

The University of Connecticut

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DEPARTMENT OF PHYSICS NEWS



This is the first presentation of news of the Physics Department at the University of Connecticut in the format of a newsletter. We will touch on several items with the intention of filling in details and attending to other issues at later times. We would like information to travel in both directions. We are asking you, particularly if you have not visited or communicated with the department lately, to give us your news or, better yet, your presence at a function or an occasion of the department.

Our news falls into several categories. These include the Henry S. Katzenstein Endowment in Physics, the Katzenstein Distinguished Lecture in Physics to be given by the Nobelist David Lee, the Commencement Address by David Lee, the Marshall J. Walker Annual Teaching Award, the Schwenk Endowment, recognition of our distinguished emeritus faculty, opportunities for physics in an initiative called UConn 2000, and recent hires and other expansions or improvements in the department. Professor William C. Stwalley joined us from the University of Iowa three years ago and is serving us extraordinarily well as Department Head. His research will be described in a forthcoming newsletter. Finally, we offer an invitation to you.

Goal: \$100K for Katzenstein Endowment in Physics

In the Fall of 1996, Dr. Henry S. Katzenstein established the Katzenstein Endowment in Physics. The first priorities for the income from this fund are to establish a distinguished lectureship and to make permanent the Katzenstein Prize in Physics. This prize has been awarded, since 1991, to the undergraduate writing the best paper in physics. This year's awardee was Ms. Selena Zajac for her paper, "Energy Transfer from Gd^{3+} to Cr^{3+} in Cr doped $Gd_3Sc_2Al_3O_{12}$." The first Katzenstein Distinguished Lecture will be given September 12, 1997 by Cornell's Professor David Lee (M.S., 1955, UConn; Nobel Laureate in Physics, 1996).

Dr. Henry S. and Constance A. Katzenstein reestablished their connection with our department in 1987 and sponsored a reunion of our graduates, including dinner and the Stephen S. Friedland Memorial Lecture, given by Nobel Laureate Nicolaas Bloembergen. In 1990, Dr. Katzenstein, the

University's first Ph.D. in physics, helped us to celebrate the 50th anniversary of graduate studies at the University of Connecticut and gave a well received lecture, "The Physics of the Compact Disc."



The Katzensteins with Nobelist Nicolaas Bloembergen on the occasion of the Friedland Memorial Lecture in 1987

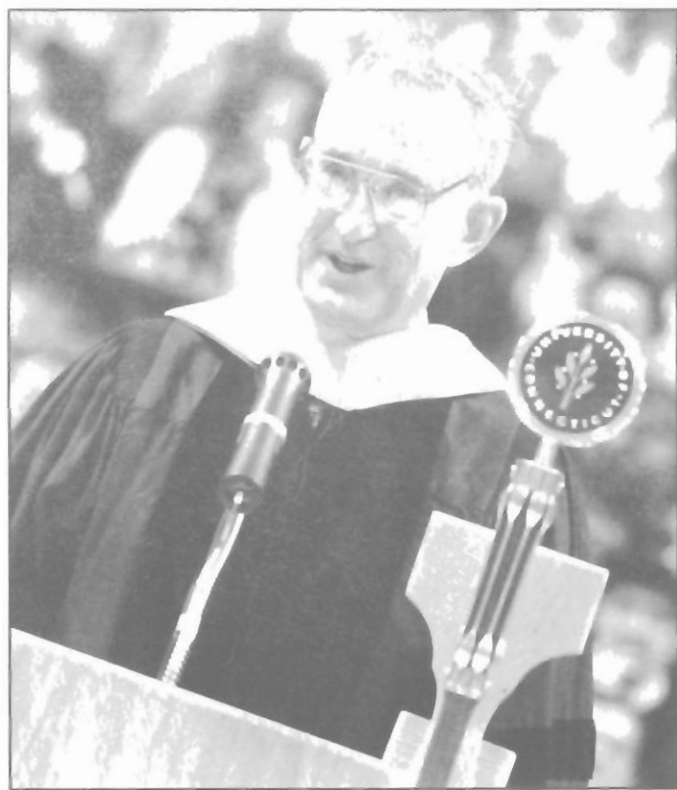
In establishing the Katzenstein Endowment in Physics, Dr. Henry Katzenstein included a clause making additions to his gift possible. His original gift was matched by "UConn 2000," a forward-looking State program to encourage the development of a substantial endowment for the University. Faculty and staff have made contributions and pledges to bring the Katzenstein total to nearly \$90,000. Our goal is to reach \$100,000, and should you be so inclined, checks may be made out to "University of Connecticut Foundation/Katzenstein Fund," and included with your response to this newsletter. Our next newsletter may include a more blatant call for help.

In 1951, Henry S. Katzenstein presented his military discharge papers to the University of Connecticut together with a list of courses taken at Duke and the University of Chicago. Within a year he received his bachelor's and master's degrees from the University of Connecticut and published "The Dissociation of Ethyl-Acetate in the Geiger-Muller Counter," *Phys. Rev.* **84**, 591 (1951). By 1954 he earned the first Ph.D. degree awarded by the Physics Department. His advisor, Professor Stephen Friedland enjoyed substantial funding from the Atomic Energy Commission and the Air Force and their second project

together was the construction of a time-of-flight mass spectrometer, described in *Review of Scientific Instruments* **24**, 11 (1953). His thesis was titled "An Electron Impact Study of Boron Trifluoride with a Time-of-Flight Spectrometer," and his efforts won him a position at MIT's Lincoln Laboratory. It would appear that Connecticut's agricultural heritage also had long-lasting influence. In addition to his holding of a key patent used for reading information from compact discs and his co-founding of Brooktree Corporation, Dr. Katzenstein's greenhouses presently provide a significant fraction of the vegetable seedlings set out on California farms.

In describing Henry Katzenstein, the late department head, Harold P. Knauss, wrote in 1956, "He is outstanding in electronic skill. His interests are deeper than just getting apparatus to work, and even as a graduate student he discussed scientific problems with members of our staff from an unusually mature and critical point of view. He is articulate, friendly, cooperative, and pleasant to have around. He doesn't wait for others to tell him what to do, nor does he take a domineering attitude toward others. I am sure you will like him as a physicist and as a person."

Lee Delivers Commencement Address and Receives Honorary Degree; He will Deliver the First Katzenstein Distinguished Lecture September 12



David Lee presenting the 1997 Commencement address.

David Lee (M.S. UConn, 1955, Ph.D. Yale, 1959) who shared the 1996 Nobel Prize in Physics gave the Commencement Address for the Graduate School ceremonies on May 18th. He received his undergraduate degree from Harvard, served in the military, and then came to Storrs where he completed his Master's Degree. After receiving a Ph.D. from Yale he went to Cornell where he is currently a Professor of Physics. In his address he mentioned that while serving as a corporal of the guard he met a young soldier named Herbert Fried (MS 1952, currently a Professor of Theoretical Physics at Brown University) who had been a graduate student at Storrs studying with Professor Paul Zilsel. A discussion about superfluid ^4He and his parents' move to Connecticut resulted in David Lee's enrollment at UConn where he had a chance to learn about experimental physics. His first project was to build an ionization gauge control circuit for the late Professor Edgar Everhart's Cockcroft-Walton accelerator. He went on to say that while at Storrs he was most influenced by the late

Professor Charles A. Reynolds (a co-discoverer of the isotope effect in superconductors) and by John D. Reppy (MS 1957) a fellow graduate student who is also now a Professor of Physics at Cornell. "It was Professor Reynolds who really excited my interest in superfluidity and low temperature physics" David Lee recalled. In his address, Lee mentioned that the discovery of superfluid ^3He took place over a seven month period 25 years ago. He pointed out that basic science provides long term benefits to society and that many Nobel Prizes result from accidental discoveries. In concluding remarks to the graduating students, Lee stated "What I would say is that it is best to devote your lives to what you believe is important and interesting." Professor Lee will return to Storrs on September 12, 1997 to give the inaugural lecture in the recently endowed Katzenstein Distinguished Lectureship in Physics.

David M. Lee received the 1996 Nobel Prize in Physics for his discovery of superfluidity in ^3He . The Nobel Prize was jointly awarded to Robert C. Richardson, also of Cornell, and Douglas D. Osheroff,

now at Stanford University. The three, working at Cornell in the early 1970's, had to chill their ^3He sample to a temperature of only 2 mK before it transformed into a superfluid, a special liquid state of matter which flows without viscosity. The superfluidity of ^4He is understood as a condensation of weakly interacting bosons. ^3He is a fermion fluid and forms pairs of atoms analogous to the Cooper pairs of electrons in superconductivity. The phase transition in ^3He was discovered almost four decades later and a thousand times lower in temperature than the transition in ^4He . There are other notable distinctions. The constituents, fermion pairs, are magnetic and possess an internal structure. Thus, this superfluid is more complex and has more phases than the other isotope. This is not the place to give a lecture in physics. The real lecture will be given by the appropriate person on September 12. The most important statement we can make here is that you are invited to take part in the event. That will make it a Homecoming of the non-football variety.

Annual Teaching Award named for Professor Marshall J. Walker

Professor Marshall J. Walker would have been pleased to know of the naming of our Outstanding Graduate Teaching Assistant Award in his memory. One of the letters recommending him to the University of Connecticut in 1949 described him as "an exceptionally brilliant young man, very thorough and in my opinion should make an excellent teacher." The University is indebted to this writer for his recognition of Marshall Walker's integrity and potential. Professor Walker served as mentor for generations of undergraduate and graduate students and new faculty members. He was insightful in the assignments he made, from problem assignments for students, to teaching assignments for faculty.

Marshall Walker's route to our department was not the usual one. After a bachelor's in chemistry (1933) and a master's in physics (1936) at Cornell, he joined the E. I. duPont de Nemours Photoproducts Department. During the war he worked on artillery rocket ballistics for the National Bureau of Standards and the Allegany Ballistics Laboratory. He later became a Teaching Fellow in Optics at MIT. He joined the University of Connecticut faculty as an instructor in 1949 and completed the requirements for his Ph.D. degree at Penn State in 1950.



Mrs. Marshall Walker and daughter, Pat admiring the Walker Outstanding Graduate Teaching Assistant Award plaque.

At the University of Connecticut he taught many courses including optics and the nature of scientific thought. He served as acting head of the department from 1962 to 1967 and remained active in teaching and made the teaching assignments until his retirement as professor emeritus in 1977.

UConn 2000 Building Initiative

An exciting development for UConn is the unprecedented UConn 2000 program, which will provide some \$1 billion over ten years, mainly for buildings and renovations. One of the first projects undertaken is the completion of the plaza deck level of physics. It had been left to turn into an unintended wind tunnel and eyesore of wasted space. Now it is a nicely built functional half-floor of our building. It added 4000 square feet for offices, undergraduate majors' study lounge, adjoining seminar rooms, and a sizable departmental computer center, which has grown from 2 to 14 workstations in a few years. Next, the plaza

deck itself will be repaired to remedy water and ice accumulation and consequent leaks. Additional space is contemplated for physics and the Institute of Material Science in that much improved area. Then a biology/physics tower will be erected on the fourth side of the square known as the Gant Science Complex. This is planned to add 20,000 square feet for physics.

As an additional feature of UConn 2000, there is a \$20 million dollar matching endowment fund, in which private dollars raised may be matched by the state. Our own faculty and staff are contributing generously to the new Katzenstein Fund.



The Harold S. Schwenk Fund for Innovative Education in Science

The Harold Schwenk, Jr. family has established a major endowment, matched by UConn 2000 funds, the proceeds of which are to be used for innovative education in science. The Schwenk Family also endowed the Harold S. Schwenk, Sr. Distinguished Chair in Chemistry, in honor of Harold S. Schwenk, Sr. a UConn alumnus and faculty member. Collectively these endowments comprise the largest individual gift ever made to the University of Connecticut. A variety of innovative proposals were submitted for the first year deadline (5/9/97). Those funded included two proposals on internet and multimedia presentation, one on a sonoluminescence laboratory experiment, and one to provide two supplementary summer "Research Experience for Undergraduate" (REU) Fellowships for UConn physics students to participate in our National Science Foundation-supported REU Site in Physics. The current REU program brings ~14 outstanding undergraduates from all over the country to UConn each summer.



Recent Hires, Awards and Promotions

Niloy Dutta, a distinguished semiconductor physicist at AT & T Bell Labs, has recently joined us as Associate Director of the Photonics Research Center, and as Professor of Physics. He will teach an advanced graduate course on the photonics of semiconductors.

In Atomic, Molecular and Optical Physics, we have recently hired an outstanding laser spectroscopist, Ed Eyler, previously a faculty member at the University of Delaware and at Yale.

George Gibson, an ultrafast-laser physicist, won a National Science Foundation Early Career Development Award and the Research Corporation's Cottrell Scholars Award. George will teach a new

course to non-science majors, "The Physics of Music." (Many of us regard what we teach as The Music of Physics.)

Richard Jones has joined our department from CERN. He is carrying out research in nuclear physics at the Thomas Jefferson National Accelerator Facility (formerly known as CEBAF).

Michael Ramsey-Musolf has joined our Department from the Institute for Nuclear Theory at the University of Washington. He also received a NSF Young Investigator Award.

This year, Gayanath Fernando has been promoted to Associate Professor and Phil Gould has been promoted to Professor.

News of Retired Physics Faculty

The ranks of our emeritus faculty began to grow in 1991 with the retirements of Professors Paul G. Klemens, Robert Schor, John Healey (Waterbury Campus), and Leonid V. Azaroff. Paul Klemens, who served as Department Head in the 1960's and early 70's, is internationally known for his work on thermal conduction and phonons. Robert Schor was engaged in studies of statistical aspects of polarizable systems. Lee Azaroff served as founding director of our Institute of Materials Science and is internationally recognized for his books, including one on x-ray spectroscopy. Recently he has published a book on general physics entitled "Physics Over Easy; Breakfasts with Beth and Physics." Beth is Professor Beth Azaroff, a professor of psychology, who recently retired from UMass.

In 1992, Professors Ralph Bartram, Randy Gilliam, Thomas Moran and Arnold Russek retired from the regular faculty ranks. Ralph Bartram served as Department Head from 1986 -1992 and is well known for his work in theoretical solid state physics. Randy Gilliam had a long career in the study of defects and color centers in solids with emphasis on electron spin resonance studies. Tom Moran's work was

dedicated to spectroscopy of beam generated molecular species. Arnie Russek's widely respected work in atomic theory was closely linked to the experimental programs within the department and to the atomic physics community at large. Prof. Fred Steigert, an experimental nuclear physicist, long associated with our undergraduate honors seminar, retired in 1994. Prof. Fred Otter, active in scanning-tunneling microscopy and materials modification by ion implantation, joined us as a half-time professor after leaving the United Technologies Research Center, and retired in 1994. Prof. Fred Lipschultz, a low temperature experimentalist, took early retirement in 1996 and continues to work in experimental physics at the University of San Francisco. We note with sadness, the passing of Professors Harold Knauss, Chuck Reynolds, Ed Everhart and Marshall Walker, early stalwarts of our department.

All of these emeriti will be missed, not only because of their research interests, but because of their overall personal qualities and dedication to the teaching and research missions and well-being of our University.

The Department of Physics welcomes your communications! Our phone numbers (Storrs area code 860) and e-mail addresses are listed below. Our *mailing address* is: Department of Physics, University of Connecticut, 2152 Hillside Road, Storrs, CT 06269-3046. The *Main Office* phone number is: (860) 486-4915. Our *web site address* is: <http://www.physics.uconn.edu>.

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Please, take a moment to provide the department with the following information. If our newsletter effort is to be successful, it is imperative that we develop an accurate mailing list. Our next letter will include a list of respondents to this letter, so that you may help us search for those graduates we have lost track of.

Name:

Preferred Address (if other than what we have used for this letter):

Phone number:

MARK YOUR CALENDAR: On September 12, 1997, at 4:00 p.m. our Nobel Laureate, David Lee (M.S., 1955) will present the first Henry Katzenstein Distinguished Lecture in Physics. This will take place in the Physics Building of the University of Connecticut in Storrs and be followed by dinner.

- ☐ I am interested in attending the September 12, Henry Katzenstein Distinguished Lecture.
- ☐ I would not mind being asked to contribute to the Katzenstein Endowment Fund to aid the Physics Department in its quest for excellence.

Please return this form to:

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(Folding both ends of this sheet in will turn the response form into a mailer.)



Any news or suggestions for our next newsletter?

David Markowitz, Editor
at Department address



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