

# FERMILAB NEWS

 Fermi National Accelerator Laboratory

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## CHINA'S FIRST ACCELERATOR

Five years is the construction period set by the Peoples Republic of China for its first particle accelerator.

The Chinese entry into world high energy physics studies was outlined at Fermilab June 13. Speaking at an Accelerator Meeting was Prof. Hsieh Chia-lin, chief of the accelerator division in the Institute of High Energy Physics of the Chinese Academy of Sciences. He also heads a 10-man contingent of Chinese accelerator design specialists working at the Laboratory this summer.

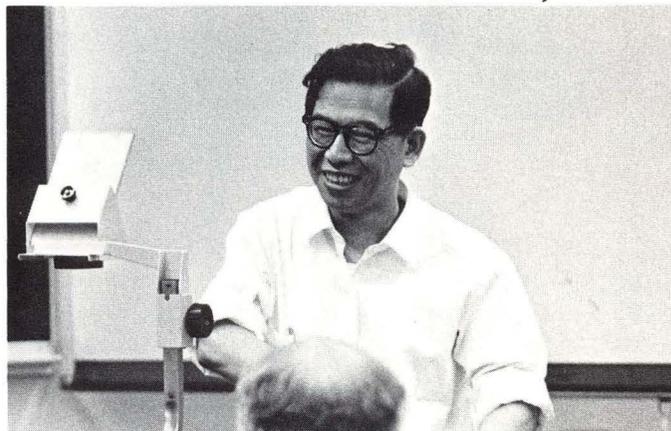
The Chinese began studies here May 15 at the invitation of Dr. Robert R. Wilson, Fermilab director. They will work and live on site until July 15.

Prof. Hsieh, an accelerator physicist, said a Chinese accelerator site is being mapped out near the area of the Ming Tombs outside Peking, the country's capital. Lack of HEP experience and computing facilities have influenced design progress on China's accelerator, he said. However, he said, "Enthusiastic help from Fermilab's staff has put the design project on firmer ground and solved some problems."

Other Chinese study teams, he said, are focusing on magnet measurement and beam abort systems at the CERN laboratory in Geneva, Switzerland, and experimental physics at the DESY facility at Hamburg, West Germany.

Over 100 Chinese scientists are now assigned to the accelerator project, according to Prof. Hsieh. The technical staff is steadily expanding and will receive substantial industrial support, he added.

Proposed by China is a 50 GeV (billion electron volt) accelerator about



*...Prof Hsieh Chia-lin, leader of Chinese studying at Fermilab, describes China's accelerator plans...*

0.85 miles in circumference. (Fermilab's 500 GeV machine is four miles around.) Looking ahead, Prof. Hsieh said the next step of the Chinese accelerator will be a giant one toward a much higher energy.

Why is China undertaking high energy physics studies? The speaker cited three main reasons. They are, he said:

1. China is attempting to catch up with advancements in science and technology. HEP is a fundamental, "frontier" science, Prof. Hsieh says, that may unlock the secrets of the universe. It deserves a national commitment, Chinese leaders have decided.
2. As Chinese science advances, the country's industry will be challenged to upgrade technology and production methods. Hopefully, China's industrial capability will improve from stretching to meet demands of accelerator scientists.
3. Spinoff applications from HEP studies are expected, Prof. Hsieh said. In addition to fundamental research results, economic and humanitarian benefits may be derived. For example, proton therapy for cancer victims may also be possible, he said.

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## 21 TONS OF ART

Art and artifacts at Fermilab have been enhanced with an ornamental steel arch over Pine Street near Kirk Road.

The tri-span sculpture, entitled "Broken Symmetry", tips the scales at about 42,000 pounds--21 tons. It rises 50 feet above the road at its apex.

In his concept, Fermilab Director R.R. Wilson has freely adopted the style of the sculptor Alexander Calder to exemplify the notions of symmetry and symmetry-breaking that are so important in the physics of elementary particles studied at Fermilab.

"The twofold mirror symmetry about the east leg, indicated by the red and the black, is nearly perfect," Dr. Wilson said. "The more basic underlying threefold symmetry is perfect at the base, but deteriorates with height and is completely broken at the top of the arch. However, when viewed from directly above the center, or directly below, the arch again appears to be perfectly symmetrical."

In coming to the concept, Dr. Wilson decided to utilize some steel deck plate from the USS Princeton -- as an expression of the "swords into plowshares" use at Fermilab of the thick iron plates of which the battleship had been made. The plates, acquired by Fermilab in 1972, are also used to provide thick absorbers of radiation in the experimental areas.

A two-week erection effort wound up last week under the guidance of Architectural Services' Gerda Pajic, project leader, and Marv Warner, department head.

Working from Wilson's concept, drawings were done by former Laboratory designer Tom Pawlak, now with Argonne National Laboratory. Jerry Peterson, Machine Shop foreman, made tooling, did layout work and cut elements. Handling welding assignments were Jim Forester, weld shop foreman and Gerald Knauf, welder. Mike Mascione of Architectural Services inspected the finished product.

Located 614 feet east of Kirk Road, the sculpture's legs are bolted to concrete caissons. Each caisson, or concrete "root", is three and one-half feet in diameter and 21 and one-half feet deep. Each element's foot is anchored with eight bolts to a base plate.



...*"Broken Symmetry,"* a new metal sculpture, is erected over Pine Street...



...*Painter puts finishing touches on sculpture element...*



...*Welder joins three "Legs" to pipe...*

The arch was painted on the ground before erection. The west face is flat black; the east face is red.

Element "C", tallest of the trio at 50 feet, is based south of Pine Street. It was erected first with a 10-inch diameter steel pipe connected to its vertical edge. Including pipe and base plate, C weighs 15,500 pounds.

Element "A", based north of Pine Street, was the third element erected. A is 45 feet high; it weighs 13,500 pounds. Element B was welded to Element C before Element A was erected.

The lowest of the elements, B stands 41 feet tall in the Pine Street median strip. B weighs 12,900 pounds. It was also welded at the top to the pipe. Clearance above the road is 32 feet.

Three holes cut in each element are designed to act as wind "spoilers," reducing air current vibrations. A lightning arrestor is included.

After the arch was erected and welded at the top, the subcontractor plumbed the structure in its final position and welded elements to base plates. Welds were certified by ultra sonic and magnetic analysis.

Future plans call for the Pine Street gatehouse--175 feet east of the arch--to be replaced with a modern circular gatehouse designed to harmonize with the arch.

#### PROFILE OF PRINCETON V

"Battleship" armor from the U.S. Navy aircraft carrier Princeton is incorporated in "Broken Symmetry," Fermilab's newest metal sculpture. The fifth Princeton since 1842, the latest version carried helicopters. Commissioned in 1945, the ship operated in the Atlantic until June, 1946 when she was transferred to the Pacific fleet. Decommissioned in 1949, she was reactivated for combat duty during Korean hostilities. Later Princeton served in Vietnam and in April, 1969, was designated prime recovery ship for Apollo 10--the lunar mission which paved the way for Appollo 11 and the first landing on the moon. She was decommissioned May 20, 1971.

#### CREF VALUES LISTED

Within the laboratory retirement plan, Fermilab employees can direct a portion of the investment into the CREF program. Funds invested buy accumulation units--shares in investments CREF makes in a broadly diversified stock portfolio. Accumulation unit values are calculated monthly by dividing the end-of-month market value of the total CREF accumulation fund by total accumulation units owned by participants.

Dividends and other earnings which CREF receives are reinvested. These funds buy more accumulation units, which are credited to employees' retirement accounts.

CREF accumulation unit values for the first five months of 1978 were:

January	\$35.72
February	\$34.96
March	\$36.15
April	\$39.28
May	\$39.52

The unit value figure tells a double message. First, it reflects month-by-month dollar value of each unit an employee owns. Second, the figure is used as the current market price for new accumulation units available for purchase by employees. Unit values rise with rising stock market prices; falling prices decrease unit values.

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Fermilab International Film Society Presents

#### "MY NIGHT AT MAUD'S"

Friday, June 23 8:00 P.M. Auditorium

A French production, "My Night at Maud's" is the story of Jean-Louis, Françoise and Maud. Jean-Louis is a quiet, devout Catholic; Maud, an elegant divorcee; and Jean-Louis meets Françoise at church. The film is a quiet, sensitive probing of the definitions and relationships of love, sex, life and art. Rated R. 105 minutes. In French, with English subtitles.

Admission: \$1.50 for adults

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## MAIL ECONOMIES SOUGHT

Fermilab employees and users are asked to help the Laboratory offset higher postage rates. Across-the-board increases by the U.S. Postal Service took effect last month.

"The new postal rates will cause a dramatic increase in costs at Fermilab," says Carolyn Hines, manager of communications services. She estimates mailings will cost the Laboratory \$73,000 in 1978, an increase of 158 percent over five



...Sorting Fermilab Mail: Z. McGhee

years ago.

"In the past five years," she said, "Fermilab employment has increased 35 percent; but mail volume has risen 80 percent. Since the U.S. Postal Service increased rates by 20 percent last month, all Fermilab employees are urged to use the mail service carefully and only for essentials. Personal mail will be handled only if stamps are affixed."

According to Mrs. Hines, the Laboratory attempts to economize by pre-sorting bulk mail and printed matter. A summary of fees and postal services available was distributed to department heads and secretaries to enlist their support in the cost-cutting campaign.

For more information, contact the Mailroom, CL-W Catacombs, Ext. 3210.

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## NEW ARRIVALS



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## SIMPLE LAWS RULE UNIVERSE

"Physicists have a prejudice that nature is very simple; simple laws rule the universe."

Those were the comments of Steven Weinberg at Fermilab June 9. The Higgins Professor of Physics at Harvard University spoke in the Laboratory's Science and Humanities lecture series. The sixth program in a 1977-78 series, "The Search for Symmetry" was Weinberg's topic.

Symmetry, Weinberg said, refers to something looking the same when viewed from different vantage points. He used slides and viewgraphs to illustrate. For example, he mentioned that left and right sides of a human face seem identical; the moon is a symmetrical sphere; and the universe is a group of symmetries.

"At nature's very deepest levels," Weinberg said, "symmetry principles play a fundamental role. Nature's laws are unknown; it's easier to unlock the secrets by looking at symmetries."

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## MEMOS TO REMEMBER ...

- "Preservation Hall Jazz Band" in concert - Saturday, July 15 - 8:30 p.m. Fermilab Auditorium. Reserved seat tickets \$6 each from the Guest Office CL-1W, Ext. 3124/3440.
- All-Laboratory picnic - Sunday, July 23 - 11 a.m. to 6 p.m. - Village recreation area. Volunteer workers needed! For information contact Barb Schluchter, CL-2W/Ext. 3199 or Cindy Carra, CL-2W/Ext. 3894.