

1-1-1986

## Distinguished Scientist Lecture Series Program 1986-1987

Bard College

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# Distinguished Scientist Lecture Series



1986-87

Sponsored by the  
Bard College Center  
with support from the National Patent Development Corporation

# Distinguished Scientist Lecture Series

The 1986-1987 series comprises seven lectures by some of the most eminent scientists of our time, including four Nobel laureates and one Fields medalist. In addition to the lecture, each program includes a seminar for science scholars and others to further explore the life's work of the day's speaker.

## *Schedule of Lectures*

October 11, 1986

*David Hunter Hubel*

"The Visual Pathways and Perception:  
Evidence for Distinct Subsystems in Vision"

October 25, 1986

*Subrahmanyan Chandrasekhar*

"On Gravitational Collapse, Black Holes,  
and Colliding Waves"

November 15, 1986

*John Willard Milnor*

"Some Simple Dynamical Systems"

December 13, 1986

*Marian Koshland*

"The Immune System: A Model for  
Studying Differentiation"

February 21, 1987

*Joseph L. Goldstein, M.D.*

"Toward a Molecular Understanding of  
Cholesterol and Atherosclerosis"

March 7, 1987

*William A. Fowler*

"The Quest for the Origin of the Elements"

April 25, 1987

*Richard Axel*

Title to be announced

## *Bard College*

Bard College is a coeducational college of the liberal arts and sciences, founded in 1860. It is located on a 600-acre wooded campus that borders the Hudson River in rural Dutchess County, New York, approximately 100 miles north of New York City.

The College is organized into four academic Divisions: Social Studies; Languages and Literature; The Arts; and Natural Sciences and Mathematics; and also offers a Master of Fine Arts degree in the Milton Avery Graduate School of the Arts. Academic facilities include the Hoffman Memorial and Kellogg Libraries and the Milton and Sally Avery Center for the Arts.

In 1979, Bard assumed ownership of Simon's Rock, an "early college" located in Great Barrington, Massachusetts, which offers a college education in fully accredited degree programs to high school age students. This step gave Bard an exceptional opportunity to apply its experience as a 126-year-old liberal arts college to the development of a strong liberal arts curriculum for younger students. Both Bard and Simon's Rock remain distinct and carry on quite separate academic programs at their respective campuses.

In 1986 the Board of Trustees established the Jerome Levy Economics Institute as an autonomous unit of the College. The Institute will conduct independent, nonpartisan economic research and educational programs.

## *The Bard College Center*

Established in 1978 as the "public arm" of the College, the Bard Center was recently described by the Rockefeller Foundation's Report of the Commission on the Humanities as "a model of mobilizing the resources of the college and the community." Through workshops, national conferences, small group seminars, lecture series, summer institutes, publications, and exhibitions at the Edith C. Blum Art Institute, the Bard Center explores the emerging issues of today in the sciences, arts, humanities, and education—to the benefit of the Bard community, the Hudson Valley region, and educators and policy makers around the country. The Institute for Writing and Thinking, part of the Bard Center, has been recognized as one of the leading institutes for the instruction and methodology of writing. The Center's varied efforts are complemented by the work of Bard Center Fellows, who are distinguished artists, scientists, scholars, and writers appointed annually to serve as a "public faculty."

## *David Hunter Hubel, Neurophysiologist*

Dr. Hubel, a Nobel laureate, is John Franklin Enders University Professor in the Department of Neurobiology at Harvard University. He is also a senior fellow in the Harvard Society of Fellows and an associate of Leverett House, Harvard.

Born in Windsor, Ontario, Dr. Hubel received the B.Sc. and the M.D. from McGill University and Medical School. He completed his residency at Montreal Neurological Institute, where he was a fellow in electroencephalography. Recognition for his work has included Harvard's Ledlie Prize, the Horwitz Prize of Columbia University, the Friedenwald Award, honorary degrees from Harvard, McGill, and the University of Manitoba. He has given named lectureships at the University of Pennsylvania, Cambridge University, Princeton University, Harvard University, the Weizmann Institute of Science, and others. In 1981 he received the Nobel Prize in Medicine or Physiology with Torsten Weisel for "information processing in the visual system."

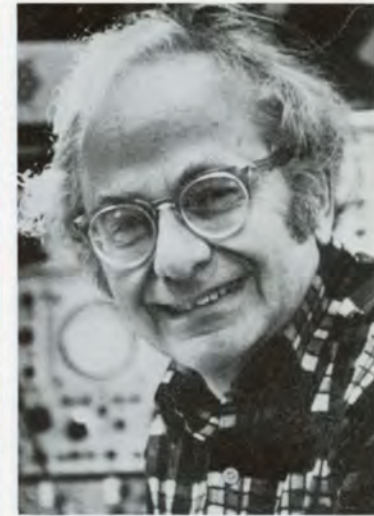
Dr. Hubel is a member of the Royal Society (London), the National Academy of Sciences, the American Philosophical Society, the American Physiological Society, and the American Academy of Arts and Sciences, among others.

### **His Work**

Dr. Hubel's research has focused on the neurophysiology and neuroanatomy of the visual systems of higher mammals.

### **His Lecture**

October 11, 1986: "The Visual Pathways and Perception: Evidence for Distinct Subsystems in Vision"





## *Subrahmanyan Chandrasekhar, Astrophysicist*

A Nobel laureate, Dr. Chandrasekhar was born in Lahore, India, and is currently Distinguished Service Professor at the Yerkes Observatory of the University of Chicago.

After receiving the B.A. from the University of Madras, Dr. Chandrasekhar attended Cambridge University, where he earned the Ph.D. degree in theoretical physics and the Sc.D. degree in astrophysics. He taught at Trinity College, Cambridge, until 1945, when he was appointed to the Yerkes Observatory.

It has been said that Dr. Chandrasekhar's research has "made black holes possible." In 1983, he was awarded the Nobel Prize for his important theoretical studies of the physical processes in the structure and evolution of stars. Among his other awards, Dr. Chandrasekhar has received the Gold Medal of the Royal Astronomical Society, the National Medal of Science, and the Heinemann Prize of the American Physical Society.

A member of the National Academy of Sciences and the American Academy of Arts and Sciences, Dr. Chandrasekhar has contributed to a number of scientific journals and was editor of *Astrophysics* from 1952 to 1971.

Dr. Chandrasekhar has done research into the internal constitution of stars, white dwarfs, dynamics of stellar systems, theory of stellar atmospheres, radiative transfer, hydrodynamics and hydromagnetics, and general relativity.

October 25, 1986: "On Gravitational Collapse, Black Holes, and Colliding Waves"



## *John Willard Milnor, Mathematician*

Dr. Milnor holds the Veblen Chair at the Institute for Advanced Study, of which he has been a member since 1963.

Born in Orange, New Jersey, Dr. Milnor received the A.B. and the Ph.D. degrees from Princeton University, where he taught—as Higgins Lecturer, Henry Putnam University Professor, and chairman of the department—until 1966. He has been Alfred P. Sloan Fellow and visiting professor at the University of California, Berkeley, visiting professor at the University of California, Los Angeles; and professor of mathematics at Massachusetts Institute of Technology. Honors for his work have included the Fields Medal awarded by the International Mathematical Union in 1962, the National Medal of Science awarded in 1966, the Steele Prize awarded by the American Mathematical Society in 1982, and honorary degrees from Syracuse University and the University of Chicago, among others.

Dr. Milnor is a member of the National Academy of Sciences, the American Mathematical Society, and the American Philosophical Society. He has been associated with the Institute for Advanced Study since 1963, when he became a long-term member. He has published in the *Journal of Differential Geometry*, *American Mathematical Monthly*, and the *Bulletin of the American Mathematical Society*, among other periodicals.

### **His Work**

Dr. Milnor's research has concentrated on differential topology, especially the topology of manifolds; differential geometry; and dynamical systems.

### **His Lecture**

November 15, 1986: "Some Simple Dynamical Systems"



### *Marian Koshland, Immunologist*

Dr. Koshland is professor of bacteriology and immunology at the University of California at Berkeley. Born in New Haven, Connecticut, she received the B.A. degree from Vassar College and the Ph.D. degree from the University of Chicago.

Dr. Koshland began her professional career by working at the Office of Scientific Research and Development in Chicago and, during World War II, on the Atomic Bomb Project, Manhattan District, in Tennessee. She has also done research at Brookhaven National Laboratory, where she was bacteriologist until 1965. In addition to her position at the University of California, Dr. Koshland has recently been a fellow in bacteriology and immunology at Harvard University and a member of the executive committee of the National Science Board, National Science Foundation. In 1975 she served on the President's Biomedical Research Panel in immunology and microbiology. She is currently a member of the National Academy of Sciences, the American Academy of Microbiologists, and the American Association of Immunologists (where she served as president in 1982-83), among others.

#### **Her Work**

Dr. Koshland's research has focused on the mechanism of antibody synthesis, including the roles of J chain and IgM in the differentiation of antibody-forming cells; and on the genetic control of J and heavy chain synthesis.

#### **Her Lecture**

December 13, 1986: "The Immune System: A Model for Studying Differentiation"

### *Joseph L. Goldstein, Biochemist*

Dr. Goldstein, a Nobel laureate, is Regental Professor, professor of internal medicine, and chairman of the Department of Molecular Genetics for the Health Science Center of the University of Texas. Born in Sumter, South Carolina, he received the B.S. degree from Washington and Lee University and the M.D. degree from the University of Texas Southwestern Medical School and did his residency at Massachusetts General Hospital. In addition to his research, he continues to practice at Parkland Memorial Hospital as senior attending physician.

Among Dr. Goldstein's many awards are the Pfizer Award for Enzyme Chemistry of the American Chemical Society, the New York Academy of Sciences Award in Biological and Medical Sciences, the Albert D. Lasker Award in Basic Medical Research, the American College of Physicians Award, and the Lita Annanberg Hazen Award. In 1985, he received the Nobel Prize in Physiology or Medicine, with Michael S. Brown, for their work in genetics, which has led to a better understanding of lipoprotein accumulation and atherosclerosis.

Dr. Goldstein is a member of the National Academy of Sciences, the American Academy of Arts and Sciences, and the American College of Physicians. He currently serves as president of the American Society for Clinical Investigation and is a member of the Medical Advisory Board of the Howard Hughes Medical Institute. He is also a member of numerous boards of professional journals, including *Science*, *Cell*, *Journal of Biological Chemistry*, and *Molecular Biology and Medicine*; he is the co-editor of *The Metabolic Basis of Inherited Disease*. In 1982 he received an honorary doctorate from the University of Chicago.

#### **His Work**

Dr. Goldstein's research has been in the areas of human biochemical genetics, the regulation of cholesterol and lipoprotein metabolism, and membrane receptors.

#### **His Lecture**

February 21, 1987: "Toward a Molecular Understanding of Cholesterol and Atherosclerosis"





### *William A. Fowler, Astrophysicist*

A Nobel laureate, Dr. Fowler is Institute Professor of Physics *emeritus* at California Institute of Technology. Born in Pittsburgh, Pennsylvania, Dr. Fowler received the Ph.D. degree in physics from the California Institute of Technology with a dissertation on "Radioactive Elements of Low Atomic Number." He taught at the California Institute of Technology from 1936-1982, and held numerous named lectureships, including a Fulbright lectureship at Cambridge University.

Dr. Fowler has been a Guggenheim Fellow and a recipient of the USA Medal for Merit, the NASA Apollo Achievement Award, the National Medal of Science, and the Tom W. Bonner Prize of the American Physical Society. He has received numerous honorary degrees, most recently from Georgetown University (1986). In 1983 he was awarded the Nobel Prize for Physics for "theoretical and experimental studies of the nuclear reactions of importance in the formation of the chemical elements in the universe."

Dr. Fowler has had a long history of service to the scientific community. He has chaired the Physics Section of NAS, the Nuclear Science Advisory Committee of the National Science Foundation, and the Office of Physical Sciences, AMPS; he has served as president of the American Physical Society and is a founding member of the Planetary Society and the Society for Scientific Exploration.

#### **His Work**

Dr. Fowler's research has been in nuclear forces and reaction rates; nuclear spectroscopy; the structure of light nuclei; nuclear astrophysics, thermonuclear sources of stellar energy and element synthesis in stars and supernovae; supernova models; isotopic anomalies in meteorites and the origin of the solar system; nucleocosmochronology; and the study of general relativistic effects in quasar and pulsar models.

#### **His Lecture**

March 7, 1987: "The Quest for the Origin of the Elements"

### *Richard Axel, Molecular Biologist*

Dr. Axel is professor in the Department of Pathology and Biochemistry at Columbia University.

Born in Brooklyn, New York, Dr. Axel received the A.B. degree from Columbia University and the M.D. degree from Johns Hopkins School of Medicine. He interned in pathology at the Columbia College of Physicians and Surgeons in 1970-71. He held positions as a fellow in pathology and oncology at the Institute for Cancer Research; as a visiting fellow in the Department of Pathology of Columbia University. Until recently he was acting director of the Institute of Cancer Research, in addition to his professorial position.

Dr. Axel has received the Young Scientist Award of the Passano Foundation, the Alan T. Waterman Award, and the Eli Lilly Award. Since 1976 he has been associate editor of *Cell* magazine. He is a member of the National Academy of Sciences and the American Academy of Arts and Sciences, and is a contributor to several professional journals.

#### **His Work**

Dr. Axel's work has focused on the control of gene expression in normal and transformed cells.

Dr. Axel has developed procedures which permit the introduction of any gene into animal cells. This work has permitted the analysis of gene function by "surrogate" genetics and provides a rationale for gene therapy. More recently he has identified genes which mediate complex behaviors in simple organisms.

#### **His Lecture**

April 25, 1987: title to be announced





### *Director of the Series*

Dr. Abe Gelbart, mathematician, is a Bard College Center Fellow, dean emeritus of the Belfer Graduate School of Science at Yeshiva University, and the David and Rosalie Rose Distinguished Professor of Natural Sciences and Mathematics at Bard College. A former member of the Institute for Advanced Study in Princeton, New Jersey, Dr. Gelbart was a Fulbright Lecturer in Norway in 1951. He taught at Syracuse University from 1943 to 1958, and was associated with the journal *Scripta Mathematica*, first as an associate editor and then, for 14 years, as editor. Dr. Gelbart is the co-developer of the theory of pseudoanalytic functions, the mathematical foundation for modern fluid dynamics. He has received several honorary degrees, has lectured at many American and European universities, and was lecturer at the Institute for Fluid Dynamics, Paris, France. In 1981, Dr. Gelbart was the recipient of the Bard Medal, the Bard Alumni/ae Association's highest honor. Bar-Ilan University in Israel recently named a chair in mathematics after Dr. Gelbart; and in 1986 he received an Award of Special Recognition from the School of Nursing at the University of Pennsylvania. He is currently writing a history of twentieth century science.



### *Associate Director*

Margaret Randolph Bledsoe, mathematician, is assistant professor of mathematics at Bard College. Formerly, she was an associate research scientist at the Courant Institute of Mathematical Sciences, she has also taught previously at the University of Louisville. Dr. Bledsoe has been a NASA trainee, an Amelia Earhart Fellow, a Danforth Fellow, and a Courant Institute Research Fellow. She received the Ph.D. from New York University with a dissertation on "The Method of Complex Characteristics for Design of Transonic Compressors," and she continues to work in the field.

### *Previous Participants in the Series*

The origin of the Distinguished Scientist Lecture Series goes back to the fall of 1979 when the late Nobel laureate physicist Paul Dirac accepted an invitation from the Bard College Center to deliver a lecture on "The Discovery of Anti-Matter."

His talk combined scientific analysis with the history of science and personal reminiscence to present a view of modern science rarely seen by the general public—science as a record of personal achievement as well as a body of facts and knowledge. Professor Dirac's lecture drew an audience from throughout the East Coast, and its success inspired the establishment of the Bard College Center Distinguished Scientist Lecture Series. The first two years of the Distinguished Scientist Lecture Series were supported by the Pre-College Teacher Development in Science Program of the National Science Foundation.

For all those interested in the field of science—students, teachers, researchers, professionals in scientific industries, and lay people—the series provides a rare opportunity for first-hand contact with men and women who have shaped modern science—the chance to see how they think and work, how they view their own achievements, and how they assess the challenges that scientists face, now and in the future.

To date, including the 1986-87 lectures, audiences have heard 50 eminent scientists, including 32 Nobel laureates and two Fields medalists, speak on scientific issues of current and timeless concern. The brief account of speakers and topics that follows gives an indication of the range and depth of lecture presentations.





**Philip W. Anderson, Physicist**

December 4, 1982  
"Seeing the World Through Spin Glasses"

Dr. Anderson shared the 1977 Nobel Prize in Physics with Sir Nevill Mott and John H. Van Vleck, for their theoretical investigations of the electronic structure of magnetic and disordered systems. He is the Joseph Henry Professor at Princeton, and the director of physics principles research at Bell Laboratories.



**Christian Anfinsen, Biological Chemist**

March 13, 1984  
"The Formation of Three-Dimensional Structures of Proteins"

Dr. Anfinsen is professor of biology at Johns Hopkins University. In 1972, he shared the Nobel Prize in Chemistry with Stanford Moore and William H. Stein for their study of the enzyme ribonuclease. He has received the Rockefeller Foundation Public Service Award and a Guggenheim Fellowship, and is a member of the National Academy of Sciences and the Royal Danish Academy, among others.



**Julius Axelrod, Biochemical Pharmacologist**

February 16, 1985  
"Neurotransmitters and Drugs that Affect the Mind"

Dr. Axelrod received the 1979 Nobel Prize in Medicine or Physiology jointly with Ulf von Euler for their contributions in the area of the sympathetic nervous system. Consequences of Dr. Axelrod's research have included an understanding of the actions of many drugs important in cardiology, psychiatry, and neurology. He is chief of the section on pharmacology, Laboratory of Chemical Science, at the Institute of Mental Health in Bethesda, Maryland.



**Paul Berg, Biochemist**

May 22, 1982  
"Gene Isolation and Manipulation: A New Window on Our Heredity"

Dr. Berg won the 1980 Nobel Prize in Chemistry for his studies of the biochemistry of nucleic acids, particularly recombinant DNA. The Willson Professor of Biochemistry at Stanford University Medical Center, he has been active in experiments designed to explore the chemistry and biology of mammalian and human chromosomes.

**Konrad E. Bloch, Biochemist**

November 6, 1982  
"On the Evolution of Small Molecules"

Dr. Bloch shared the 1964 Nobel Prize in Medicine or Physiology with Fedor Lynen, for their contributions to our knowledge of the complex pattern of reactions involved in the biosynthesis of cholesterol and of fatty acids. He is the Higgins Professor of Biochemistry at Harvard University. Among his many awards is the Fritzsche Award of the American Chemical Society.



**Nicolaas Bloembergen, Physicist**

December 1, 1984  
"Lasers in Science and Technology"

Dr. Bloembergen was awarded the 1981 Nobel Prize in Physics jointly with A.L. Schawlow for their work in the development of laser spectroscopy. The Gerhard Gade University Professor at Harvard University, he is the author of *Nuclear Magnetic Relaxation and Nonlinear Optics*. Honors for his work include the National Medal of Science and the Lorentz Medal of the Royal Dutch Academy of Science.



**Baruch S. Blumberg, Research Physician**

October 13, 1984  
"Biology of Hepatitis B Virus"

Dr. Blumberg was awarded the Nobel Prize in Medicine and Physiology in 1976 for his discovery concerning new mechanisms for the origin and dissemination of infectious diseases. He has been University Professor of Medicine and Anthropology at the University of Pennsylvania since 1977 and is Eastman Visiting Professor at Balliol College, Oxford University, and associate director for clinical research and senior member of the Institute for Cancer Research in Philadelphia.



**David Botstein, Biologist**

May 5, 1984  
"Mapping the Human Genome DNA Polymorphisms"

Dr. Botstein is professor of biology at Massachusetts Institute of Technology. A member of the National Academy of Sciences since 1981, he has received the NIH Career Achievement Award, and the Eli Lilly and Company Award in Microbiology and Immunology. Dr. Botstein is the author of *Advanced Bacterial Genetics*, as well as many articles on genetics and molecular genetics.





### *Paul Dirac, Theoretical Physicist*

May 15, 1982  
"From Einstein to Anti-Matter"

One of the great mathematical physicists of the twentieth century, Professor Dirac was one of a select few, including Albert Einstein, Erwin Schrödinger, and Enrico Fermi, whose theories have transformed our understanding of the physical universe. His pioneer work in the quantum mechanics of the atom won him the Nobel Prize in Physics along with Schrödinger in 1933 at the age of 31.



### *Carl Djerassi, Chemist*

May 23, 1981  
"The Politics of Contraception"

Dr. Djerassi is professor of chemistry at Stanford University, a Bard College Center Fellow, and president of Zoecon Corporation. Among his awards are the American Chemical Society Award in Pure Chemistry and the Baekeland Medal. An authority on fertility control in humans as well as insects, he played a major role in the development of the first oral contraceptive.



### *Gerald Maurice Edelman*

March 8, 1985  
"The New Embryology: Molecules Regulating Animal Forms"

Dr. Edelman is Vincent Astor Distinguished Professor at the Hospital of Rockefeller University. He received the Nobel Prize for Medicine or Physiology in 1972 for his research into the chemical structure of antibodies. Among the many other awards received include the Regents Medal of Excellence from New York State, the Buchman Memorial Award from the California Institute of Technology, the Eli Lilly Award, and the Albert Einstein Memorial Award. Dr. Edelman is currently chairman of the advisory board of the Basel Institute of Immunology, and serves on boards for the Weizmann Institute of Science and the Salk Institute of Biological Studies, among others.

### *Claire M. Fagin, Nursing Researcher*

April 27, 1985  
"Consumerism and Health: Whose Body Is It, Anyway?"

Dr. Fagin is dean of the School of Nursing at the University of Pennsylvania. Her major area of research is the affects of maternal attendance during children's hospitalization; she has also investigated the cost effectiveness of nursing intervention and nurse-consumer collaboration. Her books include *Nursing in Child Psychiatry* and *Family Centered Nursing in Community Psychiatry*, both chosen as Books of the Year by the *American Journal of Nursing*.



### *Charles Fefferman, Mathematician*

April 14, 1984  
"Twentieth Century Geometry"  
October 12, 1985  
"The Mathematics Behind the Computer"

Professor of mathematics at Princeton University, Dr. Fefferman has focused on Fourier analysis, partial differential equations, and several complex variables in his mathematics research. He was the first recipient of the National Science Foundation's Alan T. Waterman Award and has received the Fields Medal from the International Congress of Mathematicians, among other awards. Honors for his work have come extraordinarily early, beginning with his appointment at the age of 22 as full professor at the University of Chicago.



### *Paul J. Flory, Chemist*

February 13, 1982  
"Spatial Configurations of Macromolecules"

A leader in the field of polymer behavior, Dr. Flory was the sole recipient of the 1974 Nobel Prize in Chemistry. The J.G. Jackson-C.J. Wood Professor of Chemistry at Stanford University, Dr. Flory has also received the American Physical Society's High Polymer Physics Prize and the National Medal of Science. His research has been in the chemistry and physics of giant molecules, or polymers, which make up such materials as natural and synthetic rubber, fibers, and plastics.





**Sheldon Lee Glashow, Physicist**

December 7, 1985  
"The Challenge of Particle Physics"

Dr. Glashow is Higgins Professor of Physics at Harvard University. In 1979, he was awarded the Nobel Prize in Physics for his research on the Weinberg-Salem theory of weak interaction. In addition to the Nobel Prize, Dr. Glashow received the Jr. R. Oppenheimer Prize, the George Ledlie Prize, and the Castiglione di Sicilia Prize. He is the president of the International Sakharov Committee and a member of the National Academy of Sciences and the American Academy of Arts and Sciences.



**Dudley R. Herschbach, Chemist**

April 9, 1983  
"Single Collision Chemistry"

Dr. Herschbach is the Frank B. Baird Jr. Professor of Science at Harvard University. The major theme of his research has been the molecular dynamics of chemical reactions. He has received the Pure Chemistry Prize of the American Chemical Society, the Linus Pauling Medal, and the Michael Polanyi Medal, among others.



**Gerhard Herzberg, Physicist, Chemist**

November 5, 1983  
"Spectroscopic Studies of Simple Free Radicals"

Dr. Herzberg is Distinguished Research Scientist of the National Research Council of Canada. In 1971, Dr. Herzberg received the Nobel Prize for his study of molecular structure. He is an honorary member or fellow of many scientific societies, including the Royal Societies of Canada and London, and holds honorary degrees from universities in Canada and abroad. Dr. Herzberg is author of many books on molecular and atomic spectroscopy.



**Roald Hoffmann, Chemist**

April 16, 1983  
"What Chemists Really Do—The Logical Structure of Modern Chemistry"

Dr. Hoffmann shared the 1981 Nobel Prize in Chemistry with Kenichi Fukui. The John A. Newman Professor of Physical Science at Cornell University, he is the only person ever to have received the American Chemical Society's Award in Pure Chemistry in two different subfields—the A.C. Cope Award in Organic Chemistry in 1973 and the Award in Inorganic Chemistry in 1982.

**Mark Kac, Mathematician**

October 18, 1980  
"Chance and Regularity"

Dr. Kac is professor of mathematics and theoretical physics at the Rockefeller University. He has twice won the Chauvenet Prize of the Mathematical Association of America, and is the recipient of the 1976 Alfred Jurzykowski Foundation Award in Science and of the 1978 Birkhoff Prize. Dr. Kac is an authority on probability theory, particularly its use in mathematical analysis and statistical physics.



**Arthur Kornberg, Biologist**

February 21, 1981  
"DNA Replication"

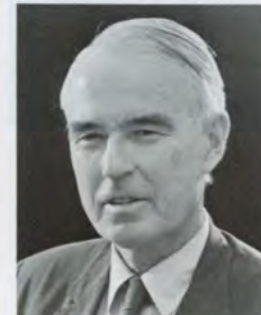
Dr. Kornberg won the 1959 Nobel Prize in Medicine or Physiology, with Dr. Severo Ochoa, a professor at the Stanford University of Medicine. His most notable achievements have grown out of his research into the structure and dynamics of DNA. In 1967, working with a team of biochemists at Stanford, he became the first to synthesize biologically active DNA outside a living cell.



**Willis E. Lamb, Physicist**

April 25, 1981  
"Simple Problems in Physics"

Dr. Lamb was awarded the 1955 Nobel Prize in Physics with Dr. Polykarp Kusch for his discoveries regarding the structure of the hydrogen spectrum. A professor of physics and optical sciences at the University of Arizona, he was a Fulbright Lecturer at the University of Grenoble. He has won the Rumford Premium of the American Academy of Arts and Sciences and the Guthrie Award from the Physical Society of London.



**Joshua Lederberg, Geneticist**

October 10, 1981  
"Styles and Patterns in Biomedical Research"

At the age of 33, Dr. Lederberg was named a co-recipient of the Nobel Prize in Medicine or Physiology along with Dr. E.L. Tatum and Dr. George Beadle. The president of the Rockefeller University, Dr. Lederberg pioneered in the field of bacterial genetics with his revolutionary discovery that bacterial strains could be crossed to produce an offspring containing a new combination of genetic factors.





### *Tsung-Dao Lee, Physicist*

May 1, 1982

"Is Vacuum a Physical Medium"

At the age of 30, Dr. Lee was named co-recipient of the 1957 Nobel Prize in Physics with Dr. C.N. Yang, for discoveries that challenged the principle of "Conservation of Parity," on which much of modern physics had been based. They theorized that in key cases parity need not be observed; subsequent experiments proved them right. The Enrico Fermi Professor of Physics at Columbia University, Dr. Lee has received the Albert Einstein Award in Science.

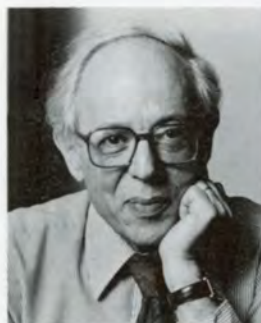


### *William N. Lipscomb, Jr., Chemist*

March 19, 1983

"How Do Enzymes Work?"

Dr. Lipscomb won the 1976 Nobel Prize in Chemistry for his original research on the structure and bonding of boron hydrides and their derivatives. The Abbott and James Lawrence Professor at Harvard University, he has long been the dominant figure in the field of boron chemistry. His numerous other honors include the Alexander von Humboldt-Stiftung Senior Scientist Award and the Peter Debye Award in Physical Chemistry.



### *Abraham Pais, Physicist*

April 3, 1982

"Einstein, the Science and the Life"

Detlev W. Bronk Professor of the Rockefeller University, Dr. Pais has received the J. Robert Oppenheimer Memorial Prize. A founding father of particle physics, he and his colleagues have investigated fundamental particle processes at high energies, symmetries of strong and weak interactions, and quantum field theory. He has played a leading role in developing an explanation for the behavior of the interactions in particle physics.

### *Arno A. Penzias, Astrophysicist*

February 28, 1984

"Our Changing View of the Universe"

Dr. Penzias is vice-president of Bell Laboratories Research. He is best known for his part in his discovery of evidence supporting the "big-bang" theory of the origin of the universe, for which he shared the 1978 Nobel Prize for Physics. He is a member of the National Academy of Sciences, as well as many other scientific organizations. He is the only American to hold an honorary doctorate from the Paris Observatory.



### *George C. Pimentel, Chemist*

April 24, 1982

"From Chemical Lasers to the Atmosphere of Mars"

Dr. Pimentel is director of the Laboratory of Chemical Biodynamics and professor of chemistry at the University of California at Berkeley. He has received many awards including the Distinguished Service Gold Medal from the National Science Foundation. His pioneering development of rapid scan techniques for infrared spectroscopy led to the design of a unique infrared spectrometer for the 1969 Mariner interplanetary spacecraft to determine the composition of the atmosphere of Mars.



### *Ilya Prigogine, Chemist*

November 13, 1982

"Probing Into Time"

In 1977, Dr. Prigogine won the Nobel Prize in Chemistry for his contributions to nonequilibrium thermodynamics, particularly the theory of dissipative structures. Professor at the Free University in Brussels and director of the International Institutes of Physics and Chemistry, he has received numerous honors including the Rumford Gold Medal of the Royal Society of London and the Descartes Medal of the University of Paris.





*I.I. Rabi, Physicist*

March 14, 1981

"Molecular Beams, Experimental Discovery, and Theoretical and Mathematical Insights"

Dr. Rabi received the 1944 Nobel Prize in Physics for developing the molecular beam resonance technique, a major tool in nuclear research. Professor of physics at Columbia University, he has served on the U.S. Atomic Energy Commission, conducted research at Brookhaven National Laboratories on peacetime uses of atomic energy, and advised the government on science under a succession of presidents.

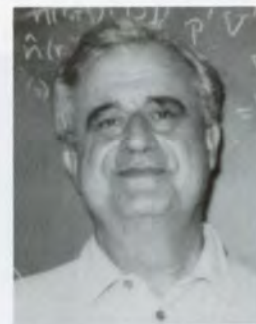


*Frederick C. Robbins, Physician*

December 3, 1983

"The Impact of Science on Medicine and Health"

President of the Institute of Medicine of the National Academy of Sciences and dean emeritus of the Case Western Reserve University School of Medicine, Dr. Robbins received the Nobel Prize in Medicine or Physiology in 1954, jointly with Dr. John F. Enders and Dr. Thomas H. Weller, for their work in the cultivation of the poliomyelitis virus in tissue culture and the application of this technique. He has also been honored with the Modern Medicine Award for Distinguished Achievement and the Medical Mutual Honor Award.



*Marshall Nicholas Rosenbluth, Theoretical Physicist*

April 26, 1986

"Fusion: Our Energy Future"

Dr. Rosenbluth is director of the Institute for Fusion Studies at the University of Texas at Austin. He has been instrumental in laying the foundations of plasma physics and its relationship to magnetohydrodynamics, and his work has led to a variety of applications in the field of controlled fusion research. Dr. Rosenbluth has been awarded the E.O Lawrence Prize, the Albert Einstein Award, and the James Clerk Maxwell Prize in Plasma Physics.

*Harold A. Scheraga, Chemist*

November 3, 1984

"Molecular Recognition in Proteins"

Dr. Scheraga is Todd Professor of Chemistry at Cornell University. His research has focused on the physical chemistry of proteins and other macromolecules, on the chemistry of blood clotting, and on the structure of water and dilute aqueous solutions. His many distinctions include a Guggenheim Fellowship, a Fulbright Research Scholarship, the American Chemical Society's Eli Lilly Award, and membership in the National Academy of Sciences and the American Academy of Arts and Sciences.



*Edward Teller, Physicist*

December 13, 1980

"The Persian Gulf—If It's Still There"

Dr. Teller is director emeritus of the Lawrence Livermore Radiation Laboratory and a senior research fellow at the Hoover Institution on War, Revolution and Peace. He has received the Joseph Priestley Memorial Award, the Albert Einstein Award, and the Fermi Award. Dr. Teller is interested in the application of nuclear energy, particularly as part of a comprehensive energy plan for the United States.



*Samuel C.C. Ting, Physicist*

October 16, 1982

"Search for the Fundamental Structures of the Universe"

In 1976, Dr. Ting was named co-recipient of the Nobel Prize in Physics with Dr. Burton Richter. Dr. Ting and Dr. Richter, working in separate groups, electrified the world of high energy physics in November 1974 with the discovery of a new particle with remarkable properties. The implications of their experiments continue to stimulate reformulation of our basic understanding of matter.





### *Charles Hard Townes, Physicist*

November 2, 1985

"Evidence for a Black Hole at the Center of Our Galaxy"

Dr. Townes is University Professor of Physics at the University of California at Berkeley. In 1964, he received the Nobel Prize in Physics for his fundamental work in the field of quantum electronics. The recipient of the Comstock Award from the National Academy of Sciences and the Rumford Premium from the American Academy of Arts and Sciences, among other prestigious awards, Dr. Townes is a foreign member of the Royal Society of London and a member of the National Academy of Sciences and the American Astronomy Society.



### *George Wald, Biologist*

March 28, 1981

"Life in the Universe"

Dr. Wald won the 1967 Nobel Prize in Physiology with Haldan K. Hartline and Ragner Granit. A professor emeritus at Harvard University, he has also received awards from the American Public Health Association and the American Academy of Arts and Sciences. Dr. Wald is an expert on the chemistry and physiology of the human eye, especially the chemical process by which light is transmuted into sight.



### *John Stewart Waugh, Chemist*

April 19, 1986

"Prospects for NMR Spectroscopy at Very Low Temperatures"

Dr. Waugh is Albert Amos Noyes Professor of the Massachusetts Institute of Technology. Known for his fundamental contributions to the field of high-resolution nuclear magnetic resonance spectroscopy in solids, he has received the Irving Langmuir Award and fellowships from the Sloan and Guggenheim foundations, and has been a fellow of the American Academy of Arts and Sciences and the American Physical Society. He is the author of *New NMR Methods in Solid State Physics* and an editor of numerous technical journals.

### *Frank H. Westheimer, Chemist*

March 20, 1982

"Photoaffinity Labeling: Marking the Receptors for Biological Molecules"

Dr. Westheimer is Morris Loeb Professor of Chemistry at Harvard University. Among the distinctions received for his work is the National Academy of Sciences Award in Chemical Science. Dr. Westheimer's research has included mechanisms of the hydrolysis and phosphate esters, photoaffinity labeling, and biochemical oxidation-reduction reactions.



### *Benjamin Widom, Physical Chemist*

March 23, 1985

"The Critical Points of Phase Transformations"

Professor of chemistry at Cornell University, Dr. Widom has focused his research on phase transitions and statistical mechanics. Awards for his work include Guggenheim and Fulbright fellowships and the appointment as National Science Foundation Senior Fellow in 1965. He is a member of the National Academy of Sciences, the American Physical Society, and the American Academy of Arts and Sciences.



### *Eugene Wigner, Physicist*

November 1, 1980

"Problem of Quantum Mechanics Measurement Process"

Dr. Wigner won the 1963 Nobel Prize in Physics. He is best known for his pioneering work in nuclear structure, especially the application of the mathematical system of group theory to atomic and nuclear problems. While at the University of Chicago he participated with Enrico Fermi in the experiment that produced the first controlled nuclear reaction. He has received the Fermi Award, the Albert Einstein Award, and the National Medal of Science.





**E. Bright Wilson, Chemist**

May 9, 1981  
"Recent Development in Molecular Spectroscopy and Some of Their Implications"

Dr. Wilson is professor emeritus at Harvard. Since 1977, he has been the chairman of the Committee of Radioactive Waste Management of the National Academy of Science. For the past several decades he has worked on the microwave spectroscopy of large molecules, and is continuing his studies of the internal and overall rotational motion of chemical species in gases. Among his many awards is the National Medal of Science.



**Rosalyn Yalow, Medical Researcher**

April 11, 1981  
"Radioactivity in the Service of Man"

Recipient of the 1977 Nobel Prize in Medicine, Dr. Yalow is senior medical investigator for the Veterans Administration Medical Center and chairman of the Department of Clinical Sciences at Montefiore Medical Center. She has received awards from the American Diabetes Association and the World Federation of Nuclear Medicine and Biology. Dr. Yalow has been a pioneer in the use of radioimmunoassay (RIA) in medical research and diagnosis.



**Chen Ning Yang, Physicist**

October 15, 1983  
"Albert Einstein and Contemporary Physics"

Dr. Yang is Albert Einstein Professor and director of the Institute of Theoretical Physics at the State University of New York at Stony Brook. In 1957, he was named co-recipient of the Nobel Prize in Physics with Dr. Tsung-Dao Lee. In addition to the Nobel Prize, his honors include the 1980 Rumford Prize and the 1957 Albert Einstein Commemorative Award.

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