

FERMILAB NEWS

 Fermi National Accelerator Laboratory

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

Vol. 2, No. 27

July 5, 1979

SCIENCE WRITERS TOUR FERMILAB, HEAR LEDERMAN AND QUIGG TALK ABOUT PHYSICS

Leon Lederman, Fermilab director, told members of the Chicago chapter of the National Association of Science Writers at their recent meeting here that basic research frequently is the breeding ground for advances in technology that eventually benefit society in unimagined ways.

In delivering the principal address following a tour and dinner, Lederman said the basic research being conducted at Fermilab is an example of the type of studies that could have a profound effect on the lives of people years into the future. What that effect might be is not known now, but history is resplendent with examples of basic research having stunning influences on technology.

Out of basic research, out of investigations by scientists who were not searching for an applied product, came the ultra high vacuums that led to television tubes, x-rays, videos, transistors, integrated circuits, microprocessors and computers, to name some, he said. "Technology has within it the means for fulfillment," he told his audience.

Lederman talked about the energy crisis and some of the proposed approaches to ease it. Each approach has serious limitations, he said. But he added he believes a real solution to the energy crisis exists and that "some kid now in high school" may be the one who years from now finds a way to provide more energy in a manner not dreamed of today. If history is any guide, the solution probably will emerge in some unexpected way from basic research, he said.

Superconductivity, that area of technology where current conducted through super-cold wires meets little or no resistance "has many opportunities for changing our lives," said Lederman. There may come a time when society cannot afford to run current through copper, but instead will be forced increasingly to rely on superconducting wire at liquid helium temperatures (minus 450°F) or



...Science writers tour liquid helium plant...

lower, he also said.

Fermilab is one of the world leaders in research and development on superconductivity, he added. "We are involved in the pioneering of superconducting technology," he said in response to a question after his talk. "The roots of our technology are based on the past doing of the kinds of things we are doing at Fermilab," he said during his talk.

Fermilab's director then shifted his attention to the internationalism of physics. He pointed out that in high energy physics laboratories around the world, researchers come from an international community of scholars and scientists. "Fermilab qualifies as a very international laboratory," he said.

Earlier in his talk, Dr. Lederman linked together cosmology and high energy physics, saying the two quite different fields of study have areas that interest both cosmologists and physicists. He identified some of them as the big bang theory of the origin of the universe, black holes and pulsars.

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Cosmologists and physicists are able to help one another understand the complexities of their respective fields, he added.

Cosmology and high energy physics together offer "some of the most exciting things intellectually," Lederman said. For example, in order to trace the history of the big bang, cosmologists need to know even more about elementary particles. To describe what happened immediately after the big bang, cosmologists must wait for physicists to develop higher energy accelerators that probe the atom to deeper levels than present technology allows, Lederman said.

With his welcoming and introductory remarks, Chris Quigg, head of theoretical physics at Fermilab, prepared the group of 50 men and women for what they would soon see and hear. Afterwards, the guests toured the site.

Quigg began his talk by telling the science writers that the two principal concerns of high energy physicists are to study the fundamental constituents of matter and to determine what laws govern their behavior. He then recalled for his audience thoughts of some of the greatest scientists throughout history and how uncanny they had been in their accuracy when describing atoms and molecules.

One of the most profound statements, yet one with great foresight, was made by Democritus, who said around 450 B.C., "The only existing things are atoms and empty space; all else is mere opinion."

After Quigg had traced the development of high energy physics from the earliest to the present time, he talked about those things that "keep me awake at night." He was referring to some of the unanswered questions that are puzzling physicists today, questions, answers to which will have a profound effect on the direction particle physics takes in the coming years.

He was particularly interested in the grand unified theories, now under construction, that may lead to new species, like a leptoquark or to new interactions like a quark yielding a lepton. Quigg also asked if chaos is at hand, referring to the 35 elementary particles now recorded: 15 quarks, 6 leptons, 8 colored gluons, 1 photon, 3 intermediate bosons, 1 Higgs' scalar and 1 graviton.

Among the possible resolutions are sub-



...Russ Huson (far right) explains the superconducting magnet assembly facility to visiting science writers. Here they examine a magnet in the early stages of its assembly. The facility was one of several they visited during their tour...

units of the known elementary particles and an elegant mathematical structure that describes the properties of the fundamental particles.

Margaret Pearson, head of the Public Information office, and Beverly Kaden, secretary, were primarily responsible for planning the science writers visit.

Helping with the tour and serving as experts in answering various questions were Chuck Ankenbrandt, Miguel Awschalom, Joe Biel, Chuck Brown, Dick Carrigan, Bruce Chrisman, Jim Finks, Gene Fisk, Wm. Fowler, Russ Huson, Chuck Marofske, George Mulholland, Tom Nash, Uriel Nauenberg, Linc Read, Dennis Theriot, Tim Toohig, Don Young and Ron Walker.

Some of the facilities visited were the Cockcroft-Walton pre-accelerator, Cancer Therapy Facility, main control room, laboratory E in the Neutrino Area, tagged photon laboratory, 15-foot bubble chamber and the cooling ring.

President of the Chicago chapter is Ronald Kotulak, science writer for the Chicago Tribune.

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RESEARCH SERVICES ROTATES COMMAND

Marvin E. Johnson has been named acting head of Research Services.

He succeeds Paul Mantsch, who will spend the next six months conducting experiments. At the end of this time, Mantsch will return as head of Research Services, a position he has held for nearly a year before this current hiatus.

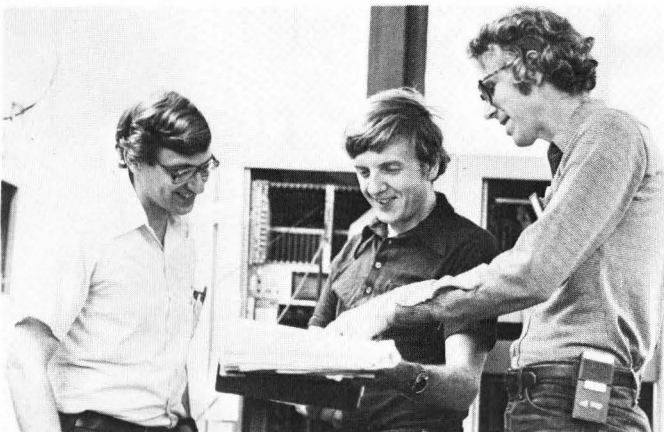
Morris E. Binkley will serve as acting associate head of Research Services during this six-month period.

Johnson, who had been associate head for nearly a year, was awarded his doctorate in high energy physics in 1973 by Yale University. His dissertation was on "Inclusive Studies in 13 GeV/c K-minus Proton Interactions."

He has been with Fermilab since April 1973, first joining the Neutrino Department, then coming with Research Services as head of the beam systems group. His wife, Jean, also a physicist, works for Yale University running experiments at Fermilab.

Mantsch will spend the next six months primarily working with Experiment #516. The collaborators for this experiment will study the production of charmed particles in photon-proton scattering. The experiment is set up in the tagged photon laboratory and is expected to begin running in late July.

Binkley has been with Fermilab since April 1973. He earned his doctorate at Cornell University and is a member of the American Physical Society. He and his wife, Carol, have two children, John 10, and Christopher 6.



...L-R) Mantsch, Johnson and Binkley...

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...Picnic committee (L-R) Ovitt, Baaske, Moylan, Schuh and Grozis...

NALREC SEEKS VOLUNTEERS FOR FERMILAB ANNUAL PICNIC

The weather is warming up and once again Fermilab is warming up for its popular NALREC family picnic, this year scheduled for July 22.

The picnic will go from 11 a.m. to 6 p.m., but to get it moving and running smoothly, NALREC is calling for volunteers to help the day of the picnic with ticket sales, food serving and the many other duties that go into the making of a family picnic. NALREC also needs baked goods, such as cakes, cupcakes and cookies for prizes in the cake walk.

"If you are coming to the picnic and can volunteer some time to work or if you are willing to bake something for the picnic, please call me," said Brenda Moylan, a member of the picnic committee. Her number at Fermilab is 840-3218.

Other members of the committee are Ralph Ovitt, Chuck Grozis, Keith Schuh, Jo Baaske and Jesse Guerra.

Ten cents will purchase the main course: chicken, baked beans and potato salad. Pop, other beverages, cotton candy and pop corn also will be available. Some of the activities will include rides for children, a teen town, model airplane show, a cake walk, magic show and radar ball. And watch out for "clowns, clowns, clowns," said Moylan.

There will be no free tickets given to employees prior to the picnic because prices have been reduced. Tickets may be purchased at the entrance. Additional details about the picnic will be reported in future issues of FERMINews.

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FALL HOUSING REQUESTS DEADLINE NEARS

The deadline for placing reservations for fall on-site housing is July 13.

Housing assignments are based on the anticipated running schedule. Responses to requests will be mailed the week beginning Aug. 5. Starting dates for fall occupancy will begin the week of Sept. 2.

The Housing Office, Ext. 3777, has additional information.

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A FEW MOMENTS OF COURTESY...

As a courtesy to fellow workers, Fermilab is asking people who smoke to refrain from smoking those few moments they may be in confined spaces.

By not smoking when they are in elevators or in Fermicabs, for example, smokers can make life more comfortable for those people who react adversely to or who have an allergy to smoke, said John R. Paulk, head of Site Services.

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SAFETY OFFICE EXPANDS TRAINING PROGRAM

The Safety Office has expanded and upgraded its safety training programs.

A variety of courses will be offered through July. Some of these are construction safety, defensive driving, first aid, cardiopulmonary resuscitation, compressed gas safety and fire training.

Detailed calendars of the safety training for each month, as well as course descriptions, are available from the Safety Office.

Additional information may be obtained from Marilyn Kasules, Ext. 3607.

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...*"User Center users, watch out. Don't tread on the garden," could very well be what the life-size scarecrow would say if it could. Constructed by Margaret Meister, an employee with the buildings group, and Francine Norton, a summer employee, its job is to remind people that in its purview grows a garden of corn, pumpkins (under the hay) and giant Russian sunflowers (next to the building). The hard hat is to protect it from the faltering Skylab. Meister helps care for flower beds throughout the site...*

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REMINDER ABOUT CAR POOLS

The Public Information Office, CL1-W, rapidly is accumulating an inventory of persons who are interested in forming car pools. Any person who wants to submit his or her name or who wants to see who else lives nearby, can obtain this information at the PIO. Beverly Kaden, secretary, Ext. 3351, is responsible for maintaining the car pool list.

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"NOSFERATU"

Presented by Fermilab International Film Society

Friday, July 13, 8 p.m.

Central Laboratory Auditorium

Directed by F. W. Murnau, "Nosferatu" was the first film version of the novel "Dracula." Even today, the film is regarded as a towering achievement in atmospheric cinema and among the finest horror-fantasy films ever made.

PG Silent with musical score 63 minutes Adults, \$1.50 Children, 50¢