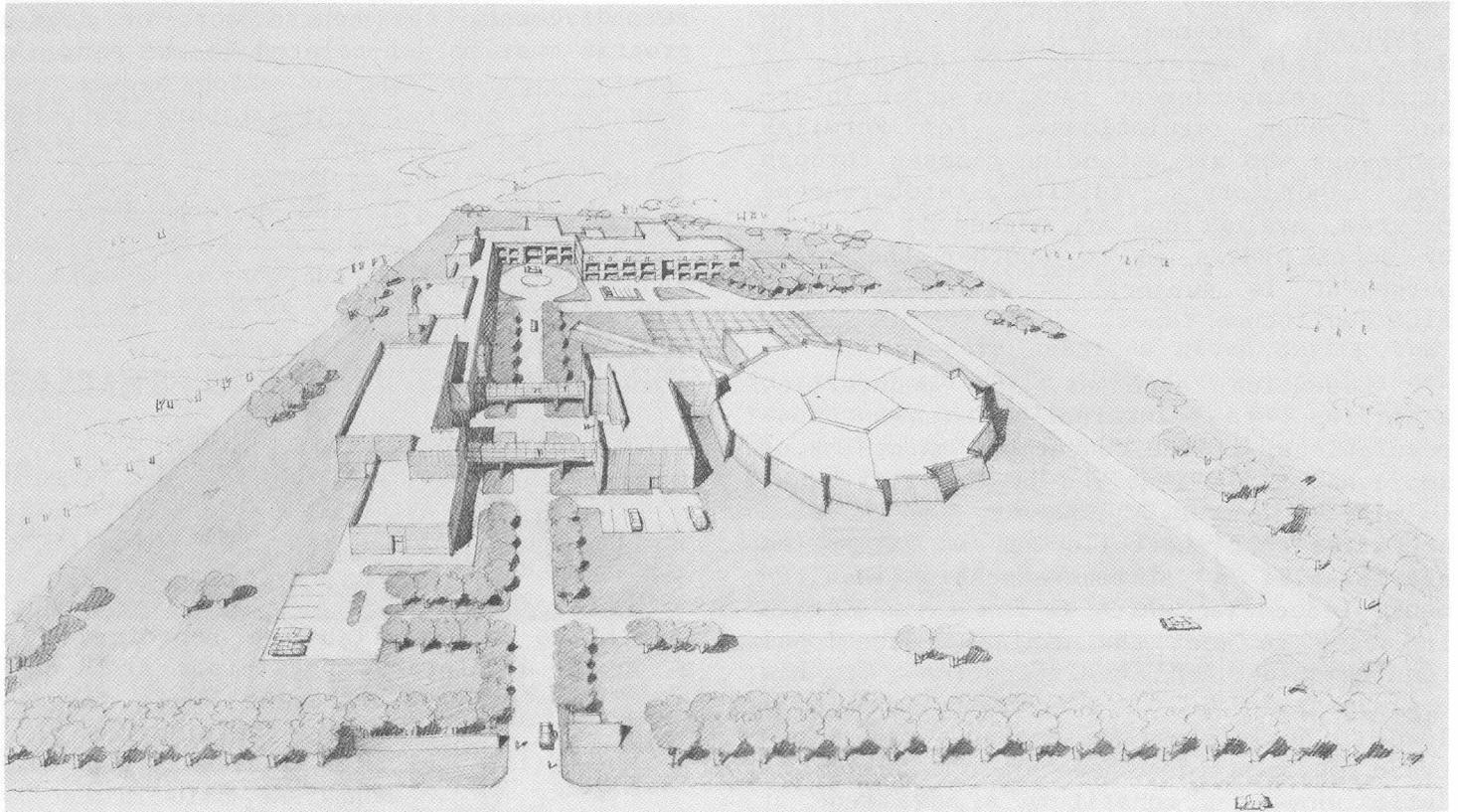


August 23, 1984

FERMI NATIONAL ACCELERATOR LABORATORY

# FermiNews

## TENG APPOINTED DIRECTOR OF TAIWAN SRRC



*Artist's drawing of the Synchrotron Radiation Research Center in Taiwan.*

Dr. Lee Teng, Fermilab accelerator physicist, has been appointed director of Taiwan's recently funded \$30 million Synchrotron Radiation Research Center (SRRC), the island's first large scale R&D project. Using modern telecommunication devices, Lee devotes half time to the project which usually means traveling to Taiwan every one or two months. Lee is assisted by a Deputy Director, Dr. Thomas K. C. Liu, who is in Taiwan to direct the efforts of the rapidly growing staff composed at the moment of about 25 administrative and technical personnel.

The SRRC is a facility for doing basic and applied research in many fields of science and engineering; it is scheduled for completion in five years. The electron storage ring will have an energy of 1-1.5 GeV, a 250-MeV linac (40 meters long), and a storage ring 96 meters in circumference with beam injected at 250 MeV and accelerated to 1-1.5 GeV by the rf system, then

stored for several hours emitting synchrotron radiation all this time. The beam current is 1/2 ampere.

The site for this center is in Hsinchu, about 50 miles southwest of Taipei, the capital of Taiwan, in a government-operated science-based industrial park. The site itself consists of about 12 acres and is situated next to the Tsing Hua University. The SRRC office is now located in Taipei; the project moved in on July 1. The partitioned one-floor office reminds Lee of the Oak Brook office Fermilab started out in. The current plan is to keep this Taipei office even after moving to the site.

At present, an architectural engineering firm has been engaged, and soil-boring tests on the site have been completed. The civil engineering design is more than half finished. Injector linac bids are being  
*(cont'd. on pg. 2)*

# TUITION REIMBURSEMENTS MAY BE SUBJECT TO TAXES

by Ruth Christ

Recently Congress passed the Deficit Reduction Act of 1984 but failed to include the income and payroll tax exclusion for employer-provided educational assistance beyond its December 31, 1983, expiration date. This reverts the tax question on tuition reimbursement back to prior Internal Revenue regulations. For Fermilab employees who are attending classes through the Laboratory's tuition reimbursement program, evaluations are needed on a course by course basis as to whether the reimbursement is subject to withholding for FICA and income taxes.

Education expenses are deductible, according to Internal Revenue Code regulations, if the education "maintains or improves skills required by the individual in his employment." However, the IRS also specifies that the following two categories are taxable: 1) minimum education requirements (education which is "required of him in order to meet the minimum educational requirements for qualification in his employment," and 2) education which will lead to qualifying the employee for a new trade or business; however, "a change of duties does not constitute a new trade or business if the new duties involve the same general type of work as is involved in the individual's present employment."

In order to properly process tuition support requests beginning with the fall term, we are supplementing the standard tuition reimbursement approval form with a "Tuition Reimbursement Tax Information" form. This tax information form must be returned along with the tuition reimbursement support request form. The information provided will be used to determine if each course is job-related by IRS regulations or fits into the other categories as defined. If the tax information form is not completed, the Laboratory will treat the reimbursement as taxable.

Several years have elapsed since the old IRS regulations were applicable. We anticipate that the IRS will issue new guidelines, but there is no indication when this will occur. Employees who are in the tuition reimbursement program should understand that we will update the tax information form consistent with any new or

revised statements from the IRS and that the ultimate resolution of any tax liability question is the responsibility of the employee.

To be eligible for Fermilab's tuition reimbursement, the course work or degree program must be job-related to the person's current job or one to which he/she can reasonably aspire. The Laboratory will advance the cost of the course(s) for employees not on probation (the advance must be repaid if the person does not satisfactorily complete the course). Questions regarding tuition reimbursement should be directed to Ruth Christ, ext. 3793 or Dotti Swanson, ext. 4367.

## SRRC PROJECT INVOLVES FERMILAB

(cont'd. from pg. 1)

evaluated, and a contract will be awarded soon. The contracts for the prototype magnets are now being negotiated with Taiwanese industrial firms.

While at Fermilab Lee coordinates a group of accelerator physicists from many different U. S. laboratories helping to plan the physics design for the SRRC. In Taiwan he works through a team of deputy directors using Telex, Telefax, and conference telephone. It is not unusual for Lee to receive monthly phone bills of four figures.



Lee Teng

The membership of the board of directors contains scientists and administrators both in Taiwan and the United States. The six U. S. members are Dr. Luke C. L. Yuan of New York, chairman; Dr. C. S. Wu of New York; Dr. Samuel Ting, MIT; Dr. Lee Teng, Fermilab; Dr. Y. C. Li, U.C., Berkeley; Dr. Robert Poe, U.C., Riverside; and the six Taiwan members are Dr. K. T. Li, Executive Yuan; Dr. T. Y. Wu, Academia Sinica; C. H. Yen, Atomic Energy Commission; Dr. Y. S. Chiang, Presidential palace; and Dr. L. A. Chen, National Research Council.

Fermilab scientists who have helped or consulted on the design are Dixon Bogert, Fred Mills, Frank Nagy, Sandro Ruggiero, and Stan Snowdon.

# TEACHER PRAISES FERMILAB SUMMER SCIENCE INSTITUTE

by Peter H. Ogilvie, Wheeling High School

The advent of summer marks a time for many high school teachers to take off on vacation. For 15 Chicago area physics teachers (as well as 15 chemistry and 15 biology teachers), vacation had to wait because they were looking forward to the Fermilab Summer Science Institute. No one



*Pete Ogilvie, Wheeling High School, talks with Chris Hill, Fermilab physicist, about symmetry.*

was disappointed. This institute offered the group a chance to learn about current research and theories in high-energy physics from the people actually involved. The aim of the institute was to expose the participants to a series of lectures, laboratory, computer, and plenary sessions designed to improve their effectiveness as physics teachers.

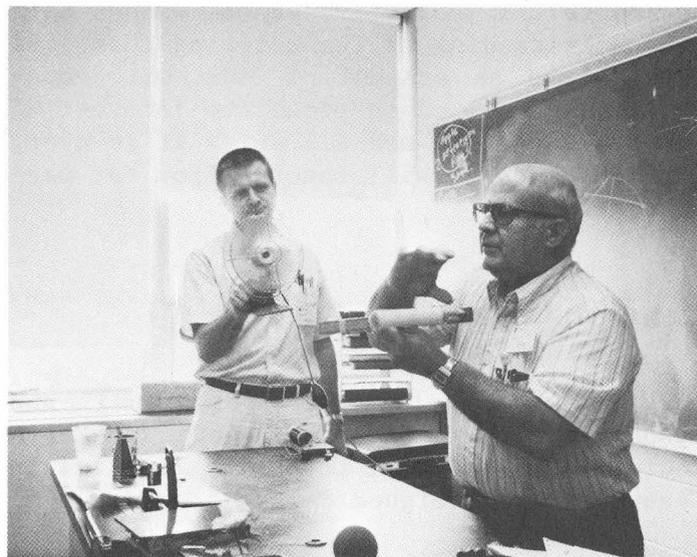
The lectures, given by Fermilab staff physicists, were tied together by the underlying theme of waves and simple harmonic motion. The goal was to illustrate a wide range of phenomena, including nuclear particle resonances and accelerator physics principles, that can be explained by these basic topics. In light of the present quest to unify the basic forces of nature into one, the lectures were quite appropriate. Individual topics included coupled and uncoupled oscillators, particle detectors and accelerators, and wave phenomena. Interwoven with these lectures were diversions into topics such as symmetry and the quark model.

These lectures were by far the most challenging part of the institute. Hours

were spent each day digesting material presented and working on the problem sets assigned. A common sight during the four-week institute was a group of teachers clustered around a table in the second floor lounge or in 1 West, taking time between bites of lunch or sips of coffee to work out the normal modes of an oscillator or the angular resolution of a telescope. For the participants, most of whom had completed their formal education ten or more years previous, the role of a student was foreign. The challenge, however, was met and each of us came away with new insights into problem solving techniques.

The plenary sessions given during the institute addressed such diverse topics as volcanoes, circadian clocks, and lasers. Of particular interest to the physics teachers were the talks given by Rocky Kolb on the "Inner Space/Outer Space Connection" and by Leon Lederman, director of Fermilab, on "Everything You Want to Know About Elementary Particles."

The afternoon lab sessions gave the teachers a chance to actually work with the phenomena presented in the lectures. Labs performed included the investigations of resonant LC circuits, analysis of bubble-chamber photographs, and the use of photocells connected to a microcomputer acting as a timing device for studying harmonic motions. Each participant developed a lab  
*(cont'd. on pg. 4)*



*Bill Conway, Lake Forest High School, assisted by Gil Martin, Highland Park High School, demonstrates Bernoulli's Principle.*

(cont'd. from pg. 3)

related to lecture topics to share with the group. The real fun part of these sessions were the presentations of "eye-catching" demonstrations of physical principles by each teacher. None of us will soon forget Scott Beutlich's "Polish" cannon!

Afternoon computer classes were designed to introduce the participants to Basic programming language and offer the opportunity to develop software for use in the classroom and lab. An exchange of software developed provided each participant with a variety of programs to take back to his students.

On behalf of the other physics teachers, I would like to acknowledge some of the people responsible for this tremendous project. Our thanks go to Chris Hill, Drasko Jovanovic, Leo Michelotti, and Ernie Malamud, our lecturers, for their time and help in exposing us to high-energy physics. We also want to thank the Friends of Fermilab for making this institute possible. Special thanks go to Stanka Jovanovic and Marge Bardeen for their efforts in coordinating the activities, to Lisa Nichol for the countless copies she ran off, and all other staff that made this institute unforgettable.

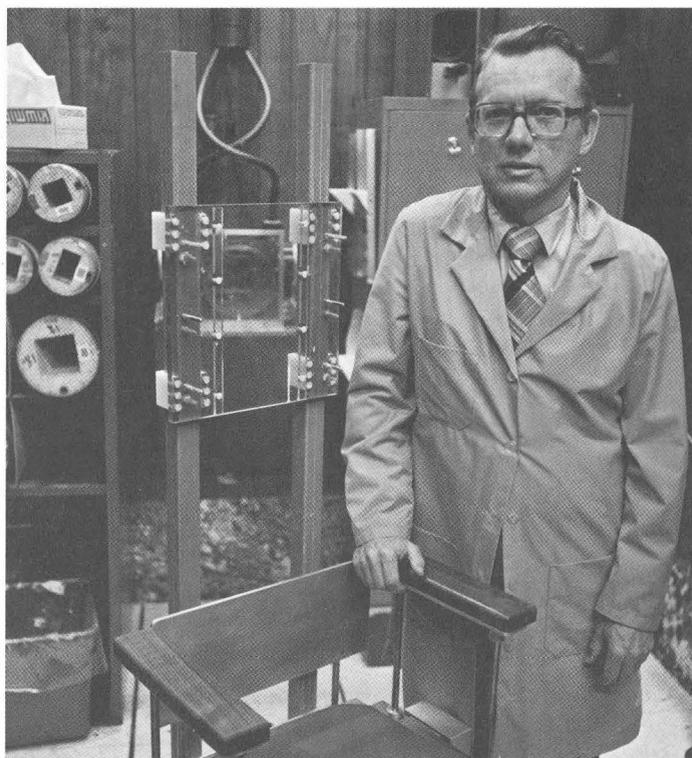
Little did any of us realize we would learn of the possible discovery of the top quark from Drasko Jovanovic one week before the story broke in the *New York Times*. That is the kind of institute it was—exciting and challenging. Each of us will return to his respective school with a better understanding of the unifying themes of physics and an arsenal of labs and demonstrations designed to pique the interest of our students. We are all sorry it is over, but our students will benefit from our participation.

### Congratulations To . . .

James (Accelerator Operations) and Linda Smedinghoff on the birth of Megan Louise on July 27, at Community Hospital in Geneva. Megan weighed 8 lbs. 5 oz.

Fermilab is operated by Universities Research Association, Inc. under contract with the U. S. Department of Energy. Fermilab news is published by the Publications Office, P. O. Box 500, Batavia, IL 60510, phone (312) 840-3278.

## HENDRICKSON GETS SIGMA XI AWARD



*Frank R. Hendrickson*

The Chicago Area Sigma Xi presented its annual award to Frank R. Hendrickson, M.D. on April 27, 1984. Dr. Hendrickson is a professor at Rush Medical School and chairman of the Therapeutic Radiology Department at Presbyterian St. Luke's Hospital and Principal Investigator at the Fermilab Neutron Therapy Facility. The award was given for significant clinical research in the use of the neutron beam to treat cancerous tumors. The CASX award is made in recognition of scientific excellence contributing to the nation, the state, and to the Chicago area.

## BASKETBALL STANDINGS ANNOUNCED

Standings in the Fermilab Summer Basketball League as of this date are

Team	Win	Loss
Run & Gun	5	0
C.I.A.	3	2
"A" Team	2	3
Bulls	0	5

Scoring leader with a total of 101 points is Tyronne Thomas of the Run & Gun team. Freethrow percentage leader is R. Fonseca of the C.I.A. team - 100% with 2 for 2 attempts in 3 games. Basketball is played on Tuesdays at the Fermilab gym.