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## NEWS AND NOTES 1994, VOL.5, NO.10

The Rockefeller University

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# news & notes

November 18, 1994 Volume 5, Number 10

The Rockefeller University

## Board promotes three to associate professor; elects trustee, appoints new chair of scientific affairs

Three assistant professors and heads of lab—Titia de Lange, Magda Konarska, and Michel Nussenzweig—were promoted to associate professor at the fall meeting of the Board of Trustees Wed., Nov. 16.

The trustees also elected a new trustee, Richard B. Fisher, president and chairman of Morgan Stanley & Co., and appointed trustee Philip Leder, chairman of the Harvard Medical School's department of genetics, to serve as chair of the board's scientific affairs committee.

Regarding the promotions, President Torsten Wiesel said, "These three investigators have consistently demonstrated scientific rigor and originality in their research. I congratulate them on their well-earned promotions."

### de Lange

de Lange studies telomeres, which are specialized nucleoprotein complexes that cap the ends of linear chromosomes, protecting and stabilizing them. In normal human

cells, telomeres are gradually lost with each cell division, although an enzyme called telomerase protects them in immortal cells. de Lange is studying the role of telomeres and telomerase in human cancer, and is working to isolate and clone telomere components from human cells.

de Lange earned her doctorate at the University of Amsterdam and the Netherlands Cancer Institute in 1985. She was a postdoctoral fellow

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Titia de Lange (left), Magda Konarska, and Michel Nussenzweig were promoted to associate professor.

## Neurologist Kathleen Foley to address Cohn Forum

Kathleen Foley, chief of Memorial Sloan-Kettering Cancer Center's Pain Service, will speak at the Zankvil A. Cohn Forum on Health Affairs, Tues., Nov. 29. Her topic is "Transforming the Culture of

Dying in America."

"Kathleen Foley is on the front line of pain management. As a clinician, she is concerned with both hospital and hospice care. As a researcher, she is someone whose work is internationally known and respected," said Alexander Bearn, chair of the forum's program committee. President Torsten Wiesel will introduce Foley at the forum.

Foley received her M.D. from Cornell University Medical College in 1969. She pursued postdoctoral training at the New York Hospital, first as an intern in medicine, then as a fellow in genetics, and then as a resident in neurology. While remaining affiliated with the New York Hospital, she began her career at Memorial Sloan-Kettering as an assistant attending neurologist in the neurology department

(from 1974-1979) and a special fellow in neurooncology (from 1975-1978). She became associate attending neurologist in 1979, and chief of the pain service in 1982. She is also an attending neurologist, professor of neurology and neuroscience, and professor of clinical pharmacology.

Certified by the American Board of Psychiatry and Neurology in 1977, Foley has contributed to many scientific organizations, including a chronic pain management committee of the American Medical Association, a commission on disability and pain of the Department of Health and Human Services, a committee on end-of-life care of the Institute of Medicine, and various committees

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## RU investigator to lecture on obesity genes

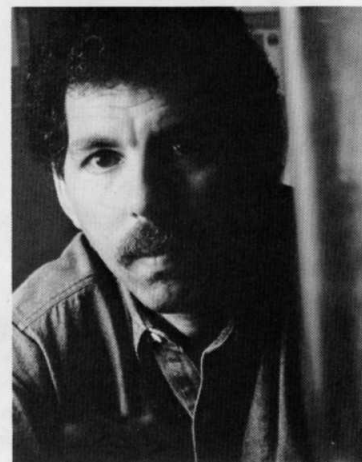
Associate Professor Jeffrey Friedman will speak on "Lipostasis and the Control of Body Weight: Molecular Cloning of Obesity Genes" at the Friday lecture today (Nov. 18).

Friedman, an associate investigator of the Howard Hughes Medical Institute, studies the control of body weight and the genes that play a role in balancing energy intake and expenditure. Today he will discuss his attempts to isolate, through the technique of positional cloning, two mutant genes that cause obesity in mice: obese (*ob*) and diabetes (*db*). Information from these studies is also being used to characterize human pedigrees and identify possible human counterparts of these mouse genes.

"Jeff is taking an important first step in understanding the genetics of obesity in mice," said Vincent Astor Professor James E. Darnell, who will introduce Friedman today. "This work holds important ramifications in humans as well."

Friedman received an M.D. from Albany Medical College of Union University in Albany, New York in 1977. After completing his internship and residencies at the Albany Medical Center Hospital in 1980,

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Associate Professor Jeffrey Friedman lectures today (Nov. 18).

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## Promotions and other news from the Board

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at the University of California, San Francisco, working with Harold Varmus, and came to Rockefeller in 1990 as assistant professor and head of lab. de Lange received two scientific awards in The Netherlands, a Lucille P. Markey Trust Scholar Award, and an Irma T. Hirsch Trust Award.

### Konarska

Konarska studies functions of RNA molecules, concentrating on mRNA splicing and hepatitis delta virus (HDV) replication. Through the development of an in vitro system, Konarska is defining fundamental interactions within the spliceosome complex, where splicing of nuclear pre-mRNA is carried out. In addition, studies of the replication of HDV RNA by mammalian RNA polymerase II are being pursued to uncover possible relationships between RNA replication and the evolutionary origins of RNA- and DNA- dependent polymerases.

Konarska earned a Ph.D. at the Polish Academy of Sciences in 1983 and was a postdoctoral fellow at the M.I.T. Center for Cancer Research, working with Phillip A. Sharp. She came to Rockefeller in 1989 as assistant professor and head of lab. Konarska received several awards from the Polish Academy of Sciences while pursuing her doctorate. In America, she has received a Monique Weill-Caulier Career Scientist Award and a Lucille P. Markey Trust Scholar Award.

### Nussenzweig

Nussenzweig studies the immune system. He is particularly interested in understanding the development and regulation of B lymphocytes, which are antibody-secreting cells. Among his lab's primary goals is to learn in detail how the B cell's immunoglobulin receptor functions to regulate both antibody production and B cell development.

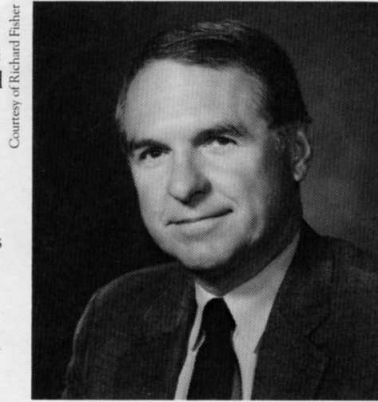
Nussenzweig earned a doctorate from RU in 1981; in 1982, he completed an M.D. at New York University. He was an intern, a resident in medicine, and a clinical fellow in infectious diseases at the Massachusetts General Hospital. His was a postdoc in genetics with Philip Leder at Harvard. He came to Rockefeller in 1989 as assistant professor and head of lab. In 1990, he was appointed assistant investigator in the Howard Hughes Medical Institute.

### New trustee

Fisher, the new Rockefeller trustee, is president and chairman of Morgan Stanley & Co. He serves as chair of the Princeton University Investment Company and is a trustee of Bard College, the Urban Institute, Historic Hudson Valley, and chair of the Brooklyn Academy of Music Endowment Trusts. He is a member of the Board of the New York Stock Exchange.

### New chair

Leder, the new chair of Rockefeller trustees' scientific affairs committee, is John Emory Andrus Professor of Genetics at



Richard Fisher, president and chairman of Morgan Stanley & Co., is a new RU trustee.

Harvard. He was elected a Rockefeller trustee in 1988. A member of the National Academy of Sciences and the Institute of Medicine, Leder received an Albert Lasker Basic Medical Research Award in 1987 for his demonstration in transgenic mice that deregulation of normal genes can lead to cancer. In 1989, he received the National Medal of Science.

Leder replaces Roy Vogel, who has resigned and is now chair of the University of Pennsylvania board of trustees.

## Friedman

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Friedman came to Rockefeller as an associate physician and postgraduate fellow, and served as a postgraduate fellow at Cornell University Medical College until 1981. In 1986, he received a Ph.D. from Rockefeller and was named assistant professor. That year he was also appointed assistant investigator of the H.H.M.I. He was promoted to associate professor and head of lab in 1991.

A member of the New York Academy of Sciences, Friedman has been the recipient of many awards and honors, including the Alfred Yunich Prize from Albany Medical College and the Cornell Scholars Award. He is chairman of the Committee for Mapping Mouse Chromosome 4 and is a member of the American College of Physicians.

The lecture will be held in Caspary Auditorium at 3:45 P.M. and preceded by tea at 3:15 P.M. in Abby Aldrich Rockefeller Lounge. All are welcome to attend.

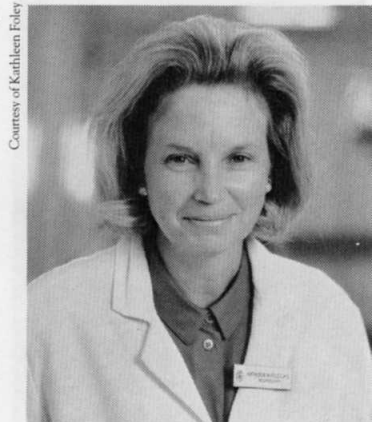
## Foley

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of the National Cancer Institute and World Health Organization. She has received honors and awards from the Institute of Medicine, the American Cancer Society, and many universities and cancer research societies. At present, she is also director of the Open Society Institute's Project on Death in America.

The forum on health affairs was established by the late Zanvil A. Cohn as a venue for informal discussion on important issues in health research and public policy.

The forum, which will take place the Tuesday after the Thanksgiving holiday, begins at 5:30 P.M. in the Abby Aldrich Rockefeller Dining Room. Sherry will be served at 5:00 P.M. All are welcome.



Kathleen Foley, an international authority on pain management, will lecture at the Cohn Forum Tues., Nov. 29.



Toyota Professor Mitchell Feigenbaum chats with Robert Austin, a physicist from Princeton University (left), before last Tuesday's Center for Studies in Physics and Biology Seminar. The seminar series offers an exchange of ideas across disciplines. Nobel laureate T.D. Lee, from Columbia University, will speak at the next seminar, to take place Tues., Nov. 22 at 4:00 P.M. in Smith Hall Annex B-level Conference Room. The lectures are preceded by tea at 3:15 P.M.

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# Of snowflakes and sinews: Investigator links physics and biology

by Susan Blum

Relating physics to biology, the past to the future, and the poetry of texts to the precision of mathematics, Rockefeller Professor Albert Libchaber spoke on "Physics and Biology: The Universal and the Specific" as part of the recent ceremonies inaugurating Rockefeller's Center for Studies in Physics and Biology.

Physicists at the new center are considering key questions about the dynamics of biologically important molecules and the complexities of the human brain and visual systems. As Libchaber's talk illustrated, studies of complex and dynamic systems have a long and distinguished history in scientific research, though the mathematics and the mechanisms used in those studies have evolved considerably over the centuries.

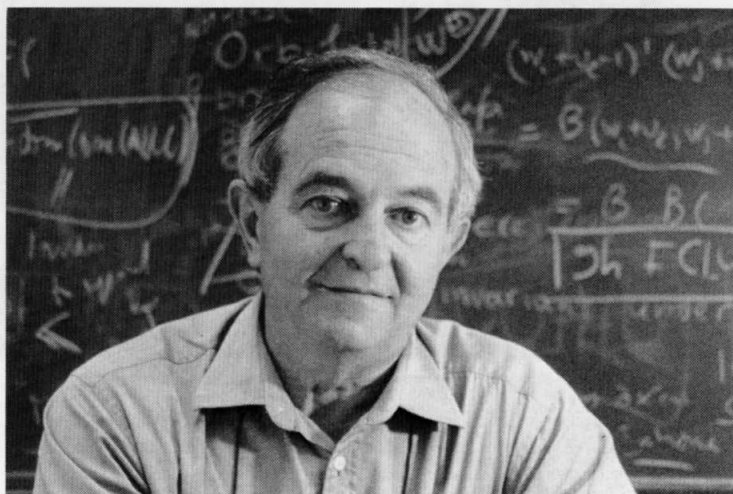
## A meeting of fields

"One place physics and biology can meet is in nonequilibrium phenomena," Libchaber explained in his talk, and in a later interview with *News&Notes*. Nonequilibrium phenomena are those that are subject to an outside energy flux—such as a flux of heat or photons—rather than those that occur in closed systems, the more typical subject of investigations in physics.

Nonequilibrium physics is usually nonlinear, as well—meaning that the response of the system is not proportional to the action upon it. Such physics is much more complicated to analyze, and much less advanced, than the physics of closed systems, Libchaber said. But it is vitally important to biology, because "basically, non-equilibrium systems are what biology is all about. There is always a flux of energy in biological systems. If you stop the flux of energy, the system dies."

The dynamic forms and patterns found in living organisms—and in many other natural phenomena, such as the ever-changing patterns of weather, the undulations of the seas, and the motion of the earth's tectonic plates—emerge out of the flux that is the subject of nonequilibrium physics. In Libchaber's view, studies of "how organization complexifies itself" began with Johannes Kepler's little book, *On The Six-Cornered Snowflake*, published in 1611 and full, Libchaber said, of "poetry, humor, and science."

The volume, a mere 25 pages long, was written as a New Year's



Rockefeller Professor Albert Libchaber, a pioneer in the study of non-linear dynamics, is interested in the physical forces basic to the life processes of cells.

gift for Kepler's patron, Johann Matthäus Wacker. In the beginning, Kepler assured his sponsor, "I am well aware of how fond you are of nothing" and then deemed the snowflake—"smaller than any drop, yet with a pattern"—to be "the ideal New Year's gift for the devotee of nothing."

But in this epitome of nothing Kepler saw a whole world, Libchaber said. Trying to explain the six-sided symmetry of each snowflake, Kepler showed that such symmetry derives from the organization of the atoms from which it is constructed. "It is a wonderful presentation of early solid state physics, and of how symmetry at the atomic level can lead to macroscopic symmetry and delicate shapes," Libchaber said.

## Instability and complexity

Kepler's work was the first to investigate "how instability of growth leads to complex patterns," Libchaber said, but the first mathematical theory of nonlinear phenomena emerged only in 1892, with the publication of two books—*Nouvelle Méthode de la Mécanique Céleste*, by Raymond Poincaré and *On the Stability of Motion*, by Aleksandr Lyapunov—which "changed the way one understands nonlinear dynamics." Upon such mathematical work did Mitchell Feigenbaum (the director of Rockefeller's Center for Physics and Biology), Libchaber, and others build in the 1970s, advancing the study of nonlinear dynamics.

Libchaber, an experimental physicist, described research he

conducted around 1980 that was "in the flavor" of Kepler's study of snowflakes. Like Kepler's, his work, too, played with crystals, "but instead of taking atoms, I took gas, and the convection of gas"—that is, the swirling motion of gas in response to a flux of heat.

Using motion pictures of his experiment to illustrate his points, Libchaber explained how convection organizes itself into patterns of ever-greater complexity as the heat flux increases. Among those patterns is a "crystal of rolls" that forms as hot and cold currents of gas pass one another by. "It's a game I play with gas, on which I create order by imposing a flux of heat, and with this flux of heat, and nothing else, an organization appears," Libchaber said.

Today, Libchaber's experiments include investigations of the complex organizations that appear in biological systems. Such an approach is not new, Libchaber said. "The nonlinear approach to biology started, I suspect, with D'Arcy Wentworth Thompson, who wrote a beautiful book in 1917 called *On Growth and Form*." In that book, Thompson wrote, "we want to see how, in some cases at least, the forms of living things can be explained by physical considerations, and to realize that, in general, no organic forms exist save such as are in conformity with physical and mathematical laws."

## Muscles and motion

In Libchaber's lab, physicists are investigating what he calls "a sim-

ple case" of how physics and mathematics relate to biology, by modeling the interactions between actin and myosin that lead to muscle motion. To do so, they create a "forest of myosin" on a glass plate, over which actin filaments, tagged with fluorescent markers, can flow. Through the use of high-tech microscopes and computer-enhanced imaging, the scientists end up with "a problem that is essentially like a physics problem for us," Libchaber said.

Specifically, it is a problem of transport in two-dimensional physics. In more typical studies of 2-D transport, physicists follow the flow of electrons or atoms and the defects in such transport, which always take the form of swirling, rotating vortices. Remarkably, however, Libchaber and his colleagues found that "the actin filaments were following the very general rules of two-dimensional transport with vortices."

Thus, said Libchaber, "Without doing anything special, we can measure the force [of the motion of actin on myosin] by measuring the rotation [of the vortices]. It's a way to make direct measurements of the force, which has application for muscle function. More generally, for a problem like this we can write a transport equation and try to analyze the motion and the dynamics of the flow."

## Just science

Summing up, Libchaber said, "In a way, for me it's meaningless to talk about physics or to talk about biology. We are just doing science. As an experimentalist, when I work on actin and myosin, I have to learn how to make a buffer, how to purify protein. But after that, it's a problem that is no different from problems I have worked on for a long time."

Those problems—like many others pursued by physicists here at Rockefeller—are yielding techniques (such as high-tech microscopy and computer imaging) that physicists believe hold great promise for biological investigations. In addition, the approach of physicists—which Libchaber termed "a more global, general approach"—is providing new avenues for exploration of the patterns, organization, and complexity found within living organisms.

## Ceremony celebrates employee anniversaries at RU

More than five dozen members of the Rockefeller community who have served the university for 10 and 20 years were honored at the Employee Recognition Program Thurs., Nov. 10, held in the Abby Aldrich Rockefeller Dining Room.

Addressing those assembled at the afternoon event, President Torsten Wiesel said, "This is a celebration we all relish. It is a chance for the university to express its thanks to everyone who helps to make this a great place."

Wiesel paid tribute to each honoree, and invited them to the podium to receive gifts, which were presented by Eileen Holloran, associate director of personnel. Holloran was one of the founders of the program, which was first held in 1985; it has been an annual event run by the personnel office ever since. Those celebrating 10 years received silver Tiffany's key chains, engraved with the seal of the uni-



At the Employee Recognition Program, honorees celebrated with friends. Shown are (standing, from left): Mary Brust, Joan Hofman, Elizabeth Hayes, Irma Cardinale, Ina Leong, and Toyoko Kikuchi. Seated are (from left) Teresa Sanocki and Henrietta Carbonaro.

versity. People commemorating twentieth anniversaries received crystal bowls, also engraved with the seal.

After the ceremony, refresh-

ments and hors d'oeuvres were served. "It was a really nice affair," said Isaiah Curry, of laboratory safety, who celebrated his twentieth anniversary.

### Ralph W.G. Wyckoff (1897-1994)

Ralph W.G. Wyckoff, a member of The Rockefeller Institute for Medical Research from 1926 to 1938, died last week at the age of 97.

Wyckoff was a pioneer in the use of X-ray crystallography. While a member of the institute, he studied the structure of amino acids, laying the foundation for future studies on the structure of proteins.

He also developed a method for the ultracentrifugal purification of viruses that led to the isolation of rabbit papilloma virus, the first animal virus to be purified in appreciable amounts.

## Potpourri

**Tri-Institutional Noon Recital** Cellist Jan-Erik Gustafsson will perform the works of Beethoven, Salonen, and Chopin at the Tri-Institutional Noon Recital today (Nov. 18). Gustafsson, winner of the 1994 Young Concert Artists International Auditions (New York), will be accompanied by pianist Heini Kärkkäinen, a soloist with the Helsinki Philharmonic. The concert, to be held in Caspary at noon, is free. All are welcome.



Cellist Jan-Erik Gustafsson will perform at the Tri-Institutional Noon Recital today (Nov. 18).

### Friday film

*The Misfits* (U.S.A., 1961), directed by John Huston, will be shown

today (Nov. 18) at 8:00 P.M. in Caspary Auditorium. The film, starring Montgomery Clift, Clark Gable, and Marilyn Monroe, revolves around three jobless cowboys and the woman who keeps house for them. Admission is free.

### Retirement savings

A representative from TIAA-CREF will be on campus Tues., Nov. 29 to discuss the supplemental retirement annuity (S.R.A.). The S.R.A. allows employees to make pretax contributions to retirement savings through a salary reduction agreement. Two sessions will be held in Nurses Residence 110B: 10:30 A.M. to 11:30 A.M. and noon to 1:00 P.M. For further information, please contact Ginny Hansen, x8299, or Kristin Gross, x8297.

### Clinical Research Seminar

Professor Emil C. Gotschlich will speak on "The Genetics of Gonococcal LPS Synthesis" at the Clinical Research Seminar Wed., Nov. 30 at noon in Nurses Residence 110B.

### Book sale & Sweat shirt shop

A book sale to benefit The Rockefeller University Children's School and Infant-Toddler Center will be held Thurs., Dec. 1 from

8:30 A.M. to 3:30 P.M. in the Tower lobby.

The sweat shirt shop, located in Rockefeller Research Building 133, has new inventory: more styles and colors of favorite sweat shirt shop items and new items for sale. Hours are Tuesdays, from 11:30 A.M. to 1:30 P.M. Proceeds benefit the Children's School.

### Children's School Applications

The Rockefeller University Children's School and Infant-Toddler Center (I.T.C.) are accepting applications for the academic year beginning Sept. 1995 for children from three months to five years old. In addition, the I.T.C. currently has three openings for infants (3 to 12 months old) for this academic year. For further information, contact Marjorie Goldsmith, x8580.

### Holiday bazaar

The Lenox Hill Neighborhood House, 331 East 70th Street, will hold its Seventh Annual Old Fashioned Holiday Bazaar Thurs., Dec. 1 and Fri., Dec. 2, from 11:00 A.M. to 8:00 P.M. The bazaar will feature a flea market, gift boutique, gourmet items, holiday decorations, and a silent auction. For further information, call 744-5022, extension 355. Admission is free.

### Concert

Tickets are still available for Kathleen Battle's performance Thurs., Dec. 8 at 8:00 P.M. in Caspary. Ticket information and order forms can be obtained by fax from Cathy Rogers, x7876. No phone reservations will be accepted.

### Arrivals

**Postdoctoral Fellows:** Mary Felber, McEwen lab; Eric Honore, Hemmati-Brivanlou lab; Ronaldo Quaggio, Chua lab; Shinya Tanaka, Hanafusa lab; Jun Zhang, Libhaber lab.

**Guest Investigators:** Steven Auerbach, Friedman lab; Robert Staudinger, Kappas lab.

### Departures

**Visiting Associate Professor:** Paul van Bergen en Henegouwen, Hanafusa lab.

**Adjunct Faculty:** Barbara Levine, Hirsch lab.

**Postdoctoral Associates:** William Chen, Darnell lab; Glen Scholz, Hanafusa lab.

**Postdoctoral Fellow:** James Chou, Kreek lab.

**Guest Investigator:** Pedro Persechini, Ding-E Young lab.

### News&Notes schedule

*News&Notes* will not be published next week due to Thanksgiving.