

FERMILAB NEWS

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LEDERMAN PRAISES QUALITY OF SYMPOSIUM

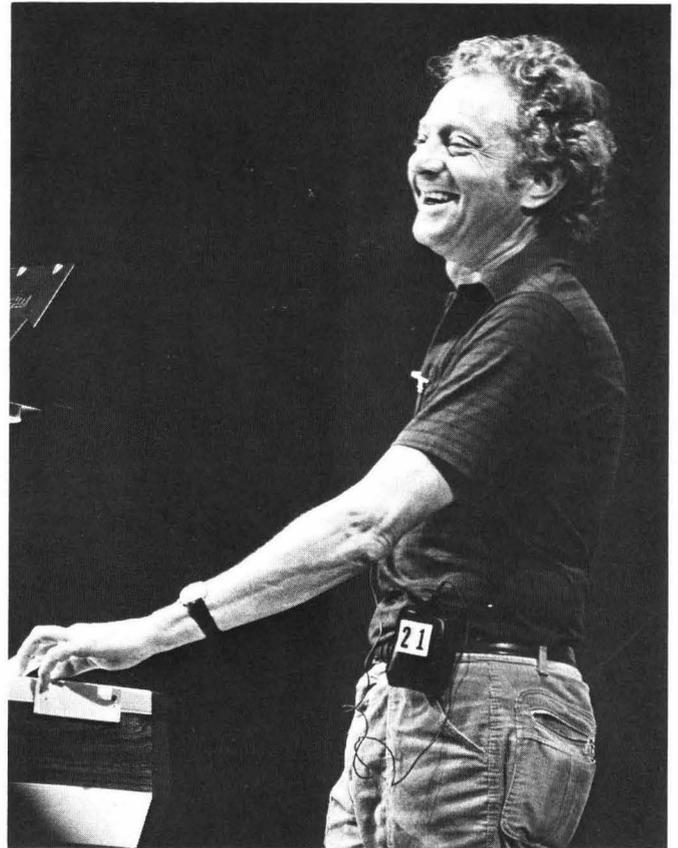
Leon Lederman, Fermilab director, told scientists and students attending the 1979 International Symposium on Lepton and Photon Interactions at High Energies that he has been "going to conferences for a long time, but never have I heard so many beautiful lectures." In delivering the concluding remarks August 29, Lederman described the program as a "fantastic array of physics" and said it was a "tremendous experience to listen to all of this." He also said the technical content of the symposium had thrown considerable more light on a number of questions, but added that investigators must ask yet harder questions and that a lot of work still needs to be done.

He used phrases like "elegant," "triumphant" and "striking progress" to describe the physics he and others had heard, a physics that reached ever deeper into the atom, a physics in which theory and experiment played their respective roles dramatically.

Lederman had his personal list of symposium highlights. Ranking high were the experimental results from PETRA in Hamburg, Germany, that offered further support for the existence of gluons. The Fermilab director also noted that other data presented at the symposium still was unable to uncover a sixth quark.

Another highlight, in his opinion, was further verification of the electron being very small. But speculating about the future when higher energies will be available, maybe "we will find little people running around inside the electron," he said. But it will have to be hit with many hundreds of GeVs, he added.

Speaking on behalf of the symposium's participants, Dr. Valentine L. Telegdi, University of Chicago and Zurich and chairman of the symposium's final session, thanked Dr. Lederman, Fermilab and members of the various committees for their helpfulness and sensitivity and for putting together an outstanding program. * * * * *



...Leon Lederman gives concluding remarks...



...Herwig Schopper, director general of DESY, addresses the media at a press conference about gluons...

ADVANCES CAPTURE SCIENTISTS' FANCY
AT INTERNATIONAL PHYSICS SYMPOSIUM

Experimental evidence for the existence of the gluon brought a wave of excitement to scientists attending the recent ninth biennial International Symposium on Lepton and Photon Interactions at High Energies.

But it was only one of several areas of high energy physics that caught the imagination of more than 600 scientists from around the world who attended the seven-day symposium held in the Central Laboratory auditorium. The conference came at a time when physicists have great hope and optimism that they are finally beginning to understand the strong nuclear force and its relation to the other three forces of nature--electromagnetism, the weak nuclear force (the one responsible for radioactivity) and the gravitational force.

During the past 20 years, more than a hundred so-called elementary particles have been discovered. A relatively new theory called quantum chromodynamics (QCD) postulates that all these particles, and indeed everything in the universe, are built from only a handful of fundamental particles. According to this new theory, all matter is composed of two classes of point-like particles called quarks and leptons. At present, scientists believe there are at least six different leptons (the electron being the most familiar) and at least six different quarks.

Other particles act as messengers to transmit forces between the quarks and leptons. For example, the photon is the carrier of the electromagnetic force between charged particles. The new particle, the gluon, transmits the strong nuclear force between quarks and binds them together in groups of two or three to form the rich spectrum of elementary particles observed in experiments.

The excitement came when the existence of gluons--which one physicist said "stole the show at this symposium"--received strong support from experimental data.

Four groups of experimenters at the high energy physics laboratory--PETRA--in Hamburg, Germany, studied head-on collisions between electrons and positrons (the electron's anti-particle). When an electron slams into a positron, they annihilate each other to form a fierce fireball of energy.

At lower energies, this fireball quickly decays into two back-to-back streams of particles called jets. These two jets are produced by the fragmentation of the two quarks that emerged from the collisions. Theory predicts that at high energies the quarks could radiate gluons that would produce a third jet. All four PETRA experiments saw events with three distinct, well-defined jets. The third jet has properties that agree with theoretical predictions for the gluons.

The same PETRA experiments that generated evidence for the existence of gluons also showed that the electron is at least a thousand times smaller than the proton, verifying the theory of electromagnetism (quantum electrodynamics) over a remarkable range of distances.

Two results from SPEAR--the electron-positron colliding rings at the Stanford Linear Accelerator Center--are regarded by physicists as especially noteworthy. One experiment produced new evidence for the charmed baryon. This particle is the analog of the proton, but it has a charmed quark in place of one regular quark. In the other experiment, the charmed eta, a particle similar in many ways to the J/Psi particle discovered in 1974 may have been observed.

A research group using a sophisticated detector at CERN--a European nuclear research organization based in Switzerland--presented evidence for a particle that is a bound state of the bottom quark--originally discovered at Fermilab--with an up quark.

Several experimental teams reported measurements for the lifetimes of charmed particles. Scientists generally agree that the lifetimes are approximately one-trillionth of a second. More precise data will be obtained on this subject in experiments that will be conducted at Fermilab and CERN within the next year.

Another subject at the symposium that

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FERMINEWS is grateful to Joel Butler and Rosemary Baltrusaitis, members of the Symposium Publicity Committee, for providing the information in this story.

THE HUMAN RIGHTS POLICY OF FERMILAB

PRINCIPLE

The policy at the Fermi National Accelerator Laboratory is to pursue its scientific goals with an emphasis on equal employment opportunity and a special dedication to human rights and dignity.

Fermilab attracts scientists, not only from this country, but from many other nations all over the world. Foreign visitors, laymen as well as scientists, come to the Laboratory to participate in its work. They represent a wide variety of races, nationalities, cultures and beliefs. It is essential that we provide an environment and maintain an atmosphere in which both staff and visitors can live and work with pride and dignity without regard to such differences as race, religion, sex, or national origin.

We take affirmative action to insure that all have the opportunity to contribute to the Laboratory's activities, limited only by their abilities and efforts. We recognize that the provisions of equal opportunity may be insufficient to counteract the effects of past discrimination in such areas as education, employment and housing. Toward the end of providing for real equality of opportunity, Fermilab has implemented and will continue to develop and implement aggressive and innovative employment practices and training programs.

In any conflict between technical expediency and human rights we will stand on the side of human rights. This is because of our dedication to science. The support of human rights in our Laboratory and its environs is inextricably intertwined with our goal of making the Laboratory a center of technical and scientific excellence. The latter is not likely to be achieved without success at the former.

POLICY

It is the policy of Fermi National Accelerator Laboratory that all personnel actions and general treatment of employees and applicants be handled strictly on a merit equal opportunity basis, without regard to age, race, color, national origin, religion, sex, physical or mental handicap, or because an individual is disabled or a Vietnam-era veteran.

The implementation of this policy shall include but not be limited to decisions on recruitment, hiring, promotions, compensation, benefits, transfer, layoffs, return from layoffs, laboratory training, education tuition assistance, and social and recreational programs. Promotion decisions within the Laboratory are to be in accord with principles of equal employment opportunity. This is to be insured by imposing only valid requirements for promotional opportunities.

The successful implementation of the affirmative action program will benefit the Laboratory through the full utilization and development of human resources. Further, all levels of management are assigned an equal share in this responsibility. Management performance in meeting affirmative action objectives will be evaluated in an equivalent manner to other business and Laboratory related objectives.

It is my desire and expectation that each member of management and each employee will fully support and join Fermi National Accelerator Laboratory's complete commitment to equal opportunity.

LEON M. LEDERMAN
Director
Fermi National Accelerator Laboratory
June 1, 1979

The implementation of the above policy is monitored by the E.E.O. Manager, Ms. L. Price-Joyner. She may be contacted at (312) 840-3591.

POLICY STATEMENT ON EMPLOYMENT OPPORTUNITY FOR THE HANDICAPPED, DISABLED, AND VIETNAM ERA VETERAN

It is the continuing policy of this Laboratory to recruit and offer equal opportunity in employment and promotions to qualified handicapped individuals and to Vietnam era veterans and to ensure that all of our personnel policies and activities are administered in a non-discriminatory manner. This philosophy reflects a continuing commitment to equal employment under the guidelines of the Rehabilitation Act of 1973 and the Vietnam Era Veterans' Readjustment Assistance Act of 1974, both as amended. These federal regulations require government contractors, such as Fermilab, to take affirmative action to recruit, employ, and upgrade in employment qualified handicapped persons and the disabled and Vietnam era veterans.

Fermilab has developed an Affirmative Action Program concerning employment of the handicapped and the veteran. Applicants and employees, who believe they are covered by these regulations and who wish to be considered in the Affirmative Action Program, are encouraged to identify themselves through the Personnel Department. A form has been prepared for this purpose.

Submission of information is entirely voluntary. In addition, all data obtained will be kept confidential, with the following exceptions:

- 1) Supervisors and managers may be informed regarding restrictions in the work or duties of handicapped individuals and with respect to necessary accommodations;
- 2) First aid and safety personnel may be informed, where and to the extent appropriate, if the condition may require emergency treatment; and
- 3) Government officials investigating compliance with Section 503 of the Rehabilitation Act of 1973 and Section 402 of the Vietnam Era Veterans' Readjustment Assistance Act of 1974, shall be informed.

CHARLES MAROFSKE
Personnel Manager
July 27, 1979

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attracted considerable interest was new accelerators. Four were discussed:

- The energy saver doubler, a project that will enable Fermilab to conduct physics at energies of 1 TeV and to collide 500 GeV protons with 500 GeV antiprotons;
- LEP, a super high energy version of PETRA in which 100 billion volt electrons will collide with 100 billion volt positrons;
- The proton-antiproton colliding ring at CERN;
- The proton-proton colliding ring project, called ISABELLE, at the Brookhaven National Laboratory.

One major objective of these new machines will be to attain the exceptionally high energies needed to produce particles known as W and Z. They are believed to be the carriers of the weak nuclear force.

The symposium was sponsored by Fermilab, the International Union of Pure and Applied Physics, the National Science Foundation and the U. S. Department of Energy.

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IN THIS ISSUE

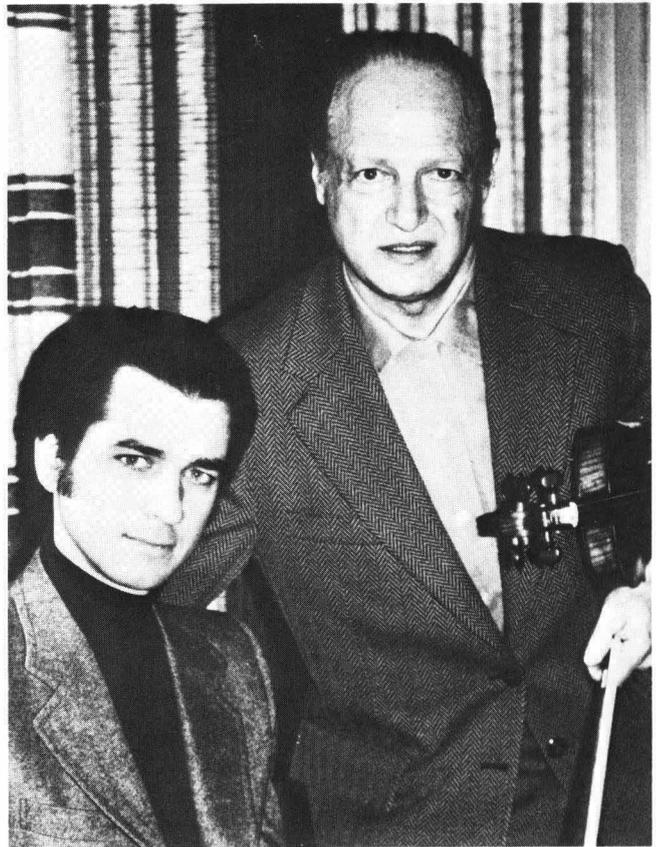
This issue of FERMINES has a pullout sheet on two current Laboratory policies. Lauta Price-Joyner, equal opportunity manager, explains what they are.

"From scientist to support worker, Fermilab attracts people who represent a broad spectrum of races, nationalities, religions and cultures. Therefore, it is essential that the Laboratory provide for all its employees and visitors an environment where each individual is respected and can work with pride and dignity.

"With this in mind, Fermilab is taking this opportunity to publicize the Laboratory's current 'Equal Employment Opportunity Policy Statement' and the 'Policy Statement on Employment Opportunity for Handicapped, Disabled and Vietnam Era Veterans.'"

Questions about the Laboratory's equal opportunity program should be directed to Price-Joyner, Ext. 3591. Her office is on CL6-E

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...Tocco (left) and Sorkin...

SORKIN-TOCCO DUO-CONCERT COMING TO FERMILAB

Leonard Sorkin, first violinist of the Fine Arts Quartet, and James Tocco, an American pianist who has won eight major international competitions, will give a duo-concert Sept. 22 at Fermilab.

The performance will begin at 8:30 p.m. in the Central Laboratory auditorium. The price of each reserved seat is \$4. Reservations may be made through the Guest Office, Ext. 3124. They will appear here as part of the Fermilab Arts Series.

The two performers recently made a record of Brahms's piano-violin sonatas.

Sorkin's reputation already is firmly established. Tocco, whose career is ascending, has been lauded by critics, one of whom described him as a "pianistic all-rounder, a virtuoso with heart...(an) exceedingly sympathetic, elegant artist." A New York Times review of one of Tocco's concerts said, "It was a joy to hear keyboard performances of such obvious conviction and pervasive sensitivity."

The arts series is arranged by the Fermilab Auditorium Committee.

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NALREC PLANS BALL PARTY

Volleyball, basketball, baseball, tennis, soccer...

If these are enticing, then NALREC's ball party is the place to be. It'll run from 5:15 to 9 p.m. Sept. 14 at the Village barn. Food and beverages will be available, and music will play in the background. As the organizers of the program said, "Come on out and have a ball."

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FILM ON HAWAII

Thinking about Hawaii?

Then an ideal next step would probably be a film on Hawaii that will be shown Sept. 17 at noon in the west conference room on the first floor of the Central Laboratory.

The 30-minute film will be shown through the courtesy of Prestige Vacations.

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HAPPY BIRTHDAY, MARGE

Marge Rundle, 417 S. Water St., Batavia, celebrated her 77th birthday Aug. 23 at Fermilab.

Although she had never been here before, she had followed Fermilab's history closely. When her relatives asked her what she would like to do on her birthday, she told them she'd enjoy visiting Fermilab.

In 1975, she was chosen Batavia's citizen of the year for her many activities and contributions to the community. Recently her name was submitted to Gov. James Thompson for an Illinois Arts Council award in recognition of her civic work in art.

* * * * *



...Captain H. S. Toostle and Cindy Cilyo...

FERMILAB EMPLOYEE PROUD OF DAUGHTER

Frank F. Cilyo, electrical engineer with the Accelerator Division, certainly has a right to be proud of his daughter.

Cynthia Lou Cilyo has come a long way, from the time she was awarded a Universities Research Association scholarship to recently receiving her diploma and flight surgeon's wings from Capt. H. S. Toostle of the U. S. Navy Medical Corps. She had completed her studies in aerospace medicine at the Naval Aerospace Medical Institute in Pensacola, Florida. At the ceremony there, her mother had the honor of pinning the wings on her. Toostle is commanding officer of the institute.

Presently, Cynthia Cilyo is a first-year resident at the Naval Regional Medical Center in San Diego, Calif. She was awarded her doctor of medicine degree by Northwestern University in April 1979.

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"LAST TANGO IN PARIS"

Presented by Fermilab International Film Society

Friday, Sept. 14

8 p.m.

Central Laboratory Auditorium

A Marlon Brando performance that won world acclaim. Directed by Bernardo Bertolucci, the film focuses on a man consumed by guilt, anger and lust. It is a film of tempest, eroticism and violence, but also a deep essay on human nature. Newsweek called the movie "a genuine masterpiece of staggering proportions."

Color

R

129 minutes

Adults \$1.50

Children, 50 cents