

FERMILAB NEWS

 Fermi National Accelerator Laboratory

Operated by Universities Research Association Inc.
Under Contract with the United States Department of Energy

Vol. 2, No. 12

March 22, 1979

CHICAGO CYCLOTRON REBORN YET AGAIN

The people in the Neutrino Area have an admirable respect for the University of Chicago synchrocyclotron that has been serving for more than seven years as a particle spectrometer in the Muon Laboratory.

"In its earlier life, it had provided the 450 MeV proton beams for many important experiments of Enrico Fermi, his collaborators and many other scientists," said Joseph R. Heim, project engineer. "It has always seemed fitting that the cyclotron magnet should have a useful role at Fermilab."

Indeed it has. And now, it is undergoing another reincarnation.

The large analyzing magnet--some 170 inches in diameter--is being modernized with superconducting coils. The replacement coils are being wound in the Meson Detector Building. More than 20 miles of superconducting cable will be used to wind the upper and lower coil assemblies.

The modernization will not change the magnet's field, but it will allow Fermilab to generate the field at considerably lower cost than in the past.

In September 1978, the Greater Chicago Committee to Use Energy Wisely honored Fermilab for this conversion with its Special Recognition Award. The award was presented "for the wise management of their energy resources." Hank Hinterberger, associate director of the laboratory, accepted the award from Chicago Mayor Michael Bilandic.

In addition to Hinterberger and Heim, others who are spearheading the modernization are Bob Kephart, who is in charge



...The famous University of Chicago synchrocyclotron has been serving Fermilab researchers for more than seven years. Visiting site are, L-R, Jim Michelassi, Bob Kephart, Ed Tilles and Joe Heim - (also see photo on page 2)...

of superconducting analysis magnets on the site; Jim Michelassi, assistant project engineer; and Ed Tilles, operations specialist in charge of construction.

The conversion is being financed with a grant from the U. S. Department of Energy as part of Fermilab's continuing search for ways to conserve energy.

* * * * *

URA ANNUAL REPORT OPTIMISTIC

The 1978 annual report of the Universities Research Association recalls the past year with pride over Fermilab's accomplishments and looks ahead with a spirit of optimism.

"The coming year should be a busy but productive one under the new laboratory director," writes Dr. Norman F. Ramsey in the report. "The greatest effort will go toward using the existing accelerator for basic particle physics research. A major activity will be the development and construction of the Tevatron and preparations for research at the higher energy provided by the Tevatron."

Ramsey, Higgins professor of physics at Harvard University, stepped down earlier this year as president of URA. He concludes the annual report by saying, "The coming year should provide exciting scientific discoveries."

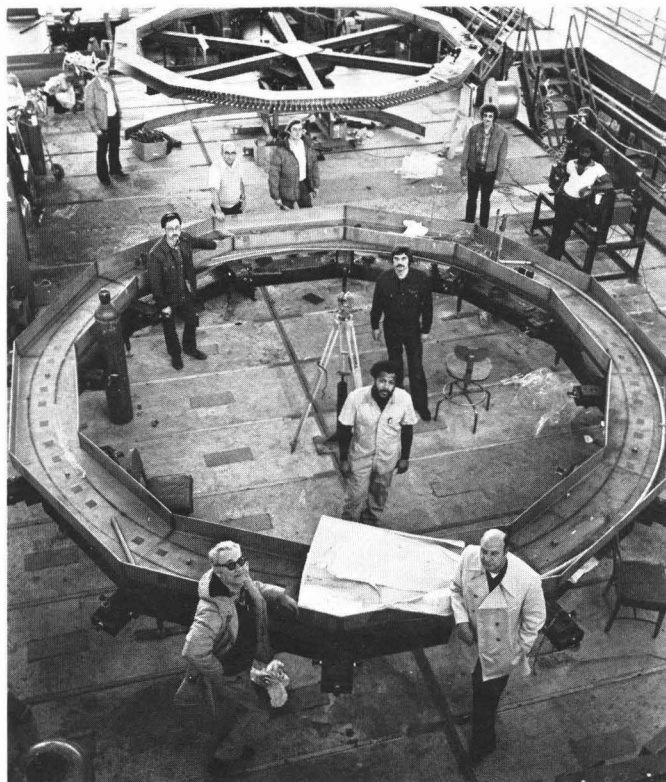
In assessing the accomplishments in 1978, the report says, "Three records were set near the end of the year: 148 hours of high energy physics in a week; 1.35×10^{18} protons accelerated in a week; and, a record beam intensity of 2.60×10^{13} protons per pulse."

The report also says, "A new Colliding Beams Facility Department in the Research Division has been developing plans for a detector that could be used in the future colliding beam program at Fermilab. A definite design proposal for this detector has now been formulated."

And in the matter of health care, the report says about the Cancer Therapy Facility: "Experience in its first two years of operation, involving the treatment of some 300 patients, has produced two important results. First, almost without exception, all relatively large radioresistant tumors have responded to the neutron beam. Second, within the two-year observation period, no unexpected late side effects have been encountered."

The report says the biggest problem facing Fermilab is its meager level of funding. "The mismatch between available funds and the needs of the Fermilab program will no doubt continue to be the most serious problem during the coming year and will probably lead to painful delays and lost scientific opportunities."

The report also says, "As of last year, the approval of new proposals was dominantly limited by the financial ability of the



...Chicago cyclotron's upper cryostatic coil assembly in the background, already wound and welded shut. Lower assembly in the foreground is waiting to be wound. Photograph taken in the Meson Detector Building. Clockwise, outside lower assembly are John Rauch, Ed Tilles, Bob Kephart, Steve Dochwat, Clarence Rodgers, Joe Heim and Jim Michelassi. Clockwise inside the lower assembly are Richard Applegate, Gary Wisniewski and Chet Shaw...

Laboratory to support the research. The low acceptance rate creates a severe problem for a university which may have an excellent particle physics research staff but too few approved experiments."

Experimental research reviewed in the report included the upsilon and dimuon production, charm and neutrino interactions, direct lepton production, muon scattering, jets, kaon form factors and magnetic moment of lambda. Other topics include the accelerator, the meson, neutrino and proton experimental facilities, the tevatron, colliding beams and computers.

The report also praised the User's Organization and its Executive Committee for their "valuable advice both to Fermilab and the URA."

Copies of the report are available in the library, CL-3S, or in the Public Information Office, CL-1W.

SIGMA XI SPEAKER URGES NEW APPROACH TO PROBLEM SOLVING

If Dr. Simon Ostrach had his way, he'd climb on a soap box and preach a mathematical methodology that, he says, would help many problem solvers in the physical, health and social sciences solve their problems.

The Wilbert J. Austin distinguished professor of engineering at Case Western Reserve University enthusiastically exhorted the theorists, engineers and researchers in his audience to re-evaluate the mathematical approaches to their experimental designs and to be careful what terms they throw away in the formulas that might hold the answers. Sometimes they discard the very term that has the most influence on the results of the experiment, he said, supporting his argument with a number of down-to-earth examples.

Speaking in the Central Laboratory auditorium as the guest of Sigma Xi, the confident Ostrach said his mathematical approach is applicable across the spectrum of the physical, health and social sciences. Basically, he advocates redesigning the mathema-

tics with a technique that involves normalization and dimensionless parameters. This approach considerably simplifies the mathematics and helps the scientist see more clearly the relationship various parameters in the equations have to one another, he said.

Ostrach's approach is basically a deductive analysis, which he says is superior to the inductive analyses that now dominate scientific thinking and too frequently lead to wrong answers and shocking misinterpretations of data. In effect, the Ostrach design "will tell you if you are going in the wrong direction," he said. "It's a powerful tool."

Dr. Marvin E. Johnson of Fermilab's Research Services and president of the Sigma Xi chapter introduced Dr. Ostrach and moderated a question and answer session after the lecture.

* * * * *

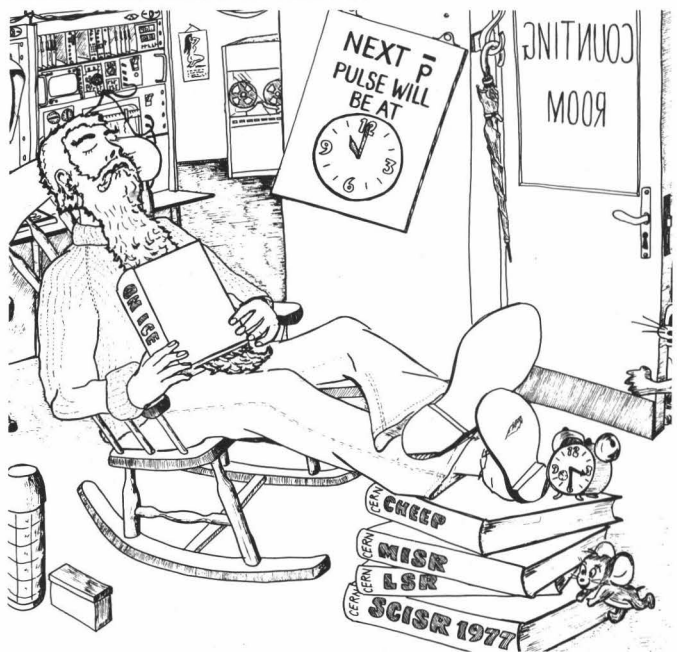
CERN ACCELERATOR REACHES 500 GeV

The March 1979 issue of the Cern Courier carried a report of a recent performance record last December at CERN. A portion of that report says:

"After the physics run, a machine development period was used to test the energy abilities of the machine. Here the aim is to establish reliable operation at 450 GeV which is scheduled to begin in June. The installation of a third 90 MVA transformer makes these energies possible. On Dec. 19, 450 GeV was quickly reached when problems with the electricity supply were cleared. On Dec. 20, the 450 GeV cycle was repeated, followed by 475 GeV.

"The first attempts at 500 GeV were thwarted at 491 GeV due to radial displacement of the beam because of increased saturation of the magnets causing a distortion of the closed orbit in the region of the radial r.f. pick up. A minor change in radial beam position brought 500 GeV and the machine ticked over for an hour accelerating protons to this energy. The SPS thus joins the Fermilab accelerator as the highest proton synchrotron in the world."

* * * * *



..."For the proposed scheme to collide protons and antiprotons in the CERN intersecting storage rings (ISR), it will take 24 hours of dedicated time on the 28 GeV proton synchrotron to produce just one pulse of circulating antiprotons in the ISR. This motivated Phil Bryant of the ISR Division to produce his own interpretation of the control room"...

CERN COURIER, March 1979



...Soul food queen Mrs. Symira Brown of Batavia beams over the menu she cooked for hungry Fermilab employees, users and visitors in the Fermilab cafeteria recently. The menu consisted of cole slaw, greens, blackeyed peas, chitterlings, barbequed ribs, corn bread and sweet potato pie...

BILLIARDS EXHIBITION

GENE PLANT, 1979 site champion
versus
RICK COLEMAN, 1978 site champion

Tuesday, March 27
5:30 p.m.

Users Center in the Village

FREE AND OPEN TO THE PUBLIC

DENTAL PLAN REMINDER FOR FERMILAB EMPLOYEES

Fermilab's dental plan becomes effective Sunday, April 1. Through the plan, an employee will be covered and his or her family may be covered if the employee chooses. It is most important that each employee remember to fill out a registration card and return it to the Benefits Office. Unless the card is on file with the insurance company, a person cannot collect on claims. For additional information, contact the Benefits Office, CL-6E, Ext. 3395.

INDIAN SCULPTURE LECTURE

The sculpture from the Gupta Period in India, known as the Golden Age, will be the subject of a lecture by Dr. Jack V. Sewell, curator of Oriental Art at the Art Institute of Chicago, March 30.

Free and open to the public, it will begin at 8:30 p.m. in the Fermilab Auditorium. His talk, "The Ideal Image: The Gupta Sculptural Tradition of India and its Influences," ties in with the new exhibit at the Institute.

Reservations for the talk may be made any time through the Guest Office, Ext. 3124.

* * * * *

GENE PLANT REGAINS SITE CHAMPIONSHIP

Calling himself "the old man of the high rise," Gene Plant will retire truly a champion.

Central Laboratory manager, Plant regained the site pocket billiard championship for 1979 to realize his ambition to "retire being the site champion." He will retire April 30.

Plant, who was 1977 champion, but did not compete in the 1978 competition, defeated David L. Opitz of the Accelerator Division's Electrical and Electronics Group 100 to 50 points in a straight pool game known in the trade as 14-1. Playing with the form that earned him many championships and recognition, Plant did not lose a game during the tournament.