

Electron Cooling Earns I-R 100 Award



Peter McIntyre examines a data book. Behind him is the electron beam system. Cooling of the proton beam is accomplished along the horizontal segment.

Fermilab's impressive electron cooling system has earned for the Laboratory one of the distinguished I-R 100 Awards.

It is the second year in a row that the Laboratory has been honored. Last year it was the negative hydrogen ion source that won for the Laboratory its first I-R 100 Award (FERMINews, Oct. 30, 1980). Each year Industrial Research and Development, a trade publication, selects the year's 100 outstanding new technical achievements-- those that represent significant advances-- and honors the scientists, engineers and the companies for their accomplishments. The awards banquet will be held tonight (Sept.24)

in the Great Hall of the Museum of Science and Industry at Chicago. World attention is generated by the I-R 100 Awards as people in many countries learn about the honors through radio and television stations, trade journals and hundreds of newspapers.

The Laboratory first learned about its honor when Robert R. Jones, editor of Industrial Research and Development and I-R 100 chairman, wrote a letter to Leon Lederman, Fermilab director. In it, he congratulated Lederman and the Laboratory for their outstanding work and informed him that Fermilab was a recipient of one

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I-R 100 HONORS FERMILAB'S ELECTRON COOLING SYSTEM

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of the awards.

Electron cooling along with stochastic cooling are two important systems physicists at Fermilab have been working on. Cooling prepares a beam of antiprotons for eventual collisions with protons. When protons collide head-on with antiprotons at center-of-mass energies approaching two trillion electron volts, scientists expect to learn much more about the makeup of matter than they have been able to in the past.

Cooling a beam of antiprotons is only a part of the magnificent step forward the Laboratory is taking in building a superconducting accelerator that will push high energy physics research near the one trillion electron volt region, high enough to force recalcitrant subatomic particles to yield many more of their tightly-held secrets.

Electron and stochastic cooling research and development at Fermilab have been a colossal team effort involving many physicists, engineers and technicians from Fermilab, as well as scientists and their supporting staffs from a number of universities and other laboratories. One of the principal investigators has been physicist Peter McIntyre. He holds a joint appointment with Fermilab and Texas A & M University at College Station.

In cooling a beam of antiprotons, the scientists reduce the divergence and the energy spread of the individual antiprotons so that the beam is better behaved and more antiprotons can be packed into a storage ring before they are sent on their mission to collide with protons.

In electron cooling (as opposed to stochastic cooling, which is a different technology), scientists superimpose a beam of electrons onto the antiproton beam. The electrons tame (cool) the antiprotons through Coulomb collisions, then the electron beam is removed leaving the cooled antiproton beam. (This may be thought of as dropping ice cubes into warm water, waiting for the water to cool, then removing the ice cubes.)

"The Fermilab electron cooling system was designed to cool a 200 million electron volt beam," explained McIntyre. "Our cooling experiments began in October 1980, and the first cooling of a 115 MeV beam of protons was observed Oct. 17. The beam was cooled by a factor of five in transverse size (divergence) and by a factor of 50 in energy spread in about five seconds. Of course, we were all elated. It took many years of hard work to reach this point."

McIntyre went on to say, "In developing the electron beam for the Fermilab system, we discovered a new mechanism for beam collection and energy recovery. The results give performance far superior to that of any previous design.

"The efficient collection of intense electron beams has several other promising applications. For free-electron laser development, direct current beams of several million electron volts and several amperes will now be possible. For high power radiofrequency sources, energy recovery will likely result in considerably higher output power."

PERMANENT LIFE INSURANCE AGAIN OFFERED

An open enrollment week for supplementary whole life insurance coverage through Corporate Benefit Systems Inc. is being offered.

This insurance is available for employees, their spouses and children. The premium is paid for by the employee. CBS was here last year to initiate the program which is completely voluntary. Premiums can be paid through the convenience of payroll deduction. To qualify, you must be employed for six months or longer, be actively at work and your dependents must not be hospital confined at the time of enrollment.

Employees who were not eligible during the enrollment period last year will be

contacted individually by letter. Any other employee who is interested in talking with a representative of CBS should contact Ralph Wagner of the Benefits Office, ext. 4361.

The plan provides permanent life insurance protection at competitive rates and includes cash and paid-up value provisions. Plan benefits can never be decreased and policies can never be cancelled by the insurance company. Additionally, you may keep the plan or plans on the same rate basis should you retire or end your employment.

Enrollment interviews will be held during the week of Sept. 28.

FERMILAB INDUSTRIAL AFFILIATES' EXHIBITS REVEAL IMPRESSIVE TECHNOLOGY

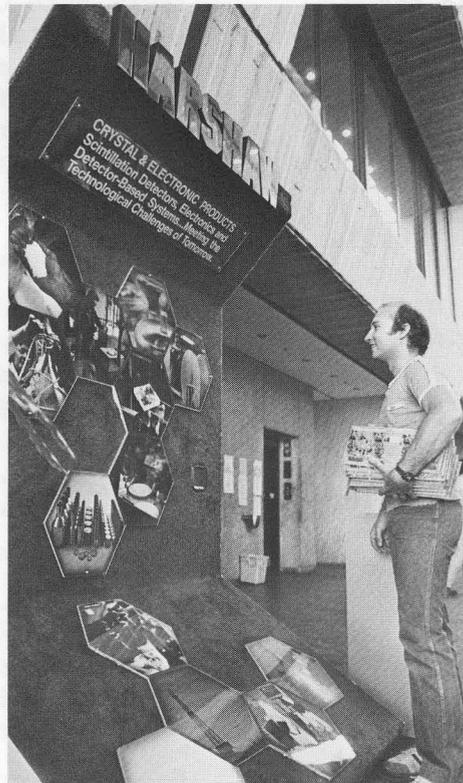


Leon Lederman (far left), Fermilab director, welcomes Fermilab scientists as well as representatives from firms that are members of the Industrial Affiliates. They had gathered at Wilson Hall to meet one another and talk about

their common technologies. The men and women are surrounded by exhibits that show some of the products and construction achievements of FIA members. The exhibits will remain through the end of September.



Intent on learning more about Bell's electronic switching systems, two young men study the exhibit in Wilson's Hall atrium.



Another exhibit, this one by FIA member Harshaw, tells about its achievements and products. The hexagons light sequentially and are accompanied by stereo sound.



A woman studies New England Nuclear's exhibit about "National Laboratory Technology and Nuclear Medicine." Under the dome is a unique magnet.

SIR JOHN ADAMS TO SPEAK HERE

Sir John Bertram Adams, former director-general of CERN (European Organization for Nuclear Research) will give a special lecture at Fermilab Sept. 29.

His talk on *The Origins of CERN and the Future of High Energy Particle Physics* will begin at 3 p.m. in Curia II. Leon Lederman, Fermilab director, will be his host.

Adams has been honored throughout the world for his leadership and accomplishments in high energy physics. When the University of Milan awarded him a Doctorate Honoris Causa, it described him as "originator and devoted constructor of powerful accelerators which have made fundamental discoveries in elementary particle physics possible, in the framework of collaborations of which he has always been a strong advocate."

He also has been honored with the Rontgen Prize from the University of Giessen and the Duddel Medal from the Physical Society of London. Throughout his distinguished career, Adams has held prominent positions. He has been director of the Culham Laboratory, Oxford, and controller of the Ministry of Technology. Adams also has been a member of the Council for Scientific Policy and the Advisory Council on Technology.

In addition to high energy physics, his research interests include plasma physics and thermonuclear reactions.

HMO TO PRESENT DISCUSSIONS

On Sept. 25, Intergroup, our Health Maintenance Organization, will present two group discussions in Wilson Hall auditorium. One will be at 10 a.m. and the other at 2 p.m.

At these meetings, employees will be briefed on the HMO concept of medical insurance and informed about the open enrollment procedures. If you are interested in joining the HMO or want further information, please plan to attend one of these sessions.

Beginning that same day (Sept. 25) and ending Oct. 1, Intergroup will have an open enrollment period. During this week, any employee who wishes to enroll in Intergroup will be able to do so. At the same time, those employees who are currently enrolled in the HMO will be able to drop out of Intergroup if they wish and enroll in our group medical indemnity plan through Connecticut General Life Insurance Company.

FERMILAB USERS ORGANIZATION CALLS SPECIAL MEETING

The Fermilab Users Organization will hold a "Physics Town Meeting" Oct. 2 to discuss this country's high energy physics priorities for fiscal year 1982 and for this decade. The meeting will begin at 1:30 p.m. in Wilson Hall auditorium. The Fermilab Users Organization has indicated that the town meeting is open to anyone who is interested in high energy physics.

NEXT COLLOQUIUM SPEAKER

Bill Walsh of the Argonne National Laboratory will be the Physics Colloquium speaker Sept. 30.

His talk on "Violent Crime and Chemical Imbalances" will begin at 4 p.m. in Wilson Hall auditorium. Irwin Gaines, a member of the Physics Colloquium Committee, will be his host.

RUNNER'S CLINIC DIRECTOR TO SPEAK

Tom McPoil, director of the Runners Clinic at the Newsome Physical Therapy and Sports Medicine Center, Joliet, will speak here Oct. 1.

His talk at 11:30 a.m. in Curia II is open to everyone. McPoil plans to cover a variety of topics about running and will answer questions following his talk. His program is sponsored by the Fermilab Running Club.

CHEZ LEON MENUS

Sept. 30, 12:30 p.m., \$6--A Mexican meal prepared by Maria Dolores Huerta: Agua de Tamarindo (Tamaran Water), Consume de Pollo (Chicken Soup), Comida a la Tampiquena (Combination Plate), Ensalada de Aguacate (Avocado Salad), Flan de Queso (Cheese Custard).

Oct. 1--(Restaurant is fully reserved.)

Oct. 2, 7 p.m., \$11--Baked Mushroom and Spinach Soup, Fermi Chef Salad, Steak and Crab Legs, Duchess Potatoes, Fresh Broccoli Au Gratin, Raspberry Sherbet.

For reservations, call ext. 3082.

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