

FermiNews

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Students from
Madison Junior High
School, in Naperville,
identify insects in
Fermilab's prairie.

Fermilab Receives its Fiscal 1998 Funding

Much of the allocation will fund continuing upgrades for Run II.

by Donald Sena, Office of Public Affairs

It's not the traditional definition of trickle-down economics, but Fermi National Accelerator Laboratory's annual budget allocation recently completed its long route from proposed spending bill to cash-in-hand.

The funds first emerged as a proposal from the executive branch, then traveled on to Congress and its committee-hearing-conference-maze, then back to the President's desk for a signature, to the Department of Energy, and

finally to Fermilab, where various Lab project managers were waiting to put those funds to work. Each step brought with it the traditional scrutiny, making the annual budget exercise a nerve-racking one, especially for those planning and finishing large science projects.

In the end, Fermilab received \$257.47 million for fiscal 1998, an increase of 0.8 percent from fiscal 1997. During the year,

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Education Programs for Teachers and Kids Survive

Grants to Friends of Fermilab keep the Laboratory's educational efforts afloat.

by Sharon Butler, Office of Public Affairs

As previously reported in *FermiNews*, the Fermilab Education Office was struggling to maintain its programs for elementary- and secondary-school children. Budget cuts in the U.S. Department of Energy in 1996 had eliminated a major source of funding, quashing ambitious plans for the future and cutting into existing activities. Last year, total funding for programs and infrastructure was down about 46 percent from its near-peak in 1995, the last year that DOE provided support.

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Photo by Reidar Hahn

Two Workers Burned in Electrical Accident

by Judy Jackson, Office of Public Affairs

On Wednesday, October 22, two employees of an electrical contractor working at Fermilab suffered burns in an electrical accident in the helium compressor room at the Tevatron FZero Service Building. The accident occurred shortly after noon as the workers were installing temporary wiring to run lights, heaters and an elevator in the building. The electrical feeder that normally supplies power to the building was shut down due to Main Injector construction activities in the area.

The injured workers, Charles Lasanska and David Hook, employees of Arbor Electric Company, were immediately transported to area hospitals. Lasanska, whose face and hands were burned, was taken by helicopter to the Burn Center at Loyola Medical Center in Maywood. Hook, whose hands were burned, was also taken to Loyola after initial treatment at Delnor Community Hospital in Geneva.

The two workers were installing wiring during construction activities for Fermilab's Main Injector accelerator. An electrical short circuit occurred, and the resulting flash burned the workers.

Fermilab Deputy Director Kenneth Stanfield ordered an immediate halt to electrical work on the entire Fermilab site and an investigation into the cause of the accident. Stanfield appointed an accident investigation committee led by Mary Grace, associate head of Fermilab's ES&H Section, and comprising Laboratory electrical and safety experts and a representative of the Department of Energy's Fermi Group. The committee invited John Brining, assistant business manager of Local 701 of the International Brotherhood of Electrical Workers, to serve as an observer.

Grace said the committee has made good progress in its investigation,



Photo by Reidar Hahn

A short circuit at this motor control electrical box caused burns to two workers.

interviewing all the principals, photographing the site, and reviewing documents. The committee will present a report to Fermilab Director John Peoples in the near future.

On October 29, Department of Energy officials began their own independent "Type B" investigation of the accident. Mike Saar, Industrial Safety and Fire Protection team leader at DOE's Chicago Operations Office, will lead the DOE Investigation Board as its chair. DOE Accident Investigation Program Manager Dennis Vernon of DOE's Office of Oversight in Washington will serve as deputy chair. The Board will consist of DOE employees, with expert consultants from industry and other laboratories.

"Our objective is to determine what happened, why, and how to prevent any recurrence," Vernon said. "We are not in a fault-finding mode. We will be looking at the accident from a systems standpoint, including examining management systems as potential root causes."

The DOE officials said they would use the materials gathered by the Fermilab investigating committee as "a good starting point" for their own work. However, both Saar and Vernon emphasized the importance of keeping an open mind when beginning an investigation.

"It's vital not to go into the investigation with any presumed

conclusions," Vernon said. "Time and time again, we find that our ideas can change a hundred and eighty degrees during the course of an investigation."

Meanwhile, as the investigations moved forward, both workers began the process of recovery. Hook, who is president and owner of Arbor Electric, a Batavia firm, said he returned to work the day after the accident. A week after the accident, he said his burned hands were improving rapidly. He added that doctors predicted it would take another week to determine whether skin grafts would be required for him or Lasanska. Lasanska returned home after a four-day hospital stay. Hook said it appeared that Lasanska had suffered no permanent damage to his eyes.

Hook praised the efforts of Fermilab emergency personnel. "They did a good job at the scene," he said.

Fermilab physicist Steve Holmes, Project Manager for the Main Injector project where Hook and Lasanska were working, said there is no doubt it was a serious accident.

"Our first concern was for the workers," Holmes said. "We are certainly happy that their injuries were no more severe than they were, and I am gratified to hear of the progress of their recovery. Obviously, something went wrong. There is no question about that. Now our task is to find out what that was and make sure it doesn't happen again." ■

Deer Meeting Draws Bow Hunters—and the Press

by Judy Jackson, Office of Public Affairs

Would-be hunters predominated among the attendees at a recent public meeting held to discuss the means to address Fermilab's overpopulation of white-tailed deer. Reporters were the next most numerous group.

About a third of the audience of approximately 50 in Ramsey Auditorium consisted of local bow hunters who saw the Laboratory's burgeoning deer herd as an opportunity to exercise their archery skills. The October 16 meeting received wide advance publicity, and a dozen members of the media also attended the informational gathering.

Fermilab and DOE jointly sponsored the meeting as part of a months-long effort to communicate with members of the community about Fermilab's deer problems and proposed solutions. Throughout the autumn, Laboratory staff have been working with the press, meeting with homeowners' associations, and talking with local officials to explain why and how Fermilab plans to control the size of the resident deer population and to listen to public concerns on the subject.

Maxine Hansen, of the League of Women Voters, led the meeting, presenting four speakers who explained aspects of the deer issue. Marty Jones, director of the Urban Deer Project of the Illinois Department of Natural Resources, provided perspective on Fermilab's deer problem within the larger context of deer overpopulation in northern Illinois and other urbanized areas. He said Fermilab joins a long list of neighboring organizations, including local forest preserves, airports, and Argonne National Laboratory, to arrive at lethal removal as the only practical means to cope with surging deer populations. Victoria Nuzzo, a biologist, described the ecological effects of deer overpopulation on the site.

Fermilab ecologist Rod Walton explained the proposed methods of lethal removal of deer, using sharpshooters from the U.S. Department of Agriculture's Wildlife Services team in a carefully controlled culling process. Walton stressed Fermilab's absolute concern for the safety of people on the site and in surrounding neighborhoods, and the need to employ the most humane methods of removal.

Gary Pitchford, of DOE's Chicago Operations Office, described the "NEPA process," the environmental analysis required by the National Environmental Protection Act before DOE and Fermilab can make a final decision on deer herd management methods. Pitchford outlined the various means for public comment on the proposed action, and invited audience members to come forward with their questions and concerns.

Whereas public meetings dealing with deer at other institutions have often drawn comment from those opposed to lethal means of removal, many of those who attended the Fermilab meeting proposed to take lethal methods into their own hands. Hunter after hunter stepped to the microphone to advocate hunting the deer with bow and arrow. Walton explained that the Laboratory's paramount concerns for human safety and humane deer removal methods, as well as efficiency concerns, ruled out hunting on the Laboratory site. Pitchford nevertheless encouraged the archers to express their views to the USDA through the NEPA process during the public comment period, which ended October 31.

Near the meeting's end, Steve Young, a sixth-grade teacher at a local school, rose to say that his students are among the many people who use the Fermilab site as a sort of "second back yard." He said his students regularly come to Fermilab to ride their bikes, rollerblade, and hike through public areas.

"I can assure you," Young said, "that if Fermilab were ever to consider any kind of hunting, this auditorium would be full of screaming suburban parents" concerned about the safety of their children.

Although it was not a requirement of the deer removal program, Fermilab's Walton said he is glad that the Laboratory and DOE held the public meeting.

"I am very glad that we took that extra step to keep our neighbors involved in what we are doing at Fermilab," Walton said. "I was a little surprised at the response we got, but I felt really good that we provided the opportunity for everyone to be heard, whatever their views might be." ■



Andrew Brandt

Physicist,
DZero experiment

I.D. #10103

by Sharon Butler, Office of Public Affairs

Physicist Andrew Brandt wasn't completely taken by surprise. He knew that Director John Peoples had nominated him for the Department of Energy's Young Independent Scientist Award. Then, after several months had passed and he had almost forgotten about the award, he received a call requesting information for a background check by the Federal Bureau of Investigation. He figured he must at least be on the short list for the FBI to go to all that trouble.

"They don't want to give an award to someone who cheats on his taxes or is behind in his alimony payments," he explained.

And sure enough. On October 14, DOE telephoned saying he had probably won the award, but the President hadn't yet signed off, so hold on. A couple days later, the official letter arrived on White House stationery.

As it turned out, Brandt had won, not the Young Independent Scientist Award, but the

prestigious Presidential Early Career Award for Scientists and Engineers. The award counts Brandt among 60 "gifted young professionals" this year who "exemplify the best of our science and technology community and will help set the scientific pace for the U.S. and the world in the years ahead," according to a White House press release.

The 34-year-old "young professional" broke the news to his family the day DOE called. He walked in the front door of his home, kissed his wife and said, cryptically: "I guess I'd better get a new suit." His wife looked puzzled. "Well, you can't expect me to go to the White House in jeans!"

She was ecstatic, of course. But the best reaction came from his teenaged son, who gave him a hug and said, "Way to go, Pop!"—just about the highest honor any father might crave from a thirteen-year-old.

His toddler, though, was blissfully unaware of the honor bestowed on his father. He was busy drawing stick figures with oversized bellybuttons and feet having one toe—one such world view proudly taped to the side of his dad's file cabinet.

Brandt claims he showed no special talent for physics as a child. He vacillated between mathematics and physics, until mathematics lost him in its abstractions; he preferred the concrete. Not only that, but his sophomore-year physics teacher at The College of William and Mary, Robert Welsh, inspired him to think more deeply about nature and its forces. Welsh would tell his students it was too late for him, but one of them might yet win the Nobel prize.

Why he was selected for the presidential award, Brandt says he doesn't know for sure, but it probably had something to do with the shiny stainless-steel flower pot he pulls out of his desk drawer. Brandt has proposed installing tiny "downstream" detectors inside similar flower pots on either side of the 5,000-ton DZero detector. These tiny devices would measure collisions in slightly scattered protons and antiprotons, as little pieces of protons called pomerons bump into quarks and gluons from other protons.

Brandt presented his proposal to the Physics Advisory Council on October 17. Preparations for the presentation are the excuse for the current uncharacteristic (so he claims) disorder on his desk.

Will the award now help win the panel's approval?

He answers without missing a beat: "Well, it can't hurt." ■



Photos by Fred Ullrich

HIGH-ENERGY PHYSICS

made painless

Triggers

by Sharon Butler, Office of Public Affairs

Proton-antiproton accelerators like Fermilab's Tevatron may be called discovery machines—a tribute to decades of frontier-breaking particle physics—but they are also sometimes irreverently dubbed colliding garbage pails.

“When [the protons and antiprotons] collide,” says Nobel laureate Leon Lederman, you get a lot of eggshells, coffee grounds, banana peels—and every now and then a pearl.”

The job of triggers is to get rid of the eggshells, coffee grounds and banana peels so that physicists can find and examine those pearls.

It's a challenging task. So much digitized information is generated in just a single second that it would fill one million floppy disks. That information has to be written onto magnetic tape, but even the fastest magnetic tapes can handle only 10 to 30 floppy disks of data each second.

Moreover, in Run I at Fermilab, there were nearly one million collisions per second. In Run II, luminosity will be even higher, increasing up to tenfold. And the time between collisions will be as much as 30 times shorter.

For the triggers, that will mean more garbage to throw out, and even less time—nanoseconds instead of microseconds—to “decide” whether a particle is a piece of eggshell or the signature of the Higgs.

That's why the trigger systems at both CDF and DZero need to be upgraded.

Generally, trigger systems have three levels—two rough cuts, followed by a sophisticated analysis.

The first level is crude: no fancy algorithms, hardware only (although these days even the hardware is programmable). The trigger samples each collision, or “event,” for a particular feature—energy deposits in the calorimeter or tracks in the “tracker” indicating the particles' momenta. If the event meets the criterion set in



Photo by Reidar Hahn

Gordon Watts, of Brown University, examines DZero's level-two trigger system.

the trigger—for example, an energy or momentum level above a certain threshold—the trigger fires, and the event's data are stored and sent on to level two. If the criterion is not met, the information is dumped. The decision must be made in split seconds, as collisions keep occurring and storage capacity is limited.

The second trigger level relies on preprocessors, simple computational devices, to find basic patterns. The analysis is somewhat more refined than in level one. Moreover, the trigger may look for certain combinations of data. For example, it might be set to select an event that has a massive particle by measuring the angle between two jets. Or it might look for a jet with a displaced vertex—a sign that the event could be a *b* quark decay. Again, when the criterion is not met, the data are

discarded; when the criterion is met, the data are saved.

Finally, level three consists of a farm of fast computers that do complex analyses. The computers need to be fast because data from about 1,000 events are flowing in every second. The triggers are no longer looking for one feature or a combination of a couple features. All the information from an event is combined and fed to a single computer. The computer looks at the assembled data—from the trackers, the muon chambers, the silicon vertex detectors, etc.—and decides whether the event is indeed worthy of study and, so, should be written down in magnetic tape.

Then, at last, the physicists step in to determine whether they have just found the top quark, the Higgs boson—or just an old tea bag. ■



In the Lederman Science Center, a student examines pond water.

Education

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But Friends of Fermilab has come to the rescue. Founded in 1983, Friends of Fermilab is a not-for-profit organization that secures public- and private-sector grants for Fermilab's precollege programs. While Friends of Fermilab has long raised money to support these programs, budget cuts make the grants especially crucial this year in ensuring the continuation of Fermilab's numerous educational efforts for school teachers and their students.

New workshops and Internet courses

From the U.S. Department of Education, Friends of Fermilab has won, on behalf of Leon Lederman, former director of Fermilab, a \$64,300 grant to hold a three-day workshop for a national group of education experts. The purpose of the workshop is to develop what Lederman calls the "scaffolding" for his proposed three-year high-school science curriculum. The curriculum—a "coherent integrated sequence"—stands the usual

curriculum sequence on its head, starting with conceptual physics, continuing with chemistry and then biology, and emphasizing throughout the connections among all three sciences.

Fermilab's Education Office will organize the workshop, publish a summary of the proceedings, and produce a more elaborate document laying out the curriculum.

Another \$6,000 has come from one of Fermilab's neighbors: Wheaton-Warrenville school district 200, which won a Technology Challenge grant from the state of Illinois. Under the grant, the school district is developing a fourth- through sixth-grade course, in partnership with Fermilab, the Forest Preserve District of DuPage County, the Conservation Foundation and the Wheaton Park District to teach kids how to use Internet resources in learning about ecological issues.

"We're the fifth grade, and we're the prairie," said Marge Bardeen, head of the Education Office.

With the help of teachers experienced in developing instructional tools, the Education Office is designing an elaborate Web site incorporating data on the Laboratory's prairies (for example, information on the ecosystem's plant, insect and bird species, and historical data on biodiversity tallied by students on field trips here). Kids will learn to access the data for projects, and will produce reports electronically. In the spring, Fermilab will hold a workshop to introduce 11 Wheaton school teachers to the new Web site.

Innovative science curricula

A Science Literacy grant from the Illinois State Board of Education will support a second year of Fermilab's four-year ARISE (American Renaissance in Science Education) project.

"It's been wonderful," said Bardeen, noting that earlier funding paid for the development of the popular prairie programs held at Fermilab's Leon M. Lederman Science Education Center (see page 7).

Six high schools, each with a team of three or four teachers, are participating in ARISE, two from the city of Chicago, two from suburbs and two from rural areas. Bardeen calls the project "Fermilab's version of Lederman's national project." It helps the teachers develop a three-year standards-based science curriculum that places special emphasis on demonstrating the links among physics, chemistry and biology. Details are left to the teachers. Two schools, for example, are teaching physics the first year, while four schools are integrating physics with the other sciences. The money provides stipends for teachers so that they can spend



Photos by Reider Hahn

Teachers and students explore the prairie.

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Two increasingly popular educational units sponsored by the Fermilab Education Office are *Beneath the Ashes* and *Particles and Prairies*.



Photo by Reidar Hahn

Experience the Prairie

Over at the Prairie Interpretive Trail, tiny heads bob up and down, and oohs and aahs rise from the high tawny grasses. Bundled up in brightly colored parkas and woolen caps, the children gather around a specimen of the alliterative mountain mint, sniff at its crushed leaves and guess at its identity.

Across the way, clusters of older students in oversized Bulls jackets and Green Bay Packers sweatshirts are testing the wind, netting insects, and measuring the moisture in the soil.

The school children are all here as part of two increasingly popular educational units sponsored by the Fermilab's Education Office, *Beneath the Ashes* and *Particles and Prairies*. In one month alone (from September 15 to October 15), 4,450 children from 58 schools came to Fermilab to experience the prairie.

The units, developed by teachers and ecologists, generally involve classroom instruction, followed by a field trip to Fermilab and sessions back at school working on projects. Teachers may bring their classes here only after participating in a workshop where they learn about the prairie ecosystem and review the student and teacher materials.

The *Beneath the Ashes* field trip, for kids in grades 3, 4 and 5, includes a nature walk and a visit with the bison. Docents share Indian lore

and information about the plant and animal life. They might have the children write a collective poem about the prairie, or play the parts of rabbits, foxes and hawks—predators and prey—learning why certain animals seek shelter in the part of the landscape called the transition zone.

Particles and Prairies gives children in grades 6, 7 and 8 a unique opportunity to participate in ongoing research. Out in the field, the kids do quadrat studies, recording the diversity of plants in one-square-meter plots. They collect abiotic data, using light meters, psychrometers, and other tools. They catch insects and catalogue their findings. They analyze the water in the pond, including its oxygen levels and animal life. The compiled information helps Fermilab staff monitor the evolution of the site's restored prairie ecosystem. In the Lederman Science Center laboratory, at different stations, the children examine insects under a microscope, weigh a live beetle and a dead one, hunt for organisms in a petri dish filled with pond water, and analyze data on the Web on the numbers of bird species recorded at Fermilab since 1987. They also study the award-winning *Particles and Prairies* videodisc, developed by Liz Quigg, of the Computing Division.

Education

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summers developing their curricula and exchanging ideas with colleagues here at Fermilab and back in their schools. The money also enables participants to teach four classes instead of the usually required five when they first teach the course. Schools are paid to hire substitutes to teach the extra class. That gives the teachers the time they need to develop their material. Fermilab will be writing case studies analyzing the different programs to help other schools revise their own curricula.

"I keep telling [the participating schools]: I hope you'll be different. That way, we'll learn more," said Bardeen.

Finally, pending budgetary approval by Congress, Friends of Fermilab will be awarded a \$125,000 grant from the North Central Regional Technology in Education Consortium, one of six regional consortia

funded by the U.S. Department of Education. NCRTEC's mission is to help schools develop the technology tools and skills to promote what is generally referred to as "engaged learning," or learning by doing.

The grant will support several projects. One is The Fermilab LInC Online, the Leadership Institute Integrating Internet, Instruction and Curriculum, a program designed and taught by Laura Mengel, of the Computing Division, to create a network of leadership teams spurring educational changes that take advantage of new technology. The 80-hour LInC course, begun in 1995, develops participants' Internet skills and assists them in creating engaged-learning projects. While LInC originally was an on-site program supported by the state's Scientific Literacy Grant Program, NCRTEC is interested in having Fermilab run the course on-line so that teachers not just in Illinois but all across NCRTEC's eight-state region can benefit. Fermilab will also hold what NCRTEC calls "facilitators' academies," where participants from the region will learn how to teach the course using the LInC materials available on the Internet.

Virtual physics playground

Also under the grant, Bardeen and Liz Quigg, of the Computing Division, are designing a "virtual physics playground," an on-line version of exhibits at the Science Education Center for kids who can't come to Fermilab. And Susan Dahl, in charge of the Teacher Resource Center at the Science Education Center, is working on a pilot project that will develop guiding questions and perhaps a template to assist teachers in identifying good multimedia products and teaching/learning strategies for using such products in their curricula.

Finally, apart from the Friends of Fermilab grants, the Education Office expects to receive \$227,000 from the National Science Foundation and DOE, the last installment of a five-year grant for a program that helped school teachers develop "an inquiry approach to teaching science," said Bardeen.

Bardeen is obviously pleased with the level of support for Fermilab's educational programs for teachers and their students—support that has come from within Fermilab and outside. "We've been very fortunate," she said.

But Bardeen won't rest just yet. Even with the grants from Friends of Fermilab, the budget still supports only what she and her staff consider minimally necessary to maintain a viable program. ■



Photo by Reidar Hahn

Laboratory exercises help students learn about insects and plant life.



Peter Garbincius, CZero area project manager, standing above the accelerator berm near the CZero interaction region.

Budget

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Fermilab will see the Main Injector project team use its final allocation to finish the 6-year, \$230 million endeavor. The two collider detectors and affiliated projects will also get a strong influx of funds to keep the upgrades on schedule for the beginning of Run II in early 2000. Fiscal 1998 also contained some new budget line items. The Neutrinos at the Main Injector project and the CZero area each received about \$5 million to begin work on two of Fermilab's newer experiment initiatives.

All said, according to Deputy Director Ken Stanfield, the total Fermilab budget remains basically flat-flat, which means it doesn't account for inflation thus reducing spending power. The base program funds, which include salaries, facilities operation, capital equipment and overhead, rose about six percent, most of which goes for the collider detector upgrades. Line items fell 20 percent.

"It's not bad, but it's not good either," said Bruce Chrisman, associate director, referring to the fact that while Fermilab's total funding didn't increase in spending power, it wasn't hit with a cut.

Chrisman added that fiscal 1998 spending is helped by the fact that Fermilab shut down its beam in September 1997 and will not start again until 1999, saving millions annually in electricity and cryogen costs. The shutdown is necessary to complete the civil construction on the Main Injector and adjoining beamline projects.

The money recently came to Fermilab after the Senate and House of Representatives agreed to the conference report—the document that works out the differences in the House and Senate versions—on September 30.

The enrolled measures were subsequently signed in each institution before moving to the President's desk on October 1. On October 13, the measure became Public Law 105-62. The money then traveled to the Department of Energy. DOE gave Fermilab about 25 percent of the allotment right away, and the rest will come in late November or early December, according to Chrisman. Fermilab budget handlers and management were busy in the last weeks of October allocating the money around the Lab based on priorities.

The Main Injector and collider upgrades

With this latest budget came the Main Injector project's last installment from Congress. The \$30.95-million allocation completes the \$229.6-million line item. Steve Holmes, Main Injector project manager, said for the first time he can completely forget about funding and concentrate on getting the project finished.

"It means that securing funding is not a worry now. The worry is getting the thing done with the money we have," said Holmes.

The Fermilab physicist said funding was more unsteady in the early years of the project. In fiscal 1992 and 1993, the actual allocations were less than the funding profiles that were used for planning. As a result, Holmes said the project team kept having to alter their schedule and plans. However, in fiscal 1994, the allocations matched the profile for the first time, and that remained the case for the remainder of the project, allowing Holmes and his team to design and adhere to a final schedule that will eventually bring the project in under budget and on time.

Fermilab will also allocate funds to the two collider detector collaborations for their upgrades. DZero and CDF are scheduled to receive \$14.7 million each for fiscal 1998. Both detectors must undergo critical upgrades to accommodate the increased luminosity provided by the Main Injector. Moreover, any upgrades at a cutting-edge science laboratory must have a certain parallelism. Once the Main Injector places those extra particles into the Tevatron, resulting in extra collisions at CDF and DZero, the detectors, in turn, must hand over the increased data to the computers for reconstruction and analysis, among other functions. The computing infrastructure can expect 20 times more data than in Run I. Fermilab will allocate about \$2 million for fiscal 1998, with the bulk of the computing-upgrade money coming in fiscal 1999 and 2000, according to Steve Wolbers, associate head of the Computing Division.

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Photos by Reidar Hahn

Components for the DZero and CDF detectors are under intense development and construction at Fermilab.



Photo by Reidar Hahn

Pictured here is part of the solid scintillator detector for MINOS, the long baseline part of NuMI. The collaboration chose a solid scintillator as opposed to a liquid or gas version.

Budget

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CZero area

Two new Fermilab projects received their first funding allocations with this budget. The CZero interaction region project received a line item of \$5 million to build an experimental hall. Peter Garbincius, CZero area project manager, said \$3 million will go toward building the experimental hall, service buildings and accelerator tunnel modifications. A total of \$1 million will serve as contingency, and the last chunk will go toward overhead and engineering. Garbincius said his team will complete the hall during the year-long shutdown. He said it is imperative for them to complete the accelerator interaction region first, as that must be finished by the time beam goes up. Garbincius said this step is just the beginning of an exciting project.

This year "we will build a bare building. Then we will have to fill it up with experiments and all sorts of good stuff," said Garbincius.

NuMI

The other effort to receive its first funding outlay was the Neutrinos at the Main Injector project. It received \$5.5 million, the first chunk of what the collaborators hope will be steady funding. Bob Bernstein, a member of the collaboration, said the funds will go toward civil construction. The project team hopes to have the facilities built and the experiment running by around the turn of the century. The complex experiment will send a beam of pure muon neutrinos into detectors on both the Fermilab site and in a mine in Soudan, Minnesota. Experimenters will check to see if any of the muon neutrinos have changed—or oscillated—into another flavor of neutrino, proving the elusive particles have mass.



Photo by Lynn Johnson

Fermilab is also building up its infrastructure with new electric substations.

LHC/CMS

Not included in the Fermilab allocation, but still expected to come to the Lab via DOE, is money to help with the construction of the Large Hadron Collider, the new particle accelerator being built at CERN, the European Laboratory for Particle Physics. When operational around 2005, the LHC will take the energy frontier away from Fermilab's Tevatron accelerator. The Lab will also receive funds for U.S. participation in CMS, one of the detectors that will be placed on the LHC ring. The fiscal 1998 budget from the federal government included a total of \$35 million for U.S. participation in the LHC accelerator and its two collider detectors; that money will be spread among several labs and university groups. Fermilab is providing project management for the U.S. contribution to the accelerator and to CMS. For the accelerator portion, Fermilab will receive part of the money for design and construction of the interaction region quadrupoles, project management costs and some accelerator physics. Chrisman said some of the U.S. CMS funding will be "pass-through" money, in which Fermilab passes the money onto universities around the country who are working on some portion of the detector.

Other costs

In addition to the science experiments and facilities, Fermilab must also use part of the budget for infrastructure repair.

"The Lab is now 30 years old, and things are beginning to require attention that in the past we haven't given as much attention because we were considered a new lab," said Chrisman. "In order to have reliable operations, we can't ignore them anymore."

For instance, Chrisman said Fermilab must replace and repair some industrial water chillers. In addition, the Facilities Engineering Services Section will repair and replace critical electric feeders, ensuring a more reliable flow of electricity. The Lab will also be studying other infrastructure needs and planning how to attack them. One project includes the rehabilitation of Wilson Hall; while some concept design studies will continue, the Lab will spend money in the future to make necessary repairs to its signature building, according to Chrisman. ■

Chez Léon

M E N U

Lunch served from
11:30 a.m. to 1 p.m.
\$8/person

Dinner served at 7 p.m.
\$20/person

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

Lunch Wednesday November 12

Green Chili and
Cheese Quesadilla
Vegetable Stew
Chocolate Pecan Pie

Dinner Thursday November 13

Fettuccine with Artichokes,
Sun-dried Tomatoes and Walnuts
Swordfish Kebabs with
Orange Avocado Sauce
Red Pepper and Rice Pilaf
Pear and Walnut Cake
Lemon Custard Sauce

Lunch Wednesday November 19

Grilled Flank Steak with
Oriental Vegetables
Melons and Litchi Nuts

Dinner Thursday November 20

Minestrone Pasta with Shrimp,
Tomatoes and Arugula
Beet, Walnut and
Gorgonzola Salad
Mocha-Orange Cheesecake

BENEFIT NOTE

CUT YOUR MEDICAL AND DEPENDENT CARE COSTS

Although the Laboratory offers comprehensive health coverage, certain health expenses such as deductibles, copayments, eyeglasses, contact solutions, and hearing aids are not covered. Also, although the Laboratory offers on-site day care, the costs of child care as well as care for the elderly or a disabled dependent can quickly add up. If you incur these kinds of costs, you can get some relief by signing up for one or both of the reimbursement accounts offered through Fermilab's Flexible Benefits Plan.

Reimbursement accounts allow employees to withdraw tax-free dollars that they set aside through salary reduction to pay for eligible health care and dependent care expenses. Using before-tax dollars to pay these expenses effectively lowers their actual cost.

Open enrollment for these accounts is held during the month of November. All employees except dayworkers and summer employees may set aside up to \$2,000 in the Health Care Reimbursement Account and up to \$5,000 in the Dependent Care Reimbursement Account.

All those who want to sign up for calendar year 1997 must complete new forms. Employees currently enrolled were sent new forms; all other employees should contact the Benefits Office, 15WHSW, M.S. 126, x3395, for enrollment forms or information. Detailed information can be found in the summary description, called URA/Fermilab Flexible Benefits Plan, which was distributed to all employee shortly after establishment of the plan and included in new employee's orientation packet. (The summary plan description is also on the Web at <http://fnalpubs.fnal.gov/benedept/welcome.html>.)

Completed forms must be returned to the Benefits Office by the close of business on November 26, 1997, for coverage to be effective on January 1, 1998.

LETTER TO THE EDITOR

I looked up "Deconstructing" which appeared in the headline of the October 10th issue of the *FermiNews*. I learned that it is a philosophical theory of literary criticism.

I am now looking up "de-installation." This word popped up all over in the Beams Division when we began to de-assemble the CØ and FØ regions.

Could it be that we are becoming bored with high-energy physics and are shifting some of our efforts into de-arranging words? I am already hearing about Pbar "de-acceleration" studies. Not wishing to be left behind, I want to be the first to propose a new name, the Fermi National AntiDeAccelerator Laboratory.

~ Fritz Lange

CALENDAR

NOVEMBER 8

Fermilab Art Series presents: Paul O'Dette, \$14.
Performance begins at 8 p.m. in Ramsey Auditorium, Wilson Hall.

NOVEMBER 9

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

NOVEMBER 13

Wellness Works presents a brown bag seminar, "Dealing with Difficult People," Samuel Rest, Ph.D., Clinical Psychologist, Rush-Copley Medical Center. Noon-1 in 1West.

NOVEMBER 14

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

Fermilab International Film Society presents: *Maborosi (Maboroshi no hikari)* Dir: Hirokazu Kore-eda, Japan (1995). Admission \$4, in Ramsey Auditorium, Wilson Hall at 8 p.m.

NOVEMBER 16

Barn dance at the Village Barn from 2-5 p.m. The dance features live music by Jimbob and calling by Dan Saathoff. The dances are contras, squares, and circle dances. All dances are taught, and people of all ages and experience levels are welcome. You don't need to come with a partner. Admission is \$5.

Children under 12 are free. The barn dance is sponsored by the Fermilab Folk Club. For more information, contact Lynn Garren, x2061, or Dave Harding, x2971.

NOVEMBER 18

Wellness Works presents: blood pressure screening. From 11:30-1 in the atrium by the credit union.

ONGOING

NALWO coffee mornings, Thursdays, 10 a.m. in the Users' Center, call Selitha Raja, (630) 305-7769. In the Village Barn, international folk dancing, Thursdays, 7:30-10 p.m., call Mady, (630) 584-0825; Scottish country dancing Tuesdays, 7-9:30 p.m., call Doug, x8194.

FOR SALE

■ '94 Mercury Grand Marquis LS, full leather interior, med. blue color, 68K miles, ABS, special aluminum wheels w/spare, am/fm cassette. Extra clean, heavy duty engine and suspension, \$13,000. Call Norm Engler (773) 227-0691.

■ '93 Ford Explorer XLT, 4x4, 4 door, 4.0 liter V-6, at, ps, pb, pw, pl, ac, tilt, cruise, sun roof, am/fm cassette, 62K miles, excellent condition, \$14,500. Call Ron, x8864 or (630) 466-1823.

■ '93 Ford Ranger XLT, extended cab, 4.0 liter V-6, 5 speed, ps, pb, ac, am/fm cassette, sliding rear window, tonneau cover, bed mat, 41.5K miles, excellent condition, \$9,000. Call Ron, x8864 or (630) 466-1823.

■ '91 Harley FLHTCU two-tone burgundy/red, Some additional chrome, totally stock motor, carb & pipes, 38K miles. Asking \$14,000. Call Ray, x3671 or safarik@fnal.gov.

■ '90 Geo Metro convertible, 42 mpg, 5 spd, am/fm cassette, 95K. Runs great, but hail dents on hood, \$795 obo. Call Andreas, x3753 or ask@fnal.gov.

■ '90 Honda Accord, 5 spd., am/fm cassette, 4-door. Some dings but runs great. Very reliable and had comprehensive tune-up in late summer. \$4,000 obo. Call Don, x5678 or (312) 664-0515.

■ '88 Ford Escort EXP, 3-door, automatic, power steering, sun roof, am/fm cassette, ~71K miles, runs well, \$1500 obo. Call Pete, x8607 or tamburello@fnal.gov.

■ '84 Corvette, 68K, auto, Boze, loaded, extra clean, 2-tone bronze/bronze lthr int., new tires/exh. sys., \$10,600. Call Lois, x4372 or (630) 393-2183.

■ Condo: 2 bedroom, 2 bath in Warrenville's Emerald Green. Central air, wood-burning fireplace, wall-to-wall carpeting, dishwasher, disposal, gas oven. Nice location, 5 mins to I-88. Beautiful grounds, lake, clubhouse, pool, sauna, \$96,500. 2 S 424 Emerald Green Drive, #42. Call Mary Kay, (630) 420-2002.

■ Skis, Atomic Arc 195, Salomon 547 Sport Bindings, size 12 US or 13 EU Trappeur 2000 boots also have poles, ski & boot bag \$200 obo; Head Skis older style bindings \$25; Kenwood multi-component stereo system w/cabinet. System includes linear tracking turn table, amplifier ka-94, synthesizer am/fm tuner kt-54 (memory holds 14 am & 14 fm stations), graphic equalizer ge-34, dual deck cassette recorder kw-64w, cd player dp-840, 2 4-way 150 watt speakers jl-840. \$2000 obo. Call Terry, x4572 or e-mail skweres@fnal.gov

■ PowerMac computer system w/ printer: includes PowerMac 6100/60 a/v, 8m ram, 1 gig total hd space (w/ Apple ext. hd), Apple audiovision 14-in. monitor, 28.8 geoport modem, ethernet connection, ext. keyboard, mouse, Apple color stylewriter pro inkjet printer, all necessary cables, loaded w/MS Office, other business apps & an enormous amount of expensive games. Great condition, try it out first! Asking \$999 or best reasonable offer. Contact Justin, x2676, (630) 682-1721, or donoho@fnal.gov.

■ Moving sale: small Toastmaster microwave oven \$20. Aerobic rider \$50, sells new for \$130. Long rectangular mirror wall clock w/pendulum \$10. Large Weber kettle grill only \$20! Two-drawer file cabinet \$10. Spacesaver free-standing 3 shelf unit for above toilet, white removable shelves w/brass accents, exc. cond. \$15. "Bionaire" 2 gallon table or desktop humidifier \$10. Perfect for an office. "Sango" china dinnerware. Pattern "black lillies." Square plates w/rounded, upturned corners, black on white background, 3 large single calla lillies. Service for 8, w/two, 5-piece serving sets, matching black handled flatware, drinking glasses & black stemmed wine glasses. China still in original boxes. Value over \$300, only \$75 for all! Peppers king size waterbed w/mirrored, lighted bookcase headboard \$90. Small lightweight vacuum, not an upright, \$40. Tires & wheels. Goodyear Arriva II tires, size 215-70r-14 mounted and balanced on GM 5-bolt wheels. Fits Cutlass, Monte Carlo, etc. Like new, \$90/set of 4. Please call (630) 443-9881. Leave message indicating items interested in and an evening number to return calls.

■ Baby Cockatiels - hand fed from 2 weeks of age, very sweet and lovable - \$35 each call Edie at x3621 or (815) 496-9434.

■ House: 4-bedrm ranch, Batavia, 2 bathrm, large eat-in kitchen, living room, family room. 2-car detached garage with storage room. Large yard w/mature trees. Geneva schools. \$129,900. Call Peter or Penny (630) 879-0837 (evenings).

FOR RENT

■ Near downtown Batavia, two bedroom upper apartment available Nov 1. Oak floors, washer & dryer included. Private parking. \$650 per month w/utilities. Security deposit required. Please call (630) 879-6911 for an appointment.

WANTED

■ Any kind of baby car seat. Monique, x3956 or Srivasta@fnal.gov.



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