

1-1-1989

## Distinguished Scientist Lecture Series Program 1989-1990

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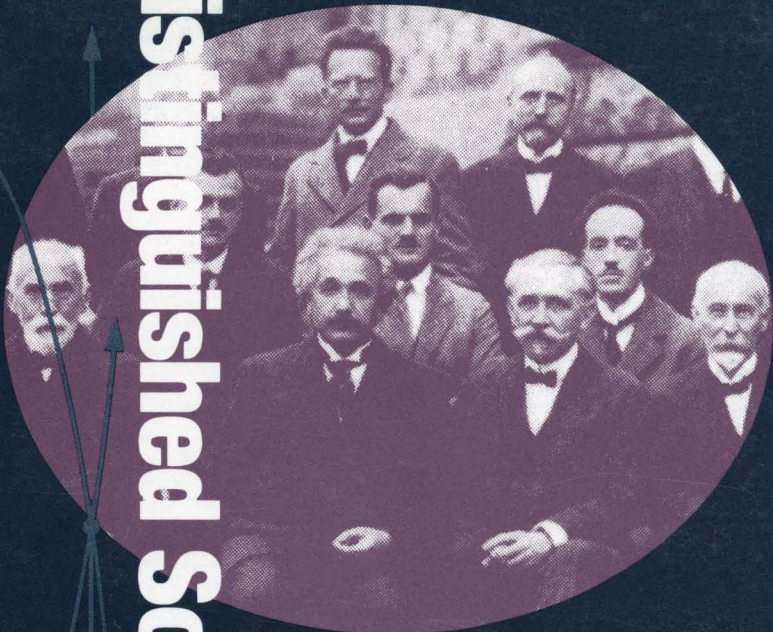
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# Distinguished Scientist



## Lecture Series

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1989-1990

# Distinguished Scientist

## Schedule of Lectures

September 23, 1989

Mildred S. Dresselhaus

*Frontiers of Materials Research*

October 14, 1989

David Bryant Mumford

*What is 'Seeing' and How Come Computers Can't  
Do It While We Can*

November 18, 1989

Norman F. Ramsey

*Time and the Physical Universe*

March 17, 1990

Saul Wolfe

*Drug-Receptor Interactions: A Chemist's  
Approach*

April 7, 1990

Robert Gallo

*Retroviruses in Cancer and AIDS*

April 28, 1990

Stephen Smale

*The Nature of the Computer: A Non-traditional  
Point of View*



**Mildred S. Dresselhaus,  
Physicist  
and Electrical Engineer**  
September 23, 1989

*Frontiers of Materials  
Research*

Dr. Dresselhaus is currently Institute Professor at the Massachusetts Institute of Technology. She was formerly the holder of the Abby Rockefeller Mauze Chair in Electrical Engineering and in Physics at MIT. She is also affiliated with the Center for Materials and Engineering, and with the Francis Bitter National Magnet Laboratory at MIT where some of the experimental work of her group is carried out. Dr. Dresselhaus holds professorships in MIT's Department of Electrical Engineering and Computer Science and the Department of Physics.

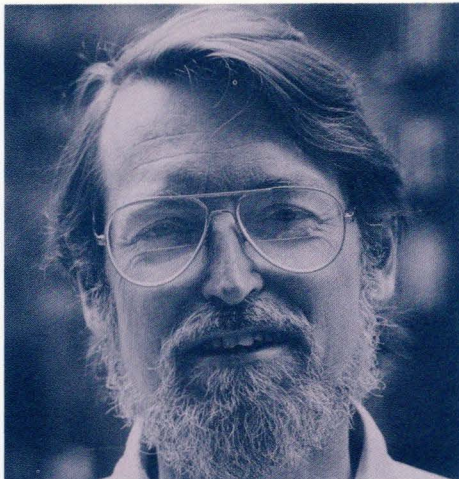
Dr. Dresselhaus was born in Brooklyn and received her A.B. from Hunter College in 1951, graduating *Summa Cum Laude*. From 1951 to 1952, she was a Fulbright Fellow at Newnham College, Cambridge University, and was awarded an A.M. from Radcliffe College in 1953. She received her Ph.D. from the University of Chicago in 1958.

Dr. Dresselhaus was an NSF Postdoctoral Fellow at Cornell University from 1958–60, and Staff Member at the MIT Lincoln Laboratory from 1967–70. She has traveled widely as a visiting professor, holding that position in the Department of Physics of the University of Campinas (Brazil), in the summer of 1971, as well as the physics departments of the Israel Institute of Technology in Haifa, Israel (1972), the Aoyama Gakuin University and Nihon University in Tokyo, Japan (1973), and the Instituto Venezolano de Investigaciones Cientificas in Caracas, Venezuela (1977).

Dr. Dresselhaus has received many honorary degrees and awards, among them the Hunter College Hall of Fame Award in 1972, the MIT Killian Faculty Award in 1986, and the Annual Achievement Award from the Engineering Societies of New England in 1988. She was elected to the American Academy of Arts and Sciences (1974), the National Academy of Engineering (1974), and the National Academy of Science (1985).

Dr. Dresselhaus was a member of the Committee on the Education and Employment of Women in Science and Engineering of the Commission on Human Resources, National Research Council, from 1975–77, and in 1984 served as President of the American Physical Society. She is a senior member of the Society of Women Engineers, and was an elected member of the Harvard Alumni Board of Directors from 1974–77. She was on the editorial board of the *Physical Review B* from 1979–81, and in 1988 became a trustee of the Rensselaer Polytechnic Institute.

**Her Work** • Dr. Dresselhaus has used and developed a wide range of techniques to study condensed matter physics, from microwave properties of superconductors to magnetic phases in semiconductors, and electronic structure of group V semimetals and graphite.



**David Bryant Mumford,  
Mathematician**

October 14, 1989

*What is 'Seeing' and  
How Come Computers  
Can't Do It While  
We Can*

David Mumford is the Higgins Professor of Mathematics at Harvard University. He was born in Sussex, England and received his B.A. from Harvard in 1957, graduating *Magna Cum Laude*. He completed his Ph.D. at Harvard in 1961.

After receiving his Ph.D., Dr. Mumford became an instructor and research fellow in mathematics at Harvard, and in 1962 he was made an assistant professor. During this time he was also a member of the Institute for Advanced Study at Princeton and a visiting professor at the University of Tokyo. In 1963 he became an associate professor at Harvard, and was made Full Professor in 1967. He became the Higgins Professor of Mathematics in 1977, and from 1981–84 served as chairman of the Department of Mathematics. Dr. Mumford has twice been a visiting professor at the Tata Institute of Fundamental Research, Bombay, India, and in 1976–77 was a visiting professor at the Institute des Hautes Etudes Scientifiques in Paris.

Dr. Mumford was a junior fellow in the Society of Fellows at Harvard while completing his post-graduate work there. In 1974, he was awarded the Fields Medal by the International Congress of Mathematics, and in 1975 he was elected to the National Academy of Sciences. He was made an honorary fellow of the Tata Institute for Fundamental Research in 1978, and was awarded an honorary degree of Doctor of Science by the University of Warwick in 1983. Dr. Mumford is currently a MacArthur Foundation Fellow. His published work includes *Lectures on Curves and Surfaces* (with G. Bergman, 1964), *Abelian Varieties* (1974), and *Curves and Their Jacobians* (1975). He is currently at work on a book entitled *An Atlas of Kleinian Groups*, which will be published by the Cambridge University Press.

**His Work** • Dr. Mumford has been honored for his many important contributions to the field of algebraic geometry. In the past few years he has begun to study the complex mechanisms underlying avian and human visual perception.



**Norman F. Ramsey,  
Physicist**

November 18, 1989

*Time and the Physical  
Universe*

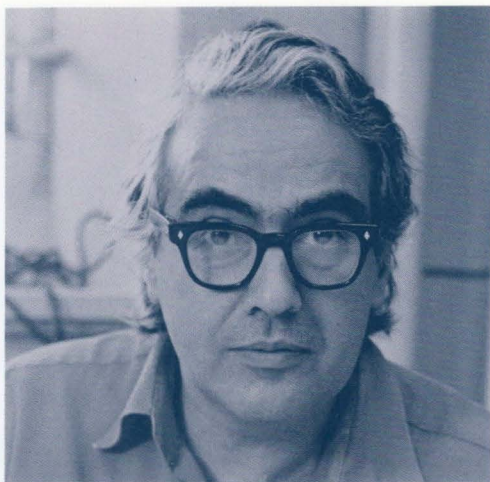
Norman F. Ramsey is the Higgins Professor of Physics at Harvard University. He has been a Harvard faculty member since 1947.

Norman Ramsey received his A.B. and M.A. from Columbia University and degrees from Cambridge University. In 1940 he received a Ph.D. from Columbia University for molecular beam studies of rotational magnetic moments of molecules. He was awarded an Sc.D. by Cambridge University in 1954 and by Oxford University in 1973, as well as honorary D.Sc.'s from Case-Western Reserve University, Middlebury College, and Rockefeller University. After periods at the Carnegie Institution of Washington, the University of Illinois, the MIT Radiation Laboratory, and Los Alamos, he became an Associate Professor at Columbia University. He was executive secretary of the group of scientists who established Brookhaven National Laboratory and was the first chairman of its physics department.

Norman Ramsey has been a Guggenheim Fellow and was the George Eastman Professor at Oxford University in 1973–74. He was chairman of the physics section of the American Association for the Advancement of Science in 1977–78 and president of the American Physical Society in 1978–79. From 1966 to 1981 he was president of the Universities Research Association, which operates the Fermi National Accelerator Laboratory. He has been a trustee of the Carnegie Endowment for International Peace since 1962 and of Rockefeller University since 1977. Since 1980 he has been chairman of the Board of Governors of the American Institute of Physics and since 1985 he has been president of the United Chapters of Phi Beta Kappa.

Dr. Ramsey is a member of the American Physical Society, the Institute of Electrical and Electronics Engineers, the American Philosophical Society, the American Academy of Arts and Sciences, and the National Academy of Sciences. He received the Presidential Certificate of Merit in 1950, the E.O. Lawrence Award in 1960, the Davisson-Germer Prize in 1974, the IEEE Medal of Honor in 1984, the 1980 Columbia Award for Excellence in Science, and the 1987 IEEE Centennial Medal. Dr. Ramsey has also received the Monie Ferst Award, the Rabi Prize, the Mumford Premium in 1985, the Compton Medal in 1986, the Oersted Medal, and the National Medal of Science in 1988. Dr. Ramsey's books include *Experimental Nuclear Physics*, *Nuclear Moments*, *Molecular Beams*, and *Quick Calculus!*

**His Work** • Dr. Ramsey has developed theories and experimental methods in fields ranging from particle physics to molecular beams. He and his associates have made precision measurements of the electric and magnetic properties of nucleons, nuclei, atoms, and molecules. He is well known for his work on atomic and molecular beams, including the invention of the hydrogen maser.



**Saul Wolfe,  
Organic Chemist**

March 17, 1990

*Drug-Receptor  
Interactions:  
A Chemist's Approach*

Dr. Wolfe, the Chown Research Professor of Chemistry at Queen's University, Kingston, Ontario, is the author of over 200 scientific papers and holds over 30 patents, including one for the commercial production of the drug ampicillin. He is co-author of the monograph *Theoretical Physical Organic Chemistry* to be published by John Wiley & Sons in 1990.

Professor Wolfe earned his B.A. and M.A. degrees from the University of Toronto and his Ph.D. from the University of Ottawa. He completed post-doctoral studies at the Weizmann Institute in Israel before joining the pharmaceutical division of Bristol-Myers. In his 28 years at Queen's University he has conducted research in drug design and has pioneered strategies which use biotechnology to reduce the time involved in the synthesis of new drugs. He has also addressed the theoretical aspects of the structure and reactivity of large molecules, specifically with regards to interactions between drugs and their receptors.

Professor Wolfe's research efforts have been recognized by his election as a fellow of both the Chemical Institute of Canada and the Royal Society of Canada, by the Merck Award for outstanding achievement in organic chemistry, and by the Queen's University Prize for Excellence in Research.

Professor Wolfe has lectured world-wide on topics ranging from pharmaceuticals to theoretical chemistry. Many of his former students hold professorships at major universities in the U.S., Canada, and Europe, and his research collaborators span the globe.

**His Work** • Professor Wolfe's recent publications describe strategies for peptide conformational analysis as applied to receptor sites in drug design. Applications of these procedures have resulted in structure-activity relationships for penicillin and anti-convulsant drugs, among others.



**Robert Gallo,  
Medical Researcher**

April 7, 1990

*Retroviruses  
in Cancer and AIDS*

Robert Gallo is one of the foremost virologists in the United States and is a leader in Cancer and AIDS research.

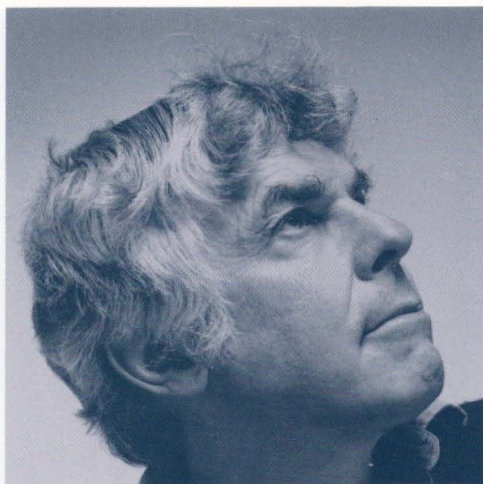
Robert Gallo was born in Waterbury, Connecticut, received his B.S. from Providence College in 1959, and was awarded an M.D. by Jefferson Medical College in 1963. After serving as an intern and resident in medicine at the University of Chicago, Dr. Gallo moved to the National Cancer Institute, where he has been a clinical associate at the Medical Branch, a senior investigator and head of the section on cellular control mechanisms of the Human Tumor Cell Biology Branch, and is now Chief of the Laboratory of Tumor Cell Biology.

Dr. Gallo has served as adjunct professor of genetics at George Washington University, and adjunct professor of microbiology at Cornell University. In 1981 he represented the United States at the conference of the International Comparative Leukemia and Lymphoma Association. Dr. Gallo has served on the board of governors of the Franco-American AIDS Foundation and the World AIDS Foundation.

Dr. Gallo received an honorary D.Sc. from his *alma mater*, Providence College, in 1974, the same year he was the recipient of the Dameshek Award of the American Hematology Society. He received the F. Stohlman Lecture Award in 1979. In 1983, he was given the Griffuel Prize by the Association for Cancer Research in France, and was recognized by the American Society of Infectious Disease in 1986. Dr. Gallo was also given the 1988 Japan Prize in Preventative Medicine.

**His Work** • Early work on the nucleic acid metabolism of normal and leukemic white blood cells led Dr. Gallo to studies of a reverse transcriptase in human leukemic cells and thence to the reverse transcriptases of the various retroviruses, many of which were known to cause cancer in animals. In 1980 he isolated the first human retrovirus, T-cell leukemia virus type I (HTLV-I), and in 1983 he predicted that the newly-defined disease called acquired immunodeficiency syndrome (AIDS) would be found to be caused by a retrovirus. The hypothesis was confirmed with the discovery of the human immunodeficiency virus (HIV) that same year in France by Luc Montagnier and in his own lab in 1984.





**Stephen Smale,  
Mathematician**

April 28, 1990

*The Nature  
of the Computer:  
A Non-traditional  
Point of View*

Stephen Smale was born in Flint, Michigan and was educated at the University of Michigan, receiving his B.S. in 1952, his M.S. in 1953, and his Ph.D. in 1957. He is Professor of Mathematics at the University of California, Berkeley, a position he has held since 1964.

Dr. Smale is a foreign member of the Brazilian Academy of Science and the American Academy of Arts and Sciences. He has been a member of the Institute for Advanced Study at Princeton, and has twice been a visiting member at the Institute des Hautes Etudes Scientifiques. In 1976, he was visiting professor there, and has served in the same capacity at the Instituto de Matematica Pura e Aplicada in Rio de Janeiro, the University of Paris, and Yale University.

Dr. Smale has been given the Veblen Prize for Geometry of the American Mathematical Society (1965), the University of Michigan Sesquicentennial Award (1967), and the Chauvenet Prize of the Mathematical Association of America (1988). He is known for his proof of the integrity of the simplex algorithm, published in 1982.

**His Work** • Dr. Smale has directed his incisive attention to a succession of areas in mathematics over the years. He was honored with the Fields Medal for fundamental contributions to differential topology, including a pioneering proof of the Poincaré conjecture. He subsequently has made no less pioneering contributions to the fields of dynamical systems and, more recently, computational complexity, both areas of great current interest.