the Tevatron tunnel. Down we went, hustling to keep up with Edwards, who pointed out the dipoles, the quadrupoles, the spool pieces, the feed cans, the quench protectors, the Lambertsons and a few appurtenances that mystified her. "I have no idea what that is," the Presidential Medalist told Team B, most of whom hailed from Padua and Pisa.

Then, from Team B, in response to a bulletin from the rear: "What? WE'RE GOING ALL THE WAY AROUND?"

Foster, it turned out, had planned no mere peek-and-run tunnel outing. We were walking all the way around, he told us, all four miles, all of us.

"It's kind of an initiation thing for the kids," he said.

We all walked all the way around. After two or three miles, one quadrupole began to look much like another. We practiced our English and Italian.

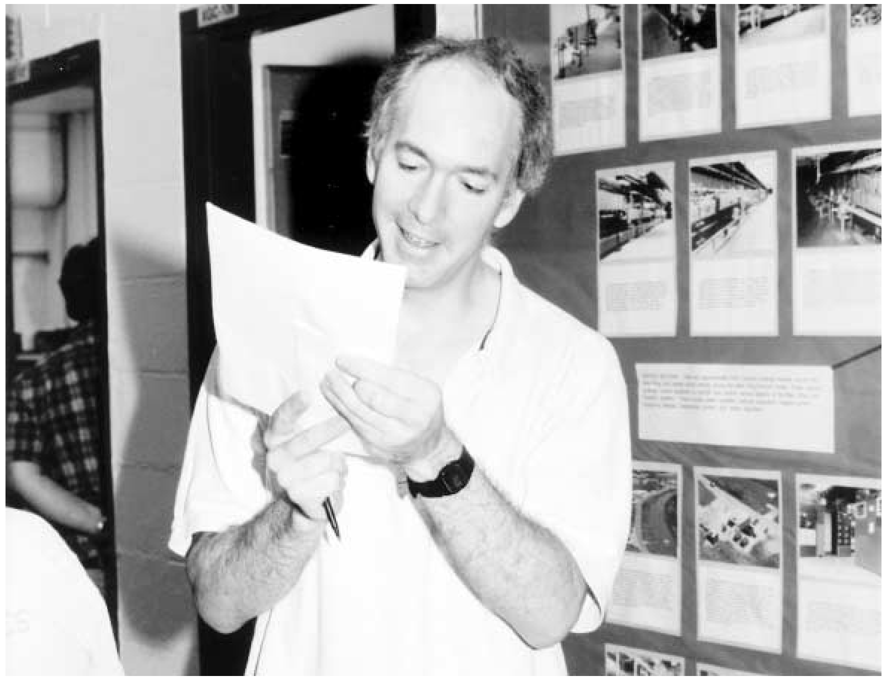


Photo by Jenny Mullins

Physicist Bill Foster checks the roster for Camp Accelerator's final field trip. The Graduate Student Association worked with Foster to organize this summer's Academic Lecture Series on accelerators at Fermilab.

"Come si dice 'magnet' in Italiano?

"Magnete."

"Oh."

The detours for the two collider detectors, CDF and DZero, made a nice diversion. We marveled at the intricacies of FZero, where the new Main Injector will soon hook up to the Tevatron. Eventually, footsore but triumphant, we reached our starting point and Foster let us out.

Afterward, the Tevatron tour guides discussed the youthfulness of those who would be using the Tevatron in a year or two.

Limon: "They're so young! They're just babies."

Don Edwards: "Can you imagine how old we look to them?" ■

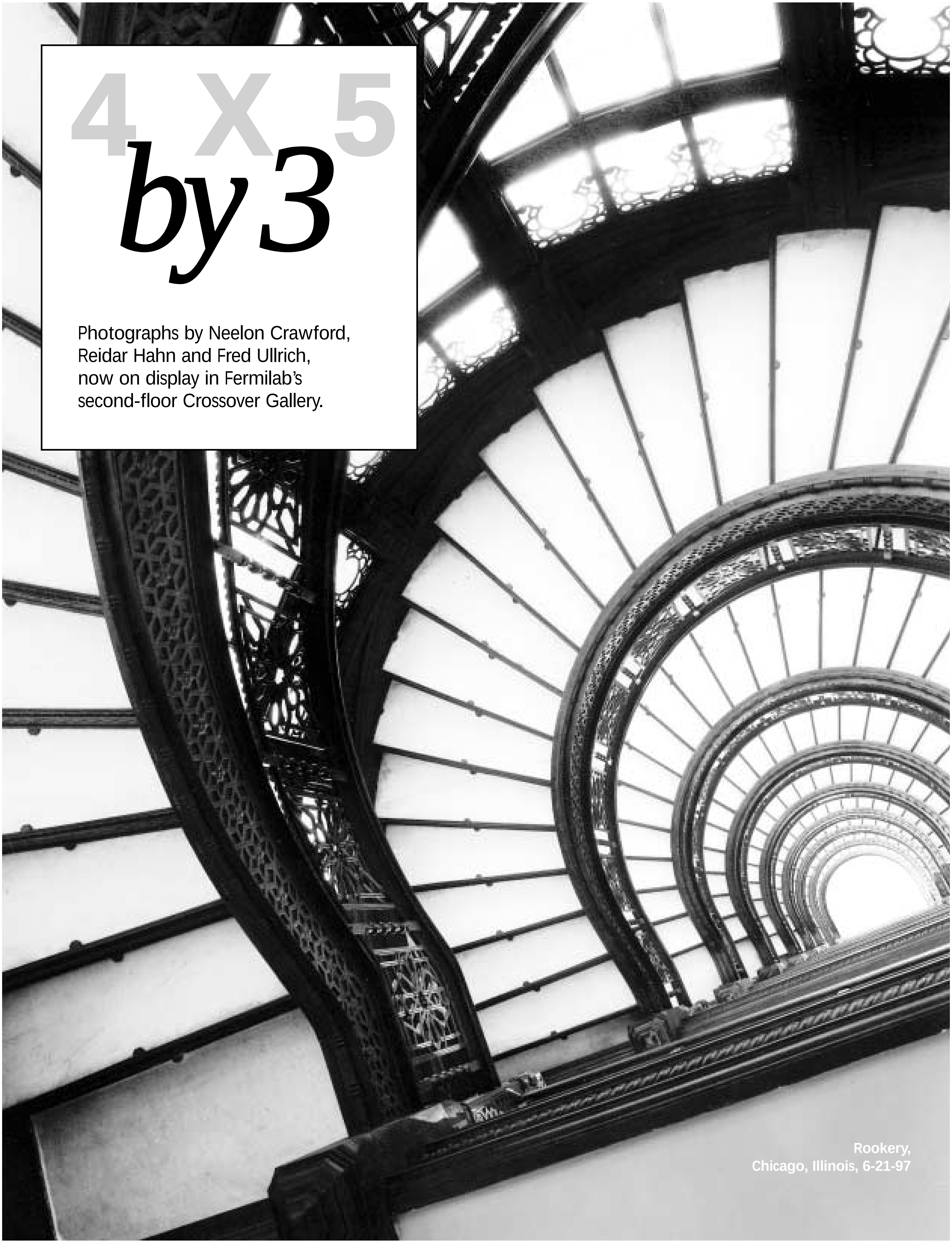
Art Sees the Darnedest Things

Television personality Art Linkletter (center), gets a look at the innards of a superconducting Tevatron magnet, explained by Fermilab Associate Director Bruce Chrisman (right). Linkletter, now 86, visited Fermilab on Sunday, August 30, for lunch and a tour, accompanied by colleagues who share his interest in solar and renewable energy.

Photo by Jenny Mullins

4 X 5 *by 3*

Photographs by Neelon Crawford,
Reidar Hahn and Fred Ullrich,
now on display in Fermilab's
second-floor Crossover Gallery.



Rookery,
Chicago, Illinois, 6-21-97

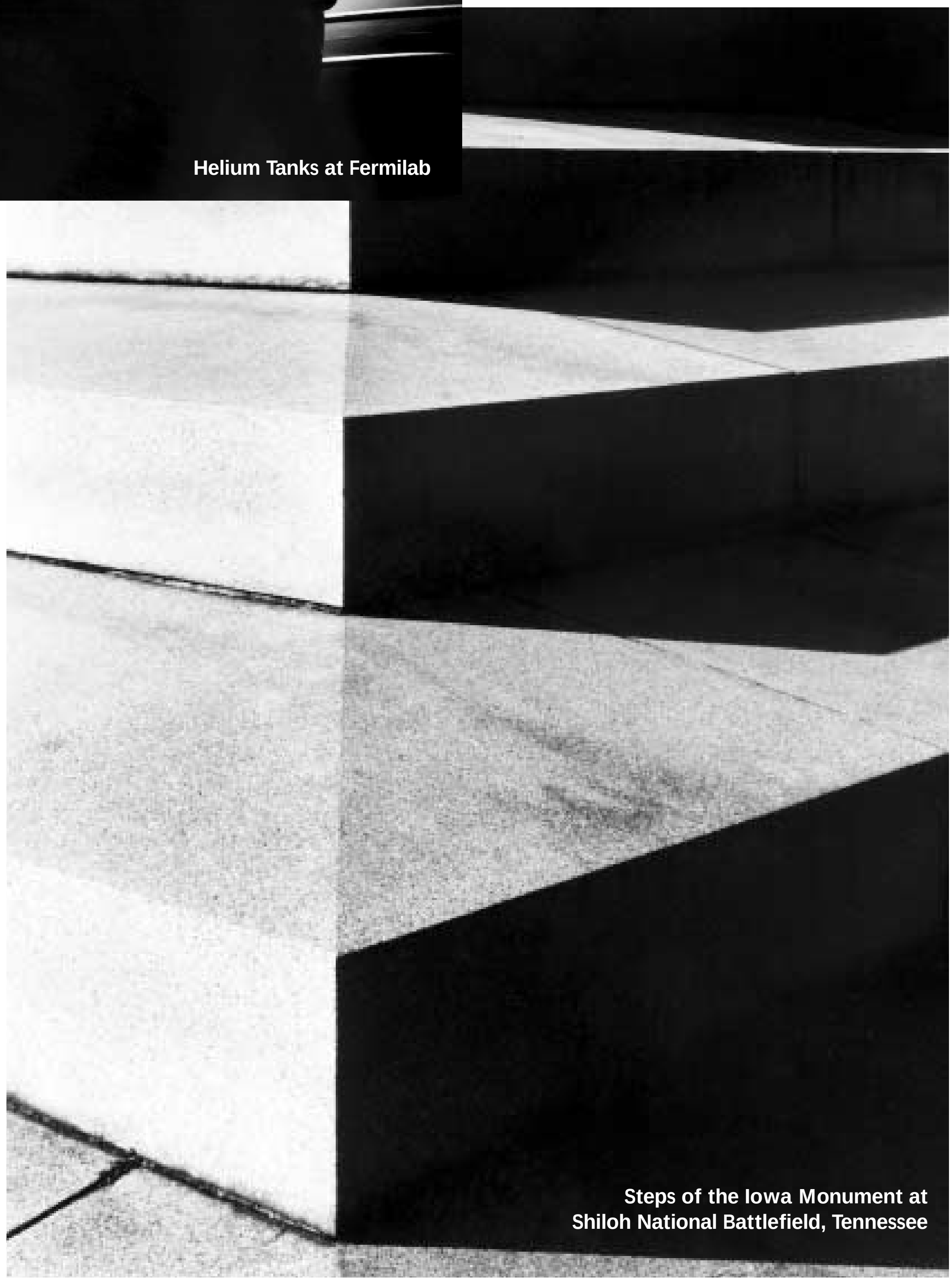
Helium Tanks at Fermilab

“ The remarkable scientific research equipment, produced by many highly specialized people at great cost, is itself fantastic and beautiful. Designed for extending human vision outward and inward beyond all known scientific understanding, these tools are icons of our era as pyramids were for the ancients.”

◄ **Neelon Crawford,**
freelance photographer

“ As most of my time is spent behind the camera as a commercial photographer, I really enjoy the time I spend doing art photography, when I’m the client, and the audience. Some artists create their art for others…. I do my art photography for myself.”

Reidar Hahn, ►
Fermilab photographer



Steps of the Iowa Monument at
Shiloh National Battlefield, Tennessee

“ The age and the scale of the subject is always an interesting study….”

◄ **Fred Ullrich,**
Fermilab photographer

A High-Energy Team:
The University of Rochester and Fermilab

Photo courtesy of the University of Rochester

With a faculty of only 26, the physics department at the University of Rochester ranks among the nation's best.

by John Scifers, Office of Public Affairs

"Our motto is 'Meliora,' a Latin word carrying the connotation 'Always Better,'" says University of Rochester spokesman Robert Kraus. "We generally take it, and use it, as an exhortation to continually improve in everything we do."

Rochester physicists must have "Meliora" hard-wired into their computer terminals, because continually improving has been their way of doing business with Fermilab for the past 30 years.

Rochester's past spawns present distinction

Founded in 1850 as a Baptist-sponsored institution, Rochester awarded its first physics Ph.D. in 1935. Under the guidance of physicists Lee DuBridge and Sydney Barnes, the university quickly established itself as one of the nation's leaders in the emerging field of high-energy physics. In the 1940s, DuBridge and Barnes built one of the world's first, and at the time most powerful, synchro-cyclotrons, a direct predecessor of modern particle accelerators. Some of its components, and most of Rochester's high-energy physicists, have since been incorporated into Fermilab's research program.

In the early 1950s, Robert Marshak—then chair of Rochester's physics department—expanded the university's involvement in the high-energy physics community by organizing the International Conference on High-Energy Physics. Still informally called "Rochester Conferences," ICHEP pioneered the internationalization of high-energy physics collaboration by gathering physicists from all over the globe—even from Russia at the height of the Cold War—for a free exchange of ideas. Initially held in Rochester's physics building, the conference later rotated to sites around the world, and continues to play an important role in bringing high-energy physicists together.

According to Paul Slattery, until recently chair of the physics department and presently Dean of Research and Graduate Studies at Rochester, the university is recognized as having one of the best physics programs in the United

States. It was recently ranked 25th nationally by the National Research Council, an impressive achievement for a department with a faculty of only 26. "Most of the departments in our peer group from a quality perspective are about twice our size," says Slattery. The university's ranking for high-energy physics is higher still. Notes Slattery, it was "high-energy physics, both theoretical and experimental, that put Rochester on the map in physics." Arguably, the university's present distinction in high-energy physics arises in large part from its heavy involvement in Fermilab, beginning with the group's participation in the Lab's initial experiments.

Rochester's present: making strides at Fermilab

Rochester's strong connection to Fermilab over the years helps explain why the university's close-to-fifty users rank as the Lab's third largest user group—trailing only Argonne National Laboratory and the University of Michigan. With undergraduate students, graduate students, postdocs, research faculty and professors, this large group distributes its talent across almost every major Fermilab experimental program.

Professors teach full-time back in New York, communicating with and guiding their research teams at the Lab through teleconferencing and e-mail. Typically, every week or two, they fly to the Lab for a few days of discussions and hands-on involvement in their experiments. It's a grueling schedule—even if direct flights make it work—but the breadth and depth of the scientists' involvement in both the experiments and academic life make it a necessity.

Participation in CDF

Arie Bodek, Paul Tipton and Kevin McFarland lead Rochester's activities in the CDF collaboration, currently focusing on upgrades to the CDF detector for Run II. Tipton is quick to point out that, unlike others who have been working at Fermilab since its beginning, he "was in the seventh grade" when the Lab first began operations. But he isn't new to Fermilab; he was a Wilson Fellow before joining the Rochester faculty in 1991. Like other Rochester faculty, he also teaches—everything from a pre-med physics class with over 200 students to a "Physics for Poets" course. At Fermilab, Tipton guides a group of two postdocs and four graduate students, plus undergraduates during the summer, in improving mechanical aspects of the SVXII vertex detector.

Bodek and his research team are upgrading the CDF end-plug calorimeter, technology that will also be used in the CMS detector for CERN's Large Hadron Collider. At Rochester, Bodek presently chairs the physics department, but finds time to come to the Lab every two weeks. Previously involved with experiments elsewhere in the United States, he has found a home for his work at Fermilab.

The department's newest addition is McFarland, a former Lederman Fellow who joined the Rochester faculty less than three months ago. McFarland and his postdocs and graduate students are designing a computer system prototype for CDF's Level-3 trigger system. The prototype will lead to a network of 250 to 300 personal computers that distribute and process the oceans of data the detector will collect during Run II.

Participation in DZero

It may seem strange for scientists from the same university to be working on competing experiments, but Rochester scientists are equally active on DZero. Tom Ferbel and the late Fred Lobkowicz began this effort, which is presently directed by Ferbel and Slattery, together with research faculty George Ginther and Marek Zielinski. The group is contributing to the DZero upgrade in several areas, including helping build VLPC cassette hardware for the scintillating fiber tracker, providing Monte Carlo software for the DZero calorimeter, and helping develop the experiment's Run II online system.

Tom Ferbel—who brews his own blend of Starbuck's coffee for an occasional cappuccino —

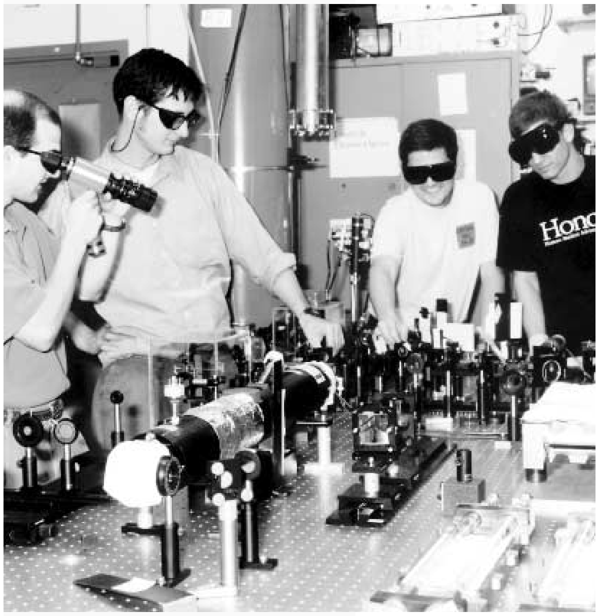
Photo by Reidar Hahn

Left to right: Physicists George Ginther, Paul Slattery and Marek Zielinski pose by the calorimeter used to detect photons in experiment E706.

Arie Bodek, chair of Rochester's physics department, is involved in upgrading CDF's end-plug calorimeter.

Photo by James Montanus, University of Rochester

Rochester physicist Paul Tipton was one of the CDF collaborators who discovered the top quark.



Left to right: Not the Blues Brothers but Rochester students Michael Fitch, Brian Taylor, Bill Butler, and Jorge Viamontes adjust the laser of the AZero photoinjector.

has other high-energy physics interests as well. With the help of Fermilab, the Department of Energy, and NATO, he founded "the most popular educational program in high-energy physics"—a summer school for advanced graduate students and postdocs in St. Croix.

Fixed-target experimentation

Although their present focus is on the Tevatron collider experiments, CDF and DZero, the Rochester group has had an active history of fixed-target experimentation as well. Bodek has had a longstanding association with Fermilab neutrino experiments, providing the R in the CCFR collaboration (Chicago, Columbia, Fermilab & Rochester). His latest effort in this area is NuTeV (Neutrinos at the Tevatron), whose data on the W-boson mass complement the work of CDF and DZero. In addition to Bodek and research faculty member Willis Sakumoto, McFarland also worked on NuTeV, before joining the Rochester group.

Ferbel and Slattery have been involved in fixed-target experiments dating back to the early days of Fermilab. Their latest effort is E706, which provided the world's most precise measurements on the production of what are known as "direct'' photons, those that do not originate from the decays of other elementary particles. This experiment has led to new insights into the application of quantum chromodynamics (the theory that describes the interactions of quarks and gluons) to the physical processes that occur at Fermilab energies.

Photos by Jenny Mullins

Graduate student Ben Kilminster, postdoc Kirsten Tollefson and the university's newest faculty member Kevin McFarland are designing a prototype for CDF's level-3 trigger.

Antihydrogen in flight

For years, antimatter has reserved a special place in the hearts of science-fiction writers; Rochester physicists are interested in looking at the scientific side of this subject. Adrian Melissinos leads a group of Rochester students who are building a laser for antihydrogen spectroscopy to test whether, as theory holds, atoms and antiatoms behave alike. According to Melissinos, "After you make the antiproton, there is a second level of complexity—you can make antiatoms." His group and others are studying antihydrogen because, with only a small number of antiparticles available in Fermilab collisions, it is the simplest antiatom to make. Still, antiatoms are rare—over several months, only 66 antihydrogen events have been detected. Consequently, Melissinos' group will be working diligently to collect all the data they can.

Participation in CMS

Looking to the future, the Rochester group has decided to focus on a single experiment at CERN's Large Hadron Collider, selecting CMS because of its close relationship to Fermilab. At present Bodek and Slattery lead this activity, together with research faculty Pawel deBarbaro, Howard Budd and Ginther. Over time Tipton and McFarland also expect to join. The group is responsible for supplying all of the optical elements for the CMS barrel hadronic calorimeter, a multi-year manufacturing effort that will take place in the Fermilab Village, and for providing the motion table used to calibrate and test the CMS detector elements (see *FermiNews* 8/14/98).

Rochester's future at Fermilab

With such a strong, longstanding, and continuing connection between the University of Rochester and Fermilab, little doubt remains that this team will continue in the race toward the high-physics discoveries of the new millennium. But much depends on support from Washington, D.C., where signs this fiscal year are hopeful.

Congresswoman Louise M. Slaughter (D-NY), whose 28th Congressional District includes the University of Rochester, supports continued and increased funding for physics research. "I am a strong supporter of the University of Rochester's efforts to conduct cutting-edge research," she said, "and have assisted in several endeavors ... [to] create jobs, provide capital and increase the prestige of the university."

Representative Slaughter recently proved this stance by cosponsoring the National Research Investment Act of 1998, which would double the funding for basic scientific research over a 10-year period. Funding would reach a maximum of $68 billion in fiscal year 2008.

With support from Washington, and in partnership with Fermilab, the University of Rochester is poised to remain one of the world's most prestigious high-energy physics institutes. Rochester physicists and students will no doubt continue to improve in everything they do. Meliora! ■

Chez Léon

MENU

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

For reservations, call x4512
Cakes for Special Occasions
Dietary Restrictions
Contact Tita, x3524
http://www.fnal.gov/faw/events/menus.html

Lunch Wednesday September 23

Pasta Salad with Shrimp
Roasted Red Peppers
and Black Olives
Caesar Salad
Chocolate Cake
with Espresso Ganache

Dinner Thursday September 24

Antipasto
Swordfish with Neapolitan Sauce
Spiced Red Risotto
Spinach with Garlic and
LemonOrange Cake

Lunch Wednesday September 30

Grilled Flank Steak
with Cumin and Cilantro
Poblano Mashed Potatoes
Smokey Bean Salad
Banana Bouchees

Dinner Thursday October 1

Spinach Salad with
Seared Shrimp,
Bacon and Peppers
Roasted Fillet of Beef with
Beer and Horseradish Sauce
Red Radishes Sauteed
with Vinegar
Gratin of Potatoes
Onions and Fresh Herbs
Chocolate Almond Cake

LAB NOTES

Books, Tapes and Videos Available for Check-Out

Need answers regarding a health problem? (cancers, menopause, stress, back pain, etc.) Missed a Brown Bag Seminar? (estate planning, bankruptcy, prostate) Starting a workout or swim program? (weight training, swimming for fitness, fit or fat) The answer to these questions may be found in the Wellness Library located in the Recreation Office, WH15W.

Library list is available on the Recreation Web Page http://fnalpubs.fnal.gov/benedept/recreation/recreation.html

CORRECTION

The story on pixel detectors in the September 18, 1998, issue of *FermiNews* inadvertently contained several errors. A readout chip, prior to bonding to a sensor chip, is pictured at the bottom of p. 4. It measures 4 millimeters by 6 millimeters. In the other caption on the same page: Only one of the detectors developed for CERN's LHC, the CMS detector, uses square pixels.

They are 150 microns on a side. On p. 5, the photo in the upper right corner is of indium bumps on detectors with 30 micron by 200 micron pixels. Finally, the prototypes described in the article were bonded by Advanced Interconnect Technology, whose production facilities are in Hong Kong and Singapore, and by Boeing North America, Inc.

MILESTONES

MARRIED

Marcia Knauf (CD / DCD) and Kevin Teckenbrock on September 5.

RETIRING

David Morrison, I.D. # 8930 on September 25, from LS / Medical.

DIED

Bill Noe, Sr. on August 21, 1998 at Sherman Hospital.

HONORED

FermiNews essay contest winners Joe Lykken (center), a Fermilab theorist, and Glen Crawford (right), a SLAC experimentalist. Congressman Vern Ehlers (R-MI) presented a flag to Lykken. Crawford won a bottle of champagne.

CALENDAR

SEPTEMBER 18

Fermilab International Film Society presents: *Fast, Cheap and Out of Control* Dir: Errol Morris, (USA, 1997, 80 mins). Film begins at 8 p.m., Ramsey Auditorium, Wilson Hall. Admission $4. (630) 840-8000.

SEPTEMBER 22

Wellness Works presents: Top 5 Herbal Remedies, Alison Lapinski, Pharmacist, 1 West noon - 1 p.m.

SEPTEMBER 26

Prairie Seed Harvest 10-2. Follow on-site directional signs. Wear field clothing & gloves, bring pruning shears & paper grocery bags. Large groups please call ahead (630) 840-3303. Rainout info (630) 840-3000.

OCTOBER 1

Wellness Works presents a Brown Bag Seminar: *"Dealing With Loss & Change"*. The speaker is Laura Forbes MSW, 1 West noon - 1 p.m.

OCTOBER 3

Fermilab Art Series presents: *The Lark Quartet with Peter Schickele*. $19. Performance begins at 8 p.m. Ramsey Auditorium, Wilson Hall. For reservations or more information, (630) 840-ARTS.

ONGOING

NALWO coffee mornings, Thursdays, 10 a.m. in the Users' Center, call Selitha Raja, (630) 305-7769. In the 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.

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

LETTER TO THE EDITOR

Thank you very much for continuously sending me FermiNews. While browsing over a few pages of the issue 21-16, I have a few comments concerning your dictionary of High-Energy Acronyms (which would be very useful if accurate).

DESY "Deutsches" ... ("s" is missing)

KEK The High-Energy Accelerator Research Organization (not Research Accelerator)

Kamiokande: full name is not given there. I know few people know what is

..NDE. It is KAMIOKA Nucleon Decay Experiment (its original purpose)

Super-K is intended to study primarily solar neutrinos, although Atmospheric is an important byproduct. So "a solar neutrino detector" is correct.

Masataka Fukugita