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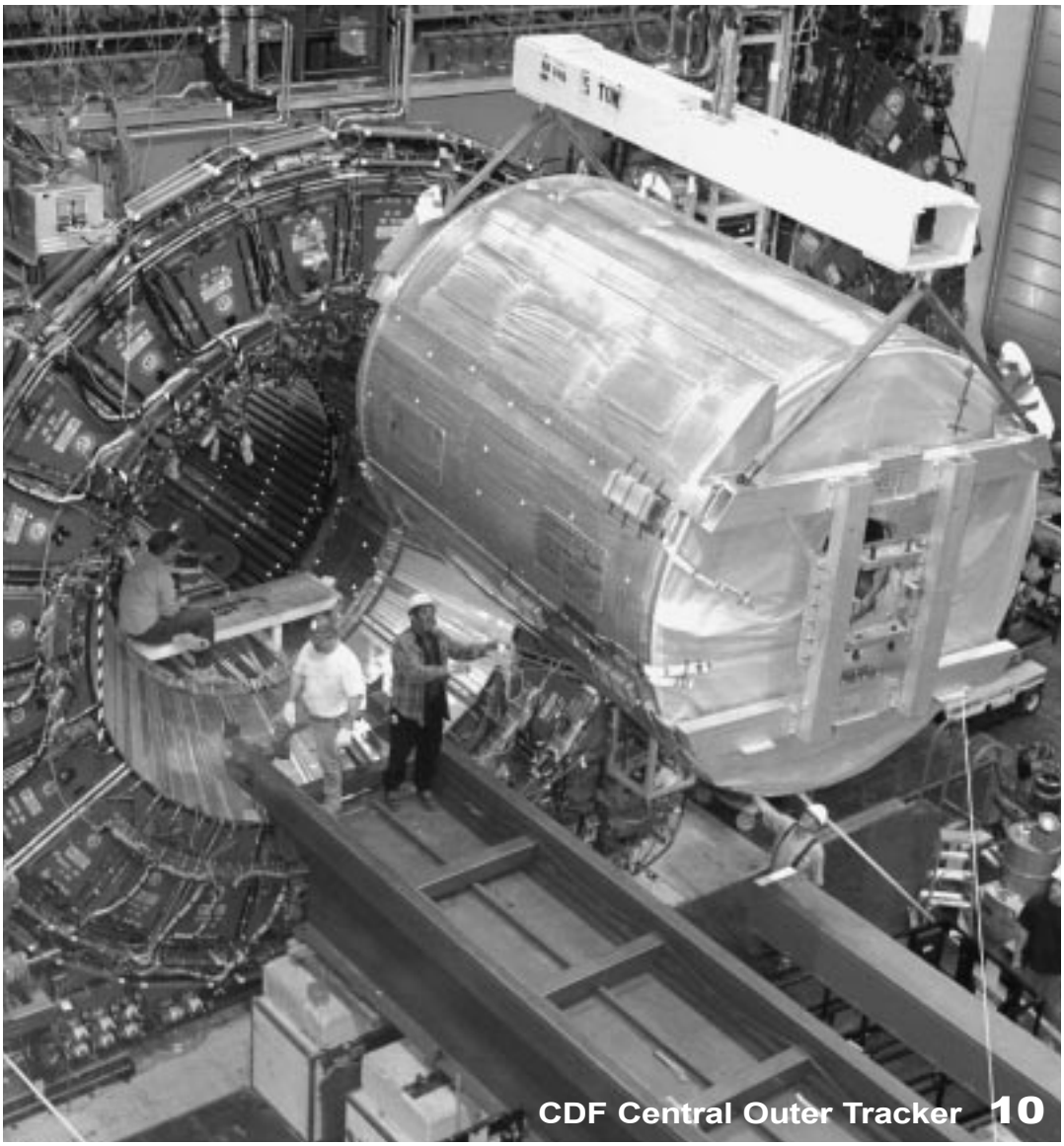

CDF Central Outer Tracker 10

Photo by Reidar Hahn

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INSIDE:

House Science Committee Chairman James Sensenbrenner Jr. addresses the media after his tour of Fermilab. Opposite page: viewing a model of the lab site are (from left) Associate Director for Accelerators Steve Holmes, Sensenbrenner staffer Harlan Watson, Fermilab Director Michael Witherell and Chairman Sensenbrenner.

FERMILAB HAS *Critical Role* in Next Machine

by Mike Perricone

Sensenbrenner:

Representative James Sensenbrenner Jr., (R-Wis.), chairman of the House Science Committee, left no one in the dark about his opinion of Fermilab.

"Fermilab is the jewel in the crown of scientific institutions in the United States," Rep. Sensenbrenner said after a tour of the lab on March 15, including a visit to the manufacturing facility for superconducting magnets critical to the success of the Large Hadron Collider at CERN, the European particle physics laboratory in Geneva, Switzerland.

"Some of the other places I've been, I've seen big managerial problems and cost overruns," he continued. "That's not the case here, and that's the way we want it to be. This place is well managed. Fermilab has a mission, and it accomplishes that mission."

Soon after becoming chairman of the science committee, Sensenbrenner played a critical role in the 1997 negotiations leading to the $531 million agreement for U.S. participation in LHC. He remains firm in his conviction that international cooperation is essential in building the next "big machine," the accelerator that will take particle physics beyond the energy frontier established when LHC begins operating around 2005.

"LHC is not the end of the line," Sensenbrenner said. "A new accelerator will be the next logical step, but the funding will be beyond the means of any single country. It must be an international effort. In 1997, we developed the agreement regarding CERN that took the debate out of the political arena. The Europeans pledged they would support the next generation machine anywhere in the world, something that didn't happen during the SSC [Superconducting Super Collider] fiasco in the 1980s."

At the lab's Industrial Center Building, Sensenbrenner saw cable being wound for LHC magnets under construction. Fermilab director Michael Witherell noted a level of cooperation on the project between the Department of Energy and the National Science Foundation that offered "a model of agencies working together, building cooperation that is important for the future." Witherell also emphasized that in contributing to LHC, Fermilab had rebuilt its capability to produce superconducting magnets for the future—and for a future accelerator.

Science Committee chairman says *LAB* is *"jewel in the crown"* of research institutions

US/LHC project manager Jim Strait of Fermilab said that the cooperation with CERN created the groundwork for the level of direct international cooperation necessary in building future "world" accelerators. Fermilab's Dan Green, project manager for the US/CMS collaboration contributing to the Compact Muon Solenoid detector for LHC, described the support of DOE in helping create a favorable funding profile that saved money by allowing many costs to be met up-front instead of delaying payment.

Looking ahead, Sensenbrenner saw "an increased role for Fermilab after LHC is up and running." He cited the need for advanced research and advanced planning for the next machine, wherever it is built, and said Fermilab is "as critical to the manufacture of that machine as it is to LHC."

But he also acknowledged the difficulties posed by the Federal budget proposals for FY2001. Fermilab faces a shortfall of some $33 million, posing serious threats to several major experiments despite large increases in other areas of science. Sensenbrenner pointed to continuing budget negotiations this summer.

"DOE science has not been dealt with well," he said, "particularly in comparison to the National Institutes of Health and the National Science Foundation. We must remember that many of the breakthroughs in medicine use as their essential building blocks many of the developments of high-energy physics. These budgets have got to go up together, to make sure our money is effectively spent."

Sensenbrenner indicated that the current budget numbers were not the final answer.

"We're going to make sure Fermilab remains one of the crown jewels of scientific research," he concluded. "We're going to make sure that the lights stay on at Fermilab."

Sensenbrenner examines literature and component parts for LHC with US/CMS project manager Dan Green looking on.

The DESY Fermilab Connection

by Kurt Riesselmann

July 3rd, 1983: Ferdinand Willeke, physicist from the German high-energy physics laboratory DESY (Deutsches Elektronen-Synchrotron), witnessed the Tevatron setting a new world energy record. “I happened to be on shift when acceleration up to 512 GeV was accomplished,” says Willeke. “I was in the team of Frank Turkot and Hans Jöstlein, and I was declared ‘accelerator physics expert’ of this team. It was great fun and very, very interesting. I still like to remember these days.”

And so does Fermilab.

“Fermilab was quite a beneficiary of this collaboration,” summarizes former Fermilab director John Peoples. “Siegfried Wolff and Hartwig Kaiser, physicists from DESY, contributed a lot to the development of the Tevatron magnets, the first use of superconducting magnets for building a high-energy accelerator.”

The collaboration also benefited DESY. Wolff and Kaiser, returning to Hamburg, used their knowledge gained at Fermilab for the design of the superconducting magnets needed for the new HERA accelerator, Germany’s prime high-energy collider. As a result the “HERA magnet” with cold iron yoke was developed, providing an increase in magnetic field strength of about 20 percent compared to the original Tevatron design.

R&D for a Superconducting Linac

The story of successful DESY-Fermilab collaborations entered a new chapter in the early 1990s when former DESY director Björn Wiik proposed an R&D program for a future superconducting linear accelerator. Helen and Don Edwards, husband and wife, both veterans of the Tevatron magnet program, were immediately interested.

Helen Edwards, in 1992 a member of the machine advisory committee at DESY, became the first project manager for the TESLA test facility (TTF) in Hamburg. She and Don have spent many months at DESY Hamburg ever since.

Photo by Jenny Mullins

Helen Edwards received several awards for her scientific achievements, including the prestigious MacArthur Fellowship Award.

“He did have a vision,” Helen says of Wiik, who died in a tragic accident in 1999. “That’s why I am interested in TTF.”

Many Fermilab engineers contributed to the success of TTF. Mark Champion (couplers), Tom Peterson (cryogenic design) and Dan Wolff (modulators) are the people who were most closely involved in the collaboration. Champion and Peterson both worked more than a year in Hamburg. Peterson also is credited with the development of the vertical test stand used to check the quality of the superconducting cavities at TTF.

Photo by Reidar Hahn

Klaus Flöttmann and Don Edwards working at the photoinjector.

Albrecht Wagner, director of DESY, acknowledges that "the tremendous progress made in super-conducting radiofrequency (RF) acceleration in TESLA would not have been possible without the strong engagement of Fermilab."

A highlight of the DESY-Fermilab collaboration on TTF was the construction of the RF gun, a device used to create a high-quality electron beam. It was designed and built by Fermilab engineers and scientists. In 1998 it was installed at the TTF facility of DESY Hamburg.

"The RF gun is a very sophisticated device," comments Reinhard Brinkmann, project manager of TTF. "We operate it day and night, seven days a week. It is extremely reliable, constantly proving Fermilab's competence."

In 1994 Peoples, at that time director of Fermilab, also wanted the lab to become involved in photo-injector physics: "I wanted to have something here at Fermilab that was part of TTF, some work that was sort of pushing the envelope. I thought that accelerator technology was very valuable for

Co-operation beyond accelerator technology

The DESY-Fermilab cooperation is not limited to beam and accelerator technology. Matthias Kasemann, physicist and former DESY employee working in the ZEUS detector group, came to Fermilab in 1998. He became head of the Fermilab Computing Division, a group of about 250 computer scientists, electrical engineers and physicists. Kasemann emphasizes that "the interdisciplinary setup of Fermilab's computing division is very positive," an aspect that eventually led him to accepting Fermilab's job offer.

Kasemann has contributed to the DESY-Fermilab connection beyond his personal story. He has initiated an ongoing DESY-Fermilab co-operation on the development of mass storage. Both DESY and Fermilab use similar components, including commercial tape robots for data recording. To store data more efficiently, DESY extended its software to steer the tape robots. Fermilab, which faces unprecedented amounts of data when Tevatron Run II starts in 2001, joined DESY's efforts. In addition to the work done at Fermilab's Feynman Computing Center, Charles Waldmann, computing engineer in Fermilab's Computing Division, spent three months at DESY Hamburg to work on subsystems of tape recording software that will be used jointly at Fermilab and in the DESY system.

Photo by Reidar Hahn

DESY alumnus Holtkamp receives Fermilab Employee Recognition Award

Norbert Holtkamp was looking for a new physics project when Helen Edwards, then project manager at DESY's TTF, suggested he should think about joining Fermilab. Holtkamp, intrigued by the idea of living in the United States, saw the great opportunity of helping to define Fermilab's future accelerator agenda. In 1998, twelve months after Edwards' proposal, he moved to the United States.

His wife and two sons originally were a little skeptical about leaving Hamburg. Things changed when he told his sons about living in a house with a garden big enough to keep a dog, something that did not seem possible when living in Hamburg. Eventually his family accepted, and a dog became the fifth member of the Holtkamp family soon after their arrival.

Holtkamp quickly managed to establish himself as an expert on accelerator technology for future machines. Together with David Finley he coordinated the technical study for a future neutrino factory, a machine that would use a muon storage ring to produce the most intense neutrino beam ever produced on earth. Their report, complemented by the report of Steve Geer and Heidi Schellman (Northwestern University) on the physics study, has received recognition by high-energy specialists around the world. Holtkamp, Finley and Geer were honored with a Fermilab Employee Recognition Award on May 8.

Photo by Reidar Hahn

Photo courtesy of DESY

Albrecht Wagner, director of DESY.

Fermilab to know. Then Helen proposed the idea of the photoinjector."

The construction of the Fermilab photoinjector, in design similar to its TTF counterpart, was again a truly international collaboration, with DESY providing a nine-cell TESLA cavity and INFN Milan contributing a cathode preparation facility. Further input came from several U.S. universities, including the University of Rochester, and HEP institutes around the world.

Beam dynamics studies at Fermilab's photoinjector are relevant for a future low-emittance linear collider. The results are important both for the Next Linear Collider (NLC) and TeV-Energy Superconducting Linear Accelerator (TESLA) designs. They also show promise for application to high-energy electron cooling at the TeV energy scale. If successful, this technique could be used to maintain the quality of the beams at the Tevatron for long periods of time.

In early May, Reinhard Brinkmann and Klaus Flöttmann came to Fermilab to participate in measurements, triggered by the promising experimental results that the Fermilab photoinjector group had just obtained. Together with Yaroslav Derbenev, Brinkmann and Flöttmann discovered a new and completely surprising concept for improving the electron beam in an accelerator. They predicted that, without using expensive damping rings, it would be possible to convert a round electron beam to a flat beam with better quality. Experimenters at the Fermilab photoinjector were the first to observe the effect, a major breakthrough.

If physicists achieve the electron beam specifications of a linear collider without having to build a damping ring, "this would save about 100 million dollars, independent of the final accelerator technology [NLC or TESLA] that is eventually used," Brinkmann says. He would like to see the DESY-Fermilab co-operation intensified, especially since there are plenty of research topics, like beam focusing, that need investigation no matter what kind of machine will be built in the future.

Wake Fields and X-rays

Fermilab's photoinjector is presently used for many other experiments related to beam physics. James Rosenzweig, professor at UCLA, and his graduate students are carrying out experiments on beam acceleration using plasma wake fields. Having worked in the field for more than ten years, Rosenzweig is finally harvesting the results of his persistence. Using the high-quality electron beam

of the photoinjector, Rosenzweig's group is able to achieve acceleration gradients of 500 MeV per meter – but presently they are only able to build a plasma device a few millimeters in length.

Fermilab physicist Richard Carrigan is using the photoinjector to create x-ray radiation that is potentially hundreds of times more powerful than that obtained from sources currently used at hospitals. Guiding the high-quality electron beam through a crystal, the intense x-ray radiation is produced by a mechanism called channeling radiation. Carrigan's collaborators at TH Darmstadt, Germany, have probed the possibility that hospitals could build x-ray facilities for heart studies and mammogram screening that could provide much better contrast, without having to rely on very large synchrotron light sources.

Globally expanding connections

At the International Conference on Future Accelerators meeting in October of 1999, Wagner initiated a discussion of what a worldwide collaboration for a future accelerator might look like. Laboratories around the world would not only be involved in the construction but also the operation of such an accelerator. The successful collaborations for particle detectors such as CDF point in the direction one needs to go, he said.

Fermilab director Mike Witherell confirms this point of view: "If there will be only enough funding for one TeV-scale collider, it is important that it will be built as a broadly based global project tied to laboratories around the world. No matter where a linear collider is built, it needs to be a part of the core program for laboratories elsewhere." He credits Wagner with taking a leading role in that effort.

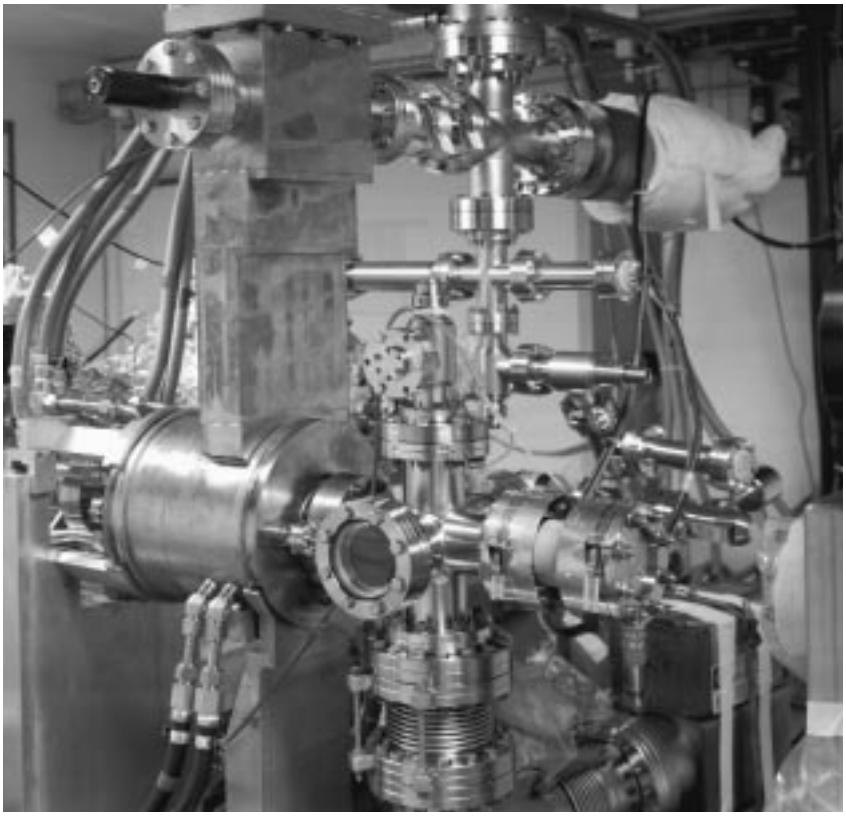


Photo by Reidar Hahn

The RF gun, a sophisticated device, provides a high-quality electron beam.

At a time of reduced budgets for high-energy physics, a single laboratory cannot explore all aspects relevant to a future accelerator. Laboratories need to expand their collaboration efforts. Regarding Fermilab's role, Witherell sees these priorities: "Linear colliders are an issue of intense interest for the worldwide high-energy physics community. It will come to a decision point in the near future, and Fermilab needs to be involved in that decision."

Collaborations like those that have been so effective for DESY and Fermilab in the past will be essential for the future.

Connecting with DESY Zeuthen

Photo by Reidar Hahn

DESY Zeuthen had few connections with Fermilab until last year, when DESY decided to build a photoinjector, the third of its kind, at its Zeuthen location near Berlin. Since then engineers and physicists from Zeuthen have visited Fermilab to learn about its photoinjector and related R&D activities.

Another connection between DESY Zeuthen and Fermilab was established on May 1. Kurt Riesselmann, formerly working as public relations officer at Zeuthen, joined Fermilab's Office of Public Affairs. He already had strong connections with the Midwest: He received his Ph.D. in physics from the University of Wisconsin-Madison, and his wife, Lisa, is from Milwaukee.

New Panes Mark Next Phase of Wilson Hall Rehab

Photos by Reidar Hahn

Water fountains make a big comeback, but the face of Wilson Hall will change dramatically during the next phase of structural repairs continuing into 2001.

The main entrance to the High Rise will be fenced in while the sloping glass panes are replaced on the north side of the building, followed by repairs to the entry plaza known as "the horseshoe." A gate in the construction fence will allow access to the front entrance until work begins on the glass replacement; the gate (and thus, the front entrance) will then be closed until at least December, the anticipated completion date for the reglazing. The fence will remain in place for the entry plaza repairs, scheduled to begin in the spring of 2001, when the sloping glass panes on the south side of the building will also be replaced. The east door on the ground level will serve as the main entrance, and some of the three-hour parking spaces will be redesignated as one-hour parking spaces for short term visits to Wilson Hall.

Meanwhile, enjoy a drink from the shiny new stainless steel water fountains on floors one through six. And watch this space for further updates on Wilson Hall construction from project manager Elaine McCluskey. You can also check out the latest information on the web at: http://fess-wh.fnal.gov/.

— Mike Perricone

PART 2

Elaine McCluskey's Guide To Wilson Hall Construction

Plumbing Near Completion

The project begun last October by subcontractor Masoncorp, Inc., has been completed with new drinking fountains on floors 1-6, a new drinking water filtering system, new piping to the toilet rooms on floors 1-6, and new supply risers for toilet rooms and drinking fountains on floors 1-15. The rest of the plumbing repairs, part of the structural repairs by subcontractor Fred Berglund and Sons, Inc, should be completed later this year. All the work is being done between 6 p.m. and 2 a.m. to minimize the affect on High Rise occupants.

Crossover Corrections

Some unexpected arrangements of reinforcing bars in the concrete caused some delays in the demolition and repair of the 8th floor west crossover joints that began in April, as new reinforcements for the 8th floor crossover beams were developed. Once the 8th floor concrete cured, repairs began to the 9th floor, which is supported by the 8th and 7th floors as well as the shoring tower and trusses. When those repairs are completed in June, work will move to the 10th floor. The trusses and shoring tower will come down, since the repaired 9th and 8th floors will support the 10th floor. Each floor should take four to six weeks; the 13th floor will take a little longer, since it also holds up the 16th floor. The work will also include removing old cables, replacing ceilings, painting, installing new carpet, all conducted between 6 p.m. and 2 a.m.

New Skylights

The atrium will be a brighter place after the next major component of the WH Safety Improvements Project, the WH Glazing Mods, which will replace the north and south sloped windows and the skylight, and refilm the vertical glass on the north and south window walls beginning in June. All this exterior work, a $1.7 million project by R. C. Wegman Construction Co., will be done during daylight. The skylight will be removed and replaced. To keep any inclement weather from entering the building, the subcontractor will only remove as much glass as can be replaced each workday. A wood-and-aluminum work platform with safety railings will be assembled on the atrium floor below the skylight and lifted into place, covering about one-third of the skylight area. It will move along the length of the skylight in the window washing tracks at the 16th floor.

North Window Wall Sloped Glazing

For the second portion of the Wegman subcontract, replacing the large panes of glass in the north window wall, each old plate glass pane will be replaced by three new pieces of laminated safety glass; the three-for-one exchange stems from limits on the manufacturing size of laminated glass. (In a preview earlier this year, an existing pane in the lower east corner of the north windows was divided into three panes as a mock-up.) As with the skylight, only as many panes will be removed as can be replaced in one day. To minimize impact on the atrium, a full-height weather partition made of pipe scaffolding and plywood will be installed inside the north sloped wall. Building this temporary wall should take about a month, beginning in July.

Photo by Reidar Hahn

Fill ‘er up at the new water fountains (opposite page), which also feature faucets. The view will change temporarily as glass panes are replaced (above) on the north side of Wilson Hall.

North Window Wall Vertical Glass Refilming

The north glass at the north crossovers on floors 7 to 15 has old safety film that must be replaced. This work will occur as each crossover is closed for structural repairs, and should not affect building occupants.

South Window Wall Vertical Glass Refilming

The vertical glass in the south window wall between floors 5 and 13 also has safety film that must be replaced. This will be done by hanging scaffold from the 13th floor and will affect mostly those who use the 5 south crossover. A canopy installed over the crossover will permit continued occupation during this work.

Success for CDF's Central Outer Tracker:

Just a Matter of TIME

Cover Photo: The Central Outer Tracker is lowered by crane onto the siege cart for positioning at the center of the massive CDF detector.

by Mike Perricone

One of the great mysteries of science, time is also its unsparing motivator.

Time dictated the function of the new Central Outer Tracker destined for a critical role in the massive CDF detector during Run II of the Tevatron. With proton-antiproton collisions occurring in greater numbers and at a faster rate than ever before at Fermilab, the Central Outer Tracker's design needed to provide chambers that could extract more information from tracing the tracks of particles over smaller intervals of both time and distance.

Once the go-ahead was given in 1996, time relentlessly drove the design and assembly of the Central Outer Tracker, which surrounds the beam pipe at the very heart of CDF's operations with about five times as many information channels as the Central Tracking Chamber it replaces—some 30,000 channels, in 2,500 separate cells, compared to 6,000 channels in the now-superseded Central Tracking Chamber.

"We were very conscious that we had a very limited amount of time for a project with this level of complication," said CDF co-spokesperson Franco Bedeschi. "A lot of new engineering and technology went into the design of the chamber."

When the setbacks came—primarily from endplates that were inaccurately machined, and arrived late—time drove the project managers to new levels of endurance.

"The whole team that was working on this started working 24 hours a day," said CDF co-spokesperson Al Goshaw. "We needed physicists as shift supervisors from all the COT's collaborating institutions to cover the 24-hour operation. It took the dedicated efforts of many people to assemble the chamber: technicians, physicists, engineers and designers.

"And one or the other of the two project leaders were just there all the time," Goshaw continued. "Any time you'd go over there, day or night, one of them was there, if not both of them."

On Thursday, May 11, project leaders Aseet Mukherjee and Bob Wagner had the Central Outer Tracker taken out of their hands. Temporarily.

The "can," as it's dubbed, an aluminum cylinder 10 feet in diameter and 10 feet in length, was lifted by crane off the supports where it had been

The Central Outer Tracker is loaded onto a special low-riding, air-suspensioned flatbed truck from its assembly site in Industrial Center Building 4 (left), covered to protect it from the elements (center), and wheeled outside to prepare for its journey across D Road to the CDF Assembly Hall (right).

assembled in Industrial Center Building 4. The supports were placed on the back of a special low-riding, air-suspensioned flatbed truck. The tracker was then lowered on the supports, secured, covered, and sent off for its painstaking drive through wind and rain, across the road to the CDF Assembly Building. The journey, a quarter of a mile at best, took a half-hour—a speed of something like two hours per mile.

"I'd say the truck was moving at about the rate of a slow walk," estimated Mukherjee, "but it wasn't very far and there was no rush. We were less worried about the rain than we were about the wind. If the can blew over, obviously that would be bad. If the cover blew off, that wouldn't be so bad in itself, but it could snag on something and do some damage as it came off."

But neither wind nor rain delayed the Central Outer Tracker, which was lifted off the truck and successfully inserted into the CDF detector, with two millimeters of clearance. The COT sits in the center of the CDF structure, just outside the silicon detectors that provide the closest contact with the particle collisions. There, said Bedeschi, the COT represents "a key detector to make high-quality physics measurements at CDF for Run II."

Internal Competition

Now there's a breather for Wagner and Mukherjee. Temporarily. But they couldn't keep themselves away from seeing how things were going in "the pit," as the COT settled into place in the big detector.

The Central Outer Tracker grew from an internal competition within the CDF collaboration, complete with several different proposals examined by internal review committees, during what Goshaw described as "a very stressful time." Initially, another design was chosen; but when that design appeared as if it couldn't be completed in time, the strategy switched to adapting the original CTC and using it in Run II until the original choice was completed. But that would have meant replacing all the original electronics in the CTC to meet the new Run II requirements—with a temporary detector. It would be costly, and time was moving on.

A Modular Idea

Meanwhile, Mukherjee and Wagner had been working on a "modular" concept. Instead of individually installing, tensioning and testing the thousands of wires used to record the flight of the particles following the collisions, why not create subassemblies where whole sections of the wires could be constructed at once and shipped off for testing before they were installed?

"Mainly, we just wanted to have something we could load very quickly, because it was clear the schedule would be very tight," Mukherjee recalled. "The question was how get a large number wires installed in a short period of time—and the idea was to overlap most of the wire work before the 'can' was actually completed."

The solution, modular drift cells, were made up of pre-made wire planes and field (or cathode)

The truck trip took about half an hour (left), with the COT mounted on the same stand used for assembly in IB4. Project co-leader Aseet Mukherjee explained that the wheeled support would allow the "can" to roll in accommodating any flexing by the truck bed. The COT was then lifted by crane (right) into the CDF Assembly Hall.

Just a Matter of TIME

planes. The wire planes consisted of 29 wires each, 12 recording the flight of the particles, and the rest shaping the drift trajectories. The field plane is made of very thin Mylar (a strong polyester film widely used in insulation, and in capacitors as the dielectric material) with a vaporized gold coating. The wire planes and field planes are attached to precision-machined aluminum end plates that bear 60 metric tons (100,000 pounds) of total tension. The wire planes were made at Fermilab's Lab 6 by Karen Kephart's group in Technical Centers and tested at the University of Illinois. The field planes were made at Harvard University and Lawrence Berkeley National Laboratory.

The wire planes and field planes were positioned in slots machined into the end plates. The slots were made quite narrow, to maximize the plate strength, and to minimize the shape-altering effects of the tension. But there were delays and inaccuracies in the machining, and some of the slots' positions did not fall within the specified tolerance.

The solution: matching individual wire planes with individual slots with the aid of a computer.

Capitalizing on Oddballs

"There was a natural scatter within a range we expected to see, with the wire planes, plus a few oddballs which we felt we wouldn't use at all," Mukherjee said. "But the endplate wasn't machined very accurately. So the ideal solution was to take advantage of the natural spread plus those few mistakes that were made in wire planes, to compensate for errors in the end plate. We tried to eliminate the difference between the end plates. Basically, the wire planes are in the wrong position, but they're off by the same amount on both sides."

Added Wagner: "Each slot was measured on a coordinate measuring machine, so we knew the locations and features of all of them. We measured each wire plane in a similar manner, and used a computer to match them up with the best accuracy. We were able to correct a lot of problems in the machining. Of course, if everything had been perfect, we would have had a lot less to keep track of."

Not to mention needing less time. Installing the wire planes took more than four months, followed by quality control efforts to make sure the detector could stand up to 10 years or more of operation. That meant months of round-the-clock shift work: day and evening shifts with two crews of two people each, installing the planes, and an owl shift to carry out quality control checks.

Once the wires were all in and the can was sealed up, the big test was next: filling the chambers with gas and seeing if all the wires could hold 2,500 volts of electricity.

"It was astounding," said Goshaw, "because it was clear that everything was coming up to high voltage very smoothly. It was an absolutely incredible technical feat to go through all those problems and then have 30,000 wires smoothly coming up to high voltage.

The COT is lowered into position on the siege cart (left). Mukherjee likens the siege cart (center) to a "battering ram," but its job is to coax the COT into the center of the big CDF detector (right). Technicians stationed inside the big detector (below) guided the COT into position with only two millimeters of radial clearance. They were able to make adjustments in both the siege cart and the "H-frame" to avoid contact.

"Bob and Aseet are the people who really carried out this project," Goshaw continued. "They suffered many frustrations along the way but they persisted. They knew what was right, they carried it though to this point, and now they'll be responsible for bringing the COT up to operation."

Making Connections

The next commissioning step is to get all the electronic connections into place—another painstaking task, with 30,000 channels to connect. The next deadline is August, when the end plugs of the detector will be put in place, and the innermost electronics will be out of reach.

The electronics will soon be busy with the first data run—the first proton-antiproton collisions during the commissioning run from late August to October. The COT will be critical to tuning the whole detector, and preparing to take good physics data right from the start of Run II of the Tevatron in March, 2001. Wagner, Mukherjee and all the dedicated crews who have worked on the COT are waiting to watch it turn on and light up.

"Well, we hope it doesn't exactly light up," Mukherjee said. "What we hope is to take it quietly and smoothly so nobody notices anything until they look at it when it's up and running."

Time will tell if he's right.

Photos by Reidar Hahn

LETTER TO THE EDITOR

To *FERMINEWS*:

A recent story in *FERMINEWS* ("Feedback," Vol. 23, No. 4, February 25, 2000) includes a statement from management that alternative work weeks for the laboratory would not be implemented because management "thought such schedules would not be fair." However, a memo was circulated about the same time (dated February 23, 2000) from Associate Director for Administration Bruce Chrisman, codifying the policies governing telecommuting. Telecommuting suffers from the same problem as alternative work weeks, as I would guess that even fewer members of the laboratory could partake in a telecommuting program than an alternative work week due to the nature of their work. How does one reconcile these two seemingly opposing positions?

Thanks,
Tom Ackenhusen

Bruce Chrisman

Dear Tom:

We believe that these two positions really aren't in opposition. We enacted a telecommuting policy at the same time as a policy covering arrangements for certain employees, particularly scientists and other professionals, who routinely continue their work in the evening after their regularly scheduled day, or otherwise add to their work time. They are able to use a computer connection from their home, which is provided by the lab. The telecommuting policy also allows some people to avoid coming back to the lab on off-hour call-ins. Since telecommuting, call-in avoidance and additional work-hour situations are so similar, we decided to combine them into one policy package.

A successful telecommuting arrangement requires the specific skills and the sort of job description outlined above. We do not expect very many situations where both the natures of the work and skills come together to make telecommuting a widespread option. Since not all work can be performed with a computer and a telephone, many entire job categories are ruled out from consideration.

Most individual positions could be eligible for alternate work schedules, when considered by themselves. However, they must be judged in the context of required interactions with other workers or groups. Those necessary interactions would be the determining factors, and we might have to decide against a request for an alternate schedule based on the requirements in this larger context.

Sincerely,
Bruce Chrisman
Associate Director for Administration

Symposium on Fixed-Target Program with the Tevatron

January 2000 marked the end of a successful era of fixed-target experiments using the Tevatron's proton beam.

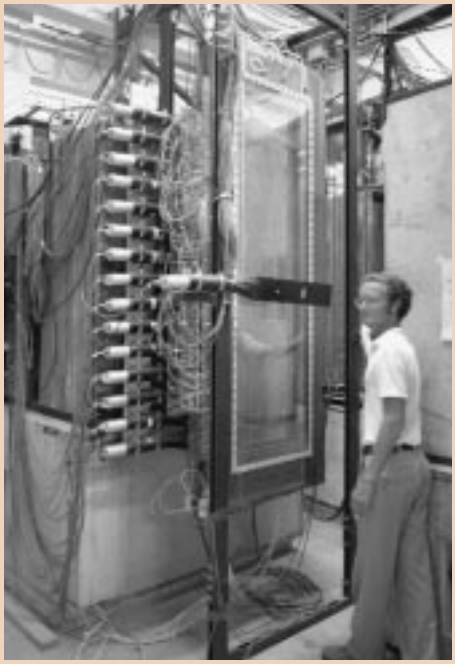
Over 17 years physicists carried out a total of 43 experiments. Their scientific results are documented in 360 publications in refereed journals. More than 380 doctoral and 80 master's degrees have been awarded to students who worked on the experiments. And more are to come as the final data are being analyzed.

In celebration of the physics, the technology, and the people who were a part of the program a one-day Symposium will be held on Friday, June 2, 2000 from 9:00 a.m. to 4:00 p.m. at Fermilab's Ramsey Auditorium.

Speakers, including Leon Lederman, John Peoples and several prominent physicists from the user community, will review the highlights of the fixed-target era. The last talk of the day, given by Fermilab's director Mike Witherell, will focus on the prospects of a future fixed-target program at lower energies using the new Main Injector.

Participants should register on-line at http://conferences.fnal.gov/tevft. There is no fee. Registered attendants will be given a free copy of the fixed-target commemorative book.

The Symposium will end with a party in the Wilson Hall Atrium. All Fermilab employees are invited to join the celebration.



Current Fermilab Director Michael Witherell with experiment E691 in 1979.

CALENDAR

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

INTERNATIONAL FILM SOCIETY Presents

Friday June 16, 8 p.m. Ramsey Auditorium Wilson Hall *Smiles of a Summer Night (Sommarnattens Leende)* Dir: Ingmar Bergman, Sweden (1955) 108 min.

A brilliant romantic comedy, starring Ulla Jacobsson, revolves around the sexual liaisons and moral dilemmas of eight sophisticated people vacationing at a country estate in the late 1800s.

For more information call 630-840-8000.

ART SERIES Presents:

Saturday June 3, 2000 $19 Ramsey Auditorium Wilson Hall The Four Bitchin' Babes, Sally Fingerett, Megon McDonough, Debbi Smith and Camille West. Together they tell humorously observant tales of modern urban life.

For more information call 630-840-ARTS.

FERMILAB LECTURE SERIES Presents:

June 9, Dr. Judah Folkman, Harvard University will discuss angiogenesis and cancer research.

Tickets are $5 Ramsey Auditorium at 8 p.m.

For more information call 630-840-ARTS.

ONGOING

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

■ NALWO coffee for newcomers & visitors every Thursday at the Users' Center, 10:30-12, children welcome. In the auditorium, International folk dancing, Thursday, 7:30-10 p.m., call Mady, (630) 584-0825;

BARN DANCES

Sunday, June 11 Barn dance in the Kuhn Village Barn from 7 to 10 p.m. Music by the Cook County Revelers with calling by Paul Watkins.

All dances are taught and people of all ages and experience levels are welcome. Admission is $5, children under 12 are free (12-18 $2). The barn dance is sponsored by the Fermilab Folk Club.

For more info, contact Lynn Garren, x2061, garren@fnal.gov or Dave Harding, x2971, harding@fnal.gov.

MILESTONE

BORN

Emma Nicole Pavnica on May 7th to Tom and Amy (ES&H Section/CD) Pavnica. Emma weighed 8 lbs., 13 oz., and is 18-1/2″ long. She was also welcomed home by her big sister Anna.

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, May 31

Coriander Chicken with Tortillas
Salad of Pickled Vegetables
Cinnamon Rice Pudding

DINNER
Thursday, June 1

Booked

LUNCH
Wednesday, June 7

Seafood Salad
Blueberry Turnovers with Ice Cream

DINNER
Thursday, June 8

Booked

LUNCH
Wednesday, June 14

Tortellini Vegetable Salad
Fruit Tarts

DINNER
Thursday, June 15

Fish Terrine
Grilled Veal Chops with Tomato Basil Salsa
Barley, Corn and Peppers
Chocolate Almond Torte

LUNCH
Wednesday, June 21

Thai Beef Salad
Chocolate Pecan Cake

DINNER
Thursday, June 22

Eggplant Fans
Monkfish Tails en Piperade
Saffron Rice
Field Greens with Blue Cheese Dressing
Grand Marnier Souffle

FERMINEWS

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The deadline for the Friday, June 16, 2000, issue is Tuesday, June 6, 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

■ '99 Harley Davidson Sportster Custom XL883C (Black) 3,000 miles has a windshield, forward controls, saddle bag brackets and a touring seat. Asking $7,500 contact Terry X4572 skweres@fnal.gov or Janine at none2compare@yahoo.com.

■ '99 Goldwing SE (Silver) with extras. Price dropped to $14,500—lower than new and the extras still go with it. 11K miles - excellent condition and runs great. Still has 2 yrs on original as of Nov. 5 (unlimited miles) warranty. Can get another 3 yrs extended (Unlimited Miles). Call Terry X4572 or e-mail skweres@fnal.gov

■ '88 Plymouth Sundance 4-Door hatchback excellent condition. 105,000 miles. New brakes, battery and radiator. $2,500 obo x8295, x3604 428-0024 (evenings).

■ Power boat, 20 foot, 1994 Ski Nautique, mint condition, 267 hours, 5.8 PCM Pro Boss engine, 240 horsepower, depth gauge, AM/FM/CD player, Bimini top, Wake Board Pylon with Fly-hi board rack, trailer and travel cover included, $19,000. Call Ted at (630) 377-5857

■ Lawn mower, 5hp, 22″ cut, self propelled, 2 years old. Side or rear discharge, or mulcher. "Weedeater" brand. $130 call Ed Dijak X6300 or e-mail, dijak@fnal.gov

■ Nordic Track Machine $150. King size waterbed frame $40. Toddler bed new mattress $20. Futon frame (wood) $50. Snow ski's 3 sets assorted sizes and bindings and poles all for $30. Call Terry X4572 or e-mail skweres@fnal.gov.

■ Entertainment Center, light oak. 65″x23″x52″ tall 27″ T.V. or bigger. Two glass drawers with 3 shelves and 3 drawers plus storage area. $150 obo. Bunk beds with 2″ tubular steel, twin on top and full mattress on the bottom, 2 years old. $125 obo. (630) 964-23115

BIBLE STUDY

■ The 12 o'clock (noon) Bible Study group meets Wednesdays in the Huddle located in the cross gallery. Contact Jeff Ruffin x4432, or ruffin@fnal.gov .

FOR RENT

■ Apartment, 2BR, DR, Kit, Bath, LR, basement washer/dryer, garage, central air, non smoking. Batavia. $750/month. Available immediately. markl@fnal.gov, (847) 202-9209.

■ 10 minutes from Fermilab. Newly remodeled 1 and 2 bedroom apartments available, $550 to $750 /month. Carl (630) 892-5257.

MISCELLANEOUS

■ Baby-sitting needed for my 6-year-old during summer. Ideal for high schooler or college girl. Time: M-F 9:30 am to 6pm (afternoons at the Fermilab pool). Pay: $40/day, weeks from June 5 to July 21. Must have use of a car. (630) 840-2574 or 983-3575 (eve)

■ Don "Rap" Rapovich of FESS & Joanie Miller of Business Services are to be married during the Illinois State Harley Owner's Group Rally in Springfield, Ill. The wedding will take place at Lincoln's Tomb on Saturday May 27th at 10:05 AM. Official permission has been granted for this first time wedding event at this historic site.

LOS ALAMOS RELIEF FUNDS

Energy Secretary Bill Richardson has established The Northern New Mexico Fire Recovery Fund, which is authorized to accept gifts from all public and private sources to aid victims of the fires that ravaged the area around Los Alamos National Laboratory. Donations, which are tax deductible, can be sent to U.S. Department of Energy, Attn: Northern New Mexico Fire Recovery Fund, PO Box 500, Germantown, MD 20874-0500.

Checks should be made payable to the Department of Energy and indicate they are for the Fire Recovery Fund.

The University of California along with Los Alamos National Laboratory has also established a relief fund to assist all area residents affected by the Cerro Grande fire. Contributions should be directed to the Los Alamos National Bank, PO Box 60, Los Alamos, NM 87544. Checks should be made payable to the UC Northern New Mexico Fire Relief Fund and specify account number 96358501. For more information please go to http://labs.ucop.edu

About one third of the physicists participating in Fermilab's MiniBooNE experiment are employed by Los Alamos Laboratory. Many own or rent property in the Los Alamos area.

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