

American
Association
for the Advancement of
Science

1333 H Street, NW, Washington, DC 20005
(202) 326-6640; FAX (202) 371-9526



Richard S. Nicholson
Executive Officer

October 3, 1994

Dr. Monkombu S. Swaminathan
Centre for Research on Sustainable
Agricultural and Rural Development
III Cross Road
Taramani, Madras 600113, India

Dear Dr. Swaminathan:

On behalf of the AAAS Council, I am pleased to inform you of your election to the rank of AAAS Fellow.

Each year the Council elects members whose "efforts on behalf of the advancement of science or its applications are scientifically or socially distinguished." The honor of being elected a Fellow of AAAS began in 1874 and is acknowledged with a certificate and a rosette.

You are being honored for contributions in cytogenetics and breeding of potato and rice, for initiating high yielding Indian wheat varieties, and for research programs for sustainable agriculture in developing countries.

Your certificate and rosette will be presented to you in Atlanta on Saturday, February 18, 1995, during the AAAS Fellows Forum, a part of the Association's Annual Meeting. More information concerning the Forum will be sent to you soon. If you are unable to join us in Atlanta, your certificate and rosette will be mailed to you after the meeting.

Congratulations on this well-deserved recognition of your accomplishments.

Sincerely,

Richard S. Nicholson

RSN:lm

MSS/VS/ 1090
14 October, 1994

Dr. Richard S. Nicholson
Executive Officer
American Association for the Advancement
of Science, 1333 H Street NW
Washington DC 20005, USA

Dear Dr. Nicholson,

I am most grateful to you for your letter of 3 October informing me that I have been elected an AAAS Fellow. I am extremely grateful for this selection. It will be difficult for me to come to Atlanta on 18 February 1995 to receive the Certificate and Rosette personally. Kindly arrange to send it to me by mail after the meeting.

It is a privilege to be elected a Fellow of AAAS.

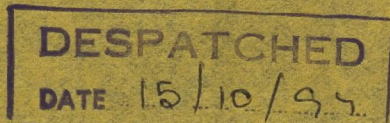
With warm personal regards,

Yours sincerely,



M.S. Swaminathan

Back to me Lpl. kafa
xerox copy of the
letter in the office file,



American
Association
for the Advancement of
Science

1333 H Street, NW, Washington, DC 20005
(202) 326-6640; FAX (202) 371-9526

Richard S. Nicholson
Executive Officer

March 2, 1995

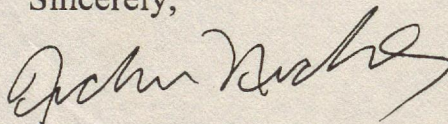
Dear Fellow:

This year's Fellow's Forum provided for an informative discussion on the role of the Congress as it relates to science and technology. More than 300 members participated in the Forum and over sixty of your peers elected to the status of Fellow in September 1994 shared in the program.

Since you were not able to join us in Atlanta for the festivities, please find your certificate and rosette enclosed. I hope you will be able to attend next year's event during our Annual Meeting in Baltimore.

In the meantime, best wishes for continued success.

Sincerely,



Richard S. Nicholson





AMERICAN ASSOCIATION FOR THE
ADVANCEMENT OF SCIENCE

Your AAAS Membership Card is enclosed. The card identifies you as an active member of the Association. The card contains important information about your AAAS membership, including your AAAS number, your membership category, and the primary section in which you are eligible to vote, hold elective office, and to be nominated as a Fellow. Please reference your AAAS number when calling for services.

NOV 26, 1997

M S SWAMINATHAN
11 RATHNA NAGAR TEYNAMPET
MADRAS 600018
INDIA

Presenting your
AAAS Membership Card

AS42



AMERICAN ASSOCIATION FOR THE
ADVANCEMENT OF SCIENCE

1200 NEW YORK AVENUE, NW, WASHINGTON, DC 20005

AAAS #

PRIMARY SECTION

00285102

AG/FD/REN RES-D

M S SWAMINATHAN

11/98 MEMBER -FELLOW

92

EXPIRATION
DATE

CATEGORY

MEMBER
SINCE

IMPORTANT — READ OTHER SIDE

AAAS MEMBER BENEFITS



- 51 issues of SCIENCE
- Science Online
- Annual Meetings — reduced fees & career services
- AAAS Credit Card option
- Car rental discounts
- Scientific expeditions
- Life insurance option
- Programs in science education, science policy, and international science

For details see Information Resources Listing
in Science, see the AAAS web site or
call Member Services.

Headquarters: 202-326-6400

Member Services: 202-326-6417

800-731-4939 (U.S.A. Only)

Email: membership@aaas.org

Web: www.aaas.org

Dear Member,

I want to take this opportunity to thank you for your recent dues payment and to present you with your new AAAS Membership Card.

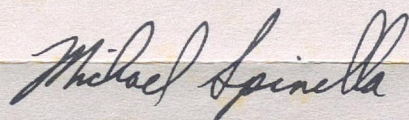
Your Membership Card serves a number of purposes. First and most important, it identifies you as a member of our broad and diverse scientific community and symbolizes your commitment to the goals and ideals of AAAS.

The card also serves a number of practical functions. It provides you with a convenient reference to your AAAS membership number. If you subscribe to Science Online, you will need to use your AAAS membership number to activate and manage your online subscription. Also, if you ever find you need to contact us about missed issues of Science or other AAAS benefits, having this number handy can help us to serve you better and efficiently.

There is also other information contained on the card, including your primary section affiliation, membership category and year joined. We need your help to ensure the accuracy and completeness of our database, so please take a moment to double check the information on your new card. If corrections are needed, or you have questions, please contact our Member Services Department in Washington, DC at 202-326-6417, fax number 202-842-1065. If you are calling within the United States, you may call our Member Services Department in Danbury, Connecticut at 1-800-731-4939.

Once again, thank you for your support and we look forward to serving you in the coming year.

Sincerely,



Michael P. Spinella
Director of Membership

American Association for the Advancement of Science



This is to certify that

Monkombu S. Swaminathan

was elected a

FELLOW

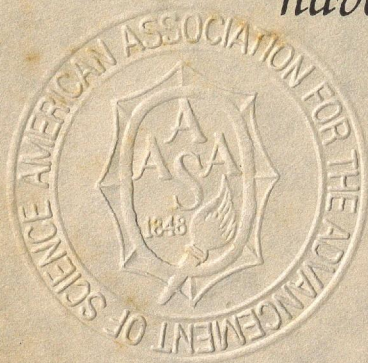
of the American Association for the Advancement of Science,

in testimony whereof

the President and the Executive Officer

have hereunto set their hands and the seal of the Association

this 23rd *day of* September *, 19*94



Manu M. Ayala
President

John V. Moore
Executive Officer

THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

AAAS

FELLOWS

ELECTED SEPTEMBER 1994

*AAAS honors with election as AAAS Fellow
those of its members whose efforts on behalf of the
advancement of science are scientifically or
socially distinguished.*

PRESENTED AT THE FELLOWS FORUM • 161ST AAAS NATIONAL MEETING

ATLANTA, GA • FEBRUARY 18, 1995

The American Association for the
Advancement of Science
is proud to present the 297
distinguished members
elected to the status of Fellow by the
AAAS Council in September 1994.

These members are to be praised
for their dedicated commitment
to furthering the scientific enterprise.

We applaud and commend the extraordinary
achievements of these individuals.

SECTION ON AGRICULTURE, FOOD, AND RENEWABLE RESOURCES

CHARLES J. ARNTZEN

For physiological and molecular genetic analysis of agriculturally important traits and for leadership in new agricultural research areas and university administration.

THOMAS E. FENTON

For research on soil forming processes, geomorphology, and soil characteristics related to soil erosion and productivity.

JOHN E. FOSS

For research, particularly in soil-landscape relationships, paleosoils and soil age, and soil weathering and erosion rates; for teaching; for services to professional societies; and for administrative support and leadership in agricultural and environmental sciences.

SHU GENG

For research and teaching in agrostistics and impact assessments of global climate change on agriculture, particularly for research in sustainable agriculture systems in Pacific Rim countries.

CLARE I. HARRIS

For many years of service and leadership in agricultural research at the Cooperative State Research Service of the U.S. Department of Agriculture.

GARY H. HEICHEL

For research on the limitations of symbiotic nitrogen fixation and carbon assimilation to forage productivity, the cycling of nitrogen in cropping systems, and for outstanding leadership as a department head.

ANDREW O. JACKSON

For pioneering studies on genome organization and molecular genetics of plant viruses and for development of procedures for isolating viruses and polyribosomes from plants.

JEROME J. JURINAK

For teaching and research in salt-affected soils, reclamation, water quality, environmental soil chemistry and assessment, and trace element chemistry.

DAVID E. KISSEL

For pioneering research on chemical/physical interactions of ammoniacal nitrogen with soil and nitrogen mineralization from soil and crop residues and for academic administration.

DAN E. PURCIFULL

For research on properties of plant viruses and inclusions and for diagnosis of viral diseases utilizing serological methods.

ROBERT C. RILEY

For administrative leadership in integrated pest management at the national level, particularly in initiating and facilitating productive collaboration between federal agencies and states.

MONKOMBU S. SWAMINATHAN

For contributions in cytogenetics and breeding of potato and rice; for initiating high yielding Indian wheat varieties; and for research programs for sustainable agriculture in developing countries.

KENNETH P. VOGEL

For significant achievements in genetic studies on perennial grasses and in developing improved grasses and associated management practices for use in the Great Plains and midwestern states.

SECTION ON ANTHROPOLOGY

GEOFFREY W. CONRAD

For extraordinary contributions to the synthesis, interpretation, and communication of the findings of American archaeology through important scholarly publications and museum work for the public.

RICHARD H. MEADOW

For pioneering methodological advances, for fostering international collaboration in zooarchaeology, and for elucidating the prehistory of animal domestication in the Middle East and South Asia.

MICHAEL F. MOSELEY

For pathbreaking fieldwork on the coast of Peru and for research and writings on the evolution of civilization in the Andes.

NANCY JEAN PAREZO

For research in the areas of material culture, economics and culture change, history of anthropology, and women in science; for training in ethics; and for service as a program officer at the National Science Foundation.

BARBARA L. STARK

For archaeological research on the pre-Columbian civilizations of Mesoamerica and for contributions to archaeological method and theory.

SECTION ON ASTRONOMY

ROBERT D. GEHRZ

For major contributions to infrared astronomy and to the understanding of infrared spectral features due to dust and gas in ionized interstellar media.

JOHN P. HUCHRA

For contributions to the study of motions of galaxies and the large-scale structure of the universe.

LEE ANNE M. WILLSON

For sustained contributions to the understanding of stars with extended atmospheres, mass loss, and variable stars.

SECTION ON ATMOSPHERIC AND HYDROSPHERIC SCIENCES

MARK A. CANE

For pioneering modelling and analysis techniques that enhance the understanding of and the ability to predict the El Niño-Southern Oscillation, thereby enabling actions to ameliorate its adverse effects.

MARGARET ANNE LEMONE

For research on meso-scale atmospheric structures and their relationship to the underlying land or ocean.

JOHN W. MILES

For fundamental contributions to understanding the development of waves by wind.

KEVIN E. TRENBERTH

For assembly and analysis of atmospheric data in ways that have significantly expanded the understanding of large-scale circulation and its variability.

GUNTER E. WELLER

For pioneering research in polar meteorology and climatology, in both northern and southern hemispheres, and for outstanding service in national and international scientific administration.

SECTION ON BIOLOGICAL SCIENCES

KATHRYN V. ANDERSON

For important studies in *Drosophila* development.

MARY COMBS BARBER

For contributions to science policy and to the advancement of women in science.

LAWRENCE W. BARNHOUSE

For application of population ecology to the development of ecological risk assessment.

MINA J. BISSELL

For pioneering work on the role of extracellular matrix in regulation of gene expression, tissue development, and cancer.

HANS R. BODE

For lasting contributions to the understanding of cell differentiation and pattern formation.

JOHN H. CAMPBELL

For distinguished contributions to the field of evolutionary biology, particularly to the participation of the organism and its genetic program to the evolution of the species.

BRUCE M. CARLSON

For research on regeneration, especially mammalian muscle, and for publication of an embryology textbook and popular articles on fish biology.

JAMES T. CARLTON

For pioneering research in marine biological invasions (introduced species) and modern-day extinctions of marine invertebrates in the ocean's coastal zones.

PIERRE CHAMBON

For pioneering studies on the control of gene expression.

ERNEST S. CHANG

For contributions to the field of crustacean physiology and growth.

ANDREW G. CLARK

For research in theoretical and empirical population genetics, including evolution of the Y chromosome, rDNA copy number, metabolic regulation, alternative splicing, and self-incompatibility.

LOUISE B. CLARKE

For pioneering studies on the structure and function of the centromere.

TOM CURRAN

For studies on the molecular biology of oncogenes.

THOMAS F. DEUEL

For studies of growth factors and oncogenesis.

WALTON L. FANGMAN

For studies of DNA replication and cell cycle regulation.

ELAINE M. FAUSTMAN

For pioneering contributions to risk assessment of reproductive and developmental toxicity.

ALAN FEDUCCIA

For outstanding scientific contributions to the evolution, morphology, embryology, and systematics of birds.

WALTER M. FITCH

For world leadership in the field of molecular evolution for nearly thirty years, especially for lasting contributions to the theory of tree-building, molecular clocks, and patterns of molecular evolution.

BRUCE W. FROST

For developing pelagic ecosystem models that clarify the effects of zooplankton grazers on the fate of carbon in the ocean and for application of these models as teaching tools.

CHANDLER M. FULTON

For diverse discoveries in biology, including rolling circle DNA replication, de novo formation of centrioles, and the multitubulin hypothesis, and for outstanding undergraduate teaching.

DAVID T. GIBSON

For long-term excellence in research on microbial biocatalysis and degradation of hydrocarbons and other xenobiotics and for educational and training accomplishments.

RICHARD GRANGER

For research in cognitive and computational neuroscience on the biological substrates of learning and memory.

JOSEPH L. GRAVES, JR.

For original contributions to the evolutionary theory of aging through an examination of its population genetics and physiological basis and for successful mentoring of minority graduate and undergraduate students in the biological sciences.

NEIL GREENBERG

For exemplary ethological research on the causes and consequences of social behavior and for innovative efforts to illuminate the relations between biology and the humanities.

PETER MICHAEL GRESSHOFF

For pioneering research on the developmental genetics of nodulation in legumes, genome analysis, and technology developments for molecular mapping and DNA fingerprinting in plants.

MARK T. GROUDINE

For studies on the regulation of gene expression, particularly oncogenes, and on the identification and characterization of elements that regulate gene expression over long distances.

JAMES E. HALL

For distinguished contributions to the field of biophysics, particularly to the understanding of mechanisms of gap junction and ion channel reconstitution.

BARBARA A. HAMKALO

For definitive contributions to the unraveling of chromosome structure and organization by imaginatively combining the tools of molecular biology and electron microscopy.

EARL RAYMOND HEITHAUS

For service as editor of *Biotropica*, for promoting teaching through undergraduate research, and for research in the ecology of pollination and seed dispersal.

SUSAN A. HENRY

For studies of the metabolic regulatory systems in yeast.

GEORGE V. HILLYER

For pioneering work on cross-immunity in schistosomiasis and fascioliasis and for careful analysis of the antigenic determinants both for immunity and immunodiagnosis.

KAREN A. HOLBROOK

For contributions as Chair of the AAAS Section on Biological Sciences and for research on human fetal skin development and genetic diseases of the skin.

LAURA L. MAYS HOOPEES

For national leadership in developing understanding and appreciation of undergraduate research as premier teaching, as well as valuable research, and for efforts to attract and retain minority students in science.

JOEL A. HUBERMAN

For pioneering studies of DNA replication, particularly for the discovery and characterization of eukaryotic DNA replication origins.

RICHARD R. HUDSON

For the insightful combination of biological understanding and mathematical modeling which have produced useful analyses of natural selection and random drift at the molecular level.

ANTHONY A. JAMES

For distinguished contributions to the field of molecular parasitology and molecular insect biology and for distinguished service in promoting science education, particularly among minority undergraduate and graduate students.

JAMES B. KAPER

For research in the ecology and molecular pathogenesis of *Vibrio cholerae* and diarrheagenic *Escherichia coli* and for development of a recombinant vaccine for the prevention of cholera.

JOAN PRISCILLA KILBOURN

For performing research on the microbiology of chronic obstructive lung diseases, evaluating and developing diagnostic kits, writing continuing education articles, and encouraging women in science.

LISA A. LEVIN

For establishing the significance of large protozoa xenophyophores in deep-sea ecosystems and for creative exploration of seamounts, larval dispersal, and recruitment issues in benthic ecology.

K. JUNE LINDSTEDT-SIVA

For pioneering the development of ecologically-based oil spill response planning; developing methods to minimize the ecological impacts of oil spills; advocating ecologically-based spill response in industry, government, scientific, and public forums; and pioneering environmental planning and management in the petroleum industry.

JUDY L. MEYER

For research in aquatic ecology that explored nutrient and organic matter dynamics and the importance of microbial food webs in rivers and streams.

CHARLES B. MILLER

For conception and direction in biological oceanography, particularly pelagic ecology and the biology of planktonic copepods.

DONALD J. NASH

For contributions to the genetic understanding of hearing impairment and for exemplary service and leadership to AAAS through the SWARM Division and its activities.

EUGENE W. NESTER

For pioneering research on the genetics of DNA transformation of *Bacillus subtilis*, for defining the mechanism of plant cell transformation by *Agrobacterium* and for studies on its use in plant genetic engineering, and for administrative contributions to the Department of Microbiology at the University of Washington.

KENNETH DALE NOEL

For research on the genetics, biochemistry, and symbiotic functions of polysaccharides in nitrogen fixing bacteria and on the role of purine metabolism in legume root nodule development.

MICHAEL L. PACE

For major advances in understanding controls on aquatic food webs and for integrating microorganisms into ecosystem models.

PHILIP D. REID

For establishing powerful new tools in the study of anatomy, histochemistry, and gene expression in plants and animals and for educational and administrative contributions to Smith College.

CHARLES E. RIBAK

For lasting contributions to the field of neurocytology, particularly toward the understanding of neuronal circuitry and neurotransmitters.

JAMES H. SCHWARTZ

For contributions to the field of neuroscience.

JAMES A. SHAPIRO

For innovative and creative interpretations of bacterial genetics and growth, especially the action of mobile genetic elements and the formation of bacterial colonies.

KENNETH SHERMAN

For advancing knowledge about marine fisheries and large marine ecosystems.

STANWYN G. SHETLER

For contributions to the formation of electronic data banks and computer registry of botanical specimens.

MICHAEL P. SHIARIS

For substantial contributions to microbial biodegradation, particularly degradation of polynuclear aromatic compounds.

CHARLES A. SIMENSTAD

For important advances in wetland and estuarine/coastal ecology research, especially in the Pacific Northwest and Alaska, and for conception and direction of the interdisciplinary and long-term Columbia River Land-Margin Ecosystem Research Project.

MARTYN T. SMITH

For research into the mechanisms by which chemicals produce toxicity in humans, especially the mechanisms of benzene-induced leukemia, and for outstanding contributions to environmental toxicology.

MICHAEL H. SMITH

For research in population biology and for administration of an interdisciplinary environmental research and education program.

LEONARD A. SMOCK

For research in the ecology of streams and wetlands, particularly blackwater streams and their floodplains.

ROBERT E. STEELE

For imaginative experiments and lasting contributions to understanding the role of proto-oncogenes in regulating cell growth, physiology, and morphology.

ROY A. STEIN

For research in aquatic community ecology, particularly for work that uses ecological theory to guide the pursuit and solution of long-standing problems in fishery management.

PAUL K. STUMPF

For research on plant lipid synthesis which formed the framework for present lipid biotechnology and for service as chief scientist of the U.S. Department of Agriculture, CSRS-NRI competitive grants program.

ANNE O. SUMMERS

For pioneering work on microbial transformations of toxic metals and for significant contributions to understanding the bioremediation of heavy metal contaminated environments.

ANDREA J. TENNER

For contributions toward understanding the regulation of the immune system, particularly the molecular basis of the enhancement of leukocyte function.

GARY A. TORANZOS

For significant contributions to environmental microbiology, specifically microbiology of drinking water, ground water, and water supplies.

DAVID C. VAN ESSEN

For contributions to the understanding of the primate visual system.

JUDY D. WALL

For important advances in the microbial genetics of sulfate-reducing bacteria and for administrative contributions to the educational process.

JOHN B. WATERBURY

For pioneering research on picoplankton and for establishing the importance of cyanobacteria in the marine environment.

ROBERT A. WHARTON, JR.

For pioneering studies in Antarctic ecology, particularly for research on the biogeochemistry of lakes in the Antarctic.

ROBERT F. WHITCOMB

For development of an internationally recognized database on spiroplasmas and other mollicutes of insects and plants.

DAVID C. WHITE

For establishing the powerful utility of biochemical signatures of microorganisms in the analysis of novel strains and microbial consortia in marine, terrestrial, and deep subsurface environments and for directional leadership in the field.

ROBERT G. WHITE

For pioneering studies on the use of tame animals to study basic nutrition, intermediary metabolism, lactation, reproduction, and grazing ecology and for the modeling of these processes in Arctic animals, including caribou, reindeer, muskoxen, and moose.

LUTHER S. WILLIAMS

For research on the genetic control of gene expression in bacteria, for mentoring graduate students, and for higher education and Federal-sector science education administration.

THOMAS GORDON WOLCOTT

For research on crustacean physiology and ecology and for technological innovation in biotelemetry and field instrumentation.

RICHARD T. WRIGHT

For pioneering work on the direct detection of microorganisms in the aquatic environment and for further work on microbial populations in estuaries.

LILY Y. YOUNG

For internationally recognized contributions to bioremediation and biodegradation of recalcitrant compounds, particularly in the area of anaerobic degradation processes.

STEPHEN H. ZINDER

For leading advances in the isolation and metabolism of novel, moderately thermophilic methanogens and their potential industrial applications.

SECTION ON CHEMISTRY**ARTHUR W. ADAMSON**

For pioneering the study of the photochemistry of transition element complexes and for investigations on the mechanisms of inorganic reactions.

JOHN W. APSIMON

For brilliant work on natural products chemistry, particularly on the structure and total synthesis of terpenoids and mycotoxins.

THOMAS W. BELL

For work on synthetic methods, molecular recognition, and chemical sensors.

WESLEY G. BENTRUDE

For outstanding work on the chemistry of phosphorus, particularly in the area of phosphoranyl radicals and in the conformational properties of phosphorus-containing molecules of biological and medicinal chemical importance.

JOEL G. BERGER

For work in medicinal chemistry that has led to promising new pharmaceuticals.

STEVEN L. BERNASEK

For well-known studies of chemical reactions on surfaces and energy transfer at surfaces, particularly in the area of heterogeneous catalysis.

MICHAEL T. BOWERS

For studies on laser photodissociation of ion beams and the characterization of semiconductor and metal cluster ions.

EDWIN A. CHANDROSS

For fundamental contributions to organic photochemistry and the technology of photoimaging.

ROBERT N. CLAYTON

For distinguished contributions to spectrometric studies of the isotopic composition of meteorites and lunar and terrestrial rocks, which have shed important light on the origin and evolution of the solar system.

WILLIAM F. DEGRADO

For contributions to the understanding of protein folding, structure, and function through the design of model ion channel peptides, DNA-binding peptides, and metal-binding proteins.

MICHAEL P. DOYLE

For providing leadership in promoting the importance of research in the undergraduate curriculum and for significant contributions to the chemistry of carbenes and catalysis.

JOHN F. ENDICOTT

For fundamental research on the reaction mechanisms of transition metal complexes in their ground and electronic excited states.

THOMAS F. GEORGE

For research in the theory of laser-induced chemical physics, nonlinear optics, molecular collision dynamics, chemical reactions, energy transfer, molecular clusters, and surface and solid-state chemistry and physics.

DAVID G. GORENSTEIN

For significant contributions to the understanding of protein and nucleic acid structure.

MARTHA GREENBLATT

For research in solid state chemistry, especially the synthesis and characterization of transition metal oxides and of fast ion transport materials and superconductors.

SANDRA C. GREER

For influential experimental studies of phase transitions in fluids.

RICHARD H. HIMES

For research in protein structure-function relationships, including enzyme catalysis and cytoskeletal proteins.

DARLEANE C. HOFFMAN

For characterization of spontaneous fission and studies of the nuclear and chemical properties of the heaviest elements, with special contributions to the understanding of heavy ion reactions to produce new radioactive isotopes.

WILLIAM L. JORGENSEN

For significant progress in the application of quantum mechanics, statistical mechanics, and molecular dynamics to the study of organic reactions and biomolecular recognition in solution.

RAOUL KOPELMAN

For fundamental research on energy transport in molecular solids, fractal kinetics, near-field optical microscopy, and submicron optical fiber chemical sensors.

HENRY LINSCHITZ

For fundamental contributions to the photochemistry and photophysics of complex molecules, particularly regarding excited-state redox reactions and energy-dissipative pathways.

CLAUDE F. MEARES

For important discoveries in chemistry involving proteins and metal ions, particularly the remarkable iron-hydrogen peroxide proteolysis reaction, and for original contributions to bioconjugate chemistry.

DANIEL M. NEUMARK

For developing a novel method, based on negative ion photodetachment, to probe the spectroscopy and dynamics of the transition state in chemical reactions.

C. DALE POULTER

For basic contributions to the biosynthesis of isoprenoid compounds, including a definitive study of the enzymes involved in the construction of the carbon framework of isoprenoids.

MARVIN L. POUTSMA

For intellectual leadership and administrative guidance of the Chemistry Division at Oak Ridge National Laboratory during a difficult period of changing missions.

DENNIS P. RILEY

For exceptional applications of fundamental chemistry to the chemical process industry and for leadership in the application of enzyme mimics as medicines.

HOWARD E. SMITH

For excellence in research and teaching in organic chemistry and for contributions toward an understanding of the role of stereochemistry in biological systems.

EDWARD I. STIEFEL

For research in bioinorganic and coordination chemistry of molybdenum, synthesis, and redox of transition metal sulfur complexes of technological significance and for discovery of bacterioferritin.

GALEN D. STUCKY

For research on the synthesis and characterization of main group and early transition metal organometallics and on the interface chemistry of zeolites and mesoporous materials.

KATHLEEN C. TAYLOR

For outstanding research in catalysis, combustion, corrosion, and other important areas and for creative leadership in the research community involving both industrial and academic scientists.

DONALD G. TRUHLAR

For advances in quantum mechanical scattering theory and theoretical kinetics and for applying supercomputational methods to chemical dynamics, energy transfer, potential energy surfaces, and path integrals.

FRANCIS A. VIA

For creative work in catalysis and in the commercial synthesis of alkoxides of metals and metalloids and for outstanding leadership in fostering academic-industrial cooperative research.

GERSHON VINCOW

For studies of the structure and properties of reactive intermediates by electron paramagnetic resonance and for administrative contributions to the research enterprise in academia.

JOHN C. WHEELER

For profound thermodynamic and statistical mechanical studies of phase transitions, phase equilibria, and critical phenomena in molecularly complex solutions and polymerization.

SECTION ON DENTISTRY**RICHARD R. RANNEY**

For research on environmental and genetic factors that influence the subgingival microflora associated with juvenile and adult periodontitis and for teaching and administration in academic dentistry.

SECTION ON EDUCATION**ANGELO COLLINS**

For pioneering research on the assessment of science teaching practice and for leadership in developing national standards for science education.

MARCIA C. LINN

For advancing the understanding of cognitive processes in science, gender differences in science learning, use of educational technology, and systematization of theory in science education.

SHIRLEY M. MALCOM

For work on increasing the options of minority students through science education in the community and for contributions to science education policy.

JOHN STAVER

For dedicated service and leadership in science education and for advocacy and support regarding science education's national agenda of reform in teaching and learning.

SECTION ON ENGINEERING**MIHRAN S. AGBABIAN**

For outstanding leadership in promotion and development of international engineering education.

MELVIN L. BARON

For research in numerical analysis and for innovative approaches for analyzing the large deflection inelastic behavior of complex structures subjected to severe dynamic loadings.

R. P. CAREN

For practical application of space science technologies for the advancement of national security systems and for technical leadership in aerospace and allied industries.

THOMAS KIRK CAUGHEY

For significant research on the theory and behavior of linear and nonlinear systems.

DELORES M. ETTER

For leadership in digital signal processing and for important contributions to engineering education through innovative undergraduate textbooks.

KENNETH F. GALLOWAY

For contributions to understanding radiation effects in semiconductor devices and for leadership in engineering education.

THOMAS K. GAYLORD

For leadership in engineering education and research.

ELMER G. GILBERT

For contributions to theory and practice of multivariable, optimal, nonlinear, and computer control systems and to control engineering education.

GRETCHEN KALONJI

For pioneering theoretical work on the structure and properties of interfaces in crystalline solids and for leadership in undergraduate engineering education reform.

REUVEN R. LEVARY

For contributions to research and teaching in the fields of operations research and management science.

WILLIAM W. MIDDLETON

For professional and technical society activities with significant contributions to the field of ethics and professional responsibility.

RICHARD SKALAK

For research in the rheology of blood and blood cells, particularly mathematical modeling of passive and active behavior of cellular processes.

EDWARD J. SMITH

For outstanding contributions to engineering education and research.

LAWRENCE TALBOT

For distinguished contributions to rarefied gas dynamics, fluid dynamics diagnostic techniques, physiological fluid mechanics, and turbulent combustion.

DAVID KEITH TODD

For significant contributions to the field of ground water hydrology as a researcher, teacher, and consulting engineer.

WON T. TSANG

For pioneering work in the development of quantum well lasers and epitaxial growth processes.

MAX L. WILLIAMS, JR.

For original and sustained contributions to the field of fracture mechanics.

PAUL A. WITHERSPOON

For pioneering work in geothermal engineering, underground storage, hydrogeology, and flow of fluids in fractured and porous rocks.

AARON D. WYNER

For contributions to information theory and its applications in communications and cryptography.

SECTION ON GENERAL INTEREST IN SCIENCE AND ENGINEERING**SHARON DUNWOODY**

For seminal studies on, and leadership in the teaching of mass media coverage of science and technology.

GERALD J. IAFRATE

For administrative and technical leadership and for contributions to the theory of ballistic transport and Bloch oscillations in semiconductors.

SECTION ON GEOLOGY AND GEOGRAPHY**THOMAS J. AHRENS**

For pioneering research on the high pressure properties of earth materials, shock wave metamorphism of minerals, planetary crater mechanics, and evolution of atmospheres.

DAVID W. FOLGER

For research in marine geology and geophysics.

CHARLES G. GROAT

For contributions to the use of the results of research in resources and environmental policy development and decision making and to earth science education.

JOHN P. GROTZINGER

For creative application of the principles of sedimentology and sequence stratigraphy to resolution of major features of Laurentian Precambrian sedimentary history.

ROBERT M. HAZEN

For distinguished contributions to mineral physics, high-pressure research, the history of science, and the public understanding of science.

DANA J. ISHERWOOD

For outstanding service to the earth science community through effective liaisons with Congress as a spokesperson for research and for dedicated and thoughtful contributions to the AAAS Section on Geology and Geography and the Association.

ANDREW H. KNOLL

For outstanding contributions to improved understanding of evolution and environmental change on the early Earth.

MALCOLM C. MCKENNA

For research and exploration in vertebrate paleontology and for teaching at the graduate level.

LOUIS C. PELTIER

For pioneering work in the applications of geography and environmental sciences, particularly in climatic geomorphology.

SECTION ON HISTORY AND PHILOSOPHY OF SCIENCE**RICHARD M. BURIAN**

For research and publication in the history and philosophy of science; for service to the Philosophy of Science Association and the International Society for History, Philosophy, and Social Studies of Biology; and for academic administration.

JOHN C. BURNHAM

For pioneering research that has broadened work in the history of psychiatry, psychology, medicine, and American science.

LINDLEY DARDEN

For research in the history and philosophy of biology and for service to efforts by the Philosophy of Science Association and the International Society for History, Philosophy, and Social Studies of Biology to integrate historical and philosophical studies of biology.

PHILIP J. PAULY

For influential research in the history of biology and psychology and for influential work on the history of science in American society.

EDITH DUDLEY SYLLA

For research in late medieval natural philosophy and early modern science; for service to the AAAS Section on History and Philosophy of Science, the Medieval Academy of America, and the History of Science Society; and for academic administration.

SECTION ON INDUSTRIAL SCIENCE**WILLIAM R. DILL**

For scholarly contributions to the administration of technologically oriented organizations, to the international transfer of educational processes for management of technology, and to the use of computer technology in management education.

SECTION ON INFORMATION, COMPUTING, AND COMMUNICATION**PAUL BARAN**

For innovative and visionary work in the evolution of computer-communication technology for human use, including a role in the founding of the Institute for the Future.

BRUCE I. BLUM

For pioneering the design and implementation of information systems for health care professionals, including clinical management of oncology patients a quarter of a century ago.

JACK DONGARRA

For contributions to state-of-the-art mathematical software and its distribution through the development of netlib and for unifying the concept of parallel computing.

ALBERT L. HOPKINS, JR.

For innovations in conceiving and developing highly reliable computer systems, including the Apollo on-board guidance computers, and for technological leadership at the C. S. Draper Laboratory.

SUSANNE M. HUMPHREY

For research and professional contributions in the area of information science, particularly in knowledge-based expert systems, database indexing, and information retrieval.

JOYCE CURRIE LITTLE

For pioneering work on advancing associate degree curriculum development in the computing sciences and for service to enhance educational and professional standards of computer personnel through the certification programs of professional associations.

KURT L. LOENING

For international achievements in the area of chemical nomenclature, including efforts in support of standardizing terminology to improve scientific communication.

SECTION ON LINGUISTICS AND LANGUAGE SCIENCE**KENNETH L. HALE**

For theoretical and descriptive research on a wide variety of the world's languages, for efforts on behalf of communities where those languages are spoken, and for cultural preservation efforts in support of the Native Australian and Native American languages of North and Central America.

SECTION ON MATHEMATICS**ELLIOTT H. LIEB**

For fundamental contributions to mathematics and mathematical physics.

RICHARD M. SCHOEN

For original work leading to the solution of outstanding problems in differential geometry and relativity.

FREDERIC Y. M. WAN

For fundamental research contributions to plate and shell theory and its applications and for exemplary service to his profession.

FRANK WARNER, III

For fundamental work on the conjugate locus, prescribing curvature, the classification of Blaschke manifolds, and fibrations of spheres, and for outstanding professional leadership.

SECTION ON MEDICAL SCIENCES**ITAMAR B. ABRASS**

For leadership in the development of academic geriatric medicine programs and in the definition of the molecular pharmacologic mechanisms of myocardial beta-adrenergic responsiveness in aging.

ROY E. ALBERT

For outstanding research on the mechanisms of carcinogenesis.

HENRY A. ANDERSON

For outstanding contributions to studies of the health effects of occupational and environmental exposures and to the advancement of environmental public health.

MARJORIE E. ANDERSON

For fundamental research on the neural control of movement, particularly for studies of the basal ganglia, and for interfacing between basic and applied medical sciences.

WILLIAM AMES ATCHLEY

For substantial contributions to an international network in bioethics.

J. THOMAS AUGUST

For contributions to immunopharmacology, including cell surface proteins.

ROBERT L. BARCHI

For outstanding interdisciplinary research in clinical and basic neuroscience.

J. RICHARD BARINGER

For research in viral diseases of the nervous system and mechanisms of viral latency.

CLYDE F. BARKER

For basic and clinical research on the biology of rejection of transplanted organs and for pioneering studies on the immunopathogenesis of diabetes and its prevention.

CLAUDIO BASILICO

For contributions to understanding the molecular mechanisms of cell proliferation and carcinogenesis and to tumor virology.

GILBERT W. BEEBE

For innovative programmatic and methodologic contributions to medical follow-up studies and for research in radiation epidemiology.

KATHERINE L. BICK

For contributions to research on Alzheimer's disease and other degenerative disorders of the nervous system.

PAUL H. BLACK

For pioneering studies in viral transformation, the discovery of SV40 T antigen and shedding of cancer cell surface proteins, and for research on the effects of stress on the immune system.

EDWARD N. BRANDT, JR.

For leadership in academic medicine and public health and for outstanding service in the federal government.

PETER H. BYERS

For research on the genetics, molecular biology, and biochemistry of hereditary connective tissue disorders.

ANTONIO CAO

For scientific and organizational efforts in eradicating thalassemia major in Sardinia.

STERLING K. CLARREN

For outstanding contributions to the understanding of clinical and pathological features of fetal alcohol syndrome.

MAX D. COOPER

For sustained and insightful research into lymphocyte differentiation pathways, particularly the fundamental processes of B-cell ontogeny and function.

PELAYO CORREA

For research on the etiology of gastric cancer.

LUCIO G. COSTA

For outstanding research in neurotoxicology, particularly on cell signalling and the cholinergic system.

NORMAN DAVIDSON

For diverse contributions to biophysical chemistry and its applications to biology and medicine.

ROBERT W. DAY

For leading the Fred Hutchinson Cancer Research Center to worldwide prominence and for guiding the national cancer program as a member of the National Cancer Advisory Board.

ERIK DE CLERCQ

For developing new chemotherapeutic approaches for the treatment of virus infections, AIDS, and cancer and for elucidating the molecular targets for this chemotherapeutic intervention.

ROGER DETELS

For epidemiologic studies integrating laboratory approaches to defining the natural history of Human Immunodeficiency Virus.

DAVID L. EATON

For outstanding contributions to the understanding of the biochemical mechanism responsible for the perplexing and dramatic species differences in susceptibility to aflatoxin-induced liver cancer.

NELSON FAUSTO

For research on the regulation of liver regeneration by protooncogenes and growth factors and for the isolation and characterization of liver stem cells.

PETER J. FISCHINGER

For scientific leadership in developing early strategies for confronting AIDS and in facilitating the development and implementation of a sensitive and specific HIV blood test.

THEODORE FRIEDMANN

For pioneering the concept of human gene therapy and for technical advances that have led to that new form of medicine.

MURRAY B. GARDNER

For discovering various animal models of retrovirus infection critical to understanding pathogenesis and preventive vaccine approaches.

THOMAS D. GELEHRTER

For contributions to human biochemical and medical genetics.

PHILIPPE GRANDJEAN

For significant contributions to understanding the neurotoxicity of lead in human populations.

ROBERT G. GROSSMAN

For outstanding clinical research in the neurosciences.

JEFFREY B. HALTER

For research on energy metabolism in aging, particularly insulin secretion and action and the influence of the sympathetic nervous system on these parameters.

HERBERT A. HAUPTMAN

For the development of direct methods for the determination of molecular and crystal structures using the technique of X-ray crystallography.

DAVID D. HO

For molecular biologic and virologic studies of the HIV virus which have provided a fundamental insight into the role of virus load in AIDS pathogenesis.

WAUN KI HONG

For pioneering research using retinoids for cancer chemoprevention and for innovative therapeutic strategies to avoid radical surgery and preserve the larynx in laryngeal cancer patients.

MICHAEL M. KABACK

For pioneering community-based education/carrier screening/genetic counseling programs for the prevention of Tay-Sachs disease, resulting in a dramatic reduction in worldwide incidence of this lethal hereditary disorder.

C. RONALD KAHN

For seminal research on the molecular mechanism of insulin action and the biochemical and genetic basis of diabetes mellitus.

STEPHEN M. KRANE

For biochemical and clinical studies of Paget's disease and metabolic bone diseases and for the discovery of metalloproteinases and cytokines in joint destruction in rheumatoid arthritis.

MARTIN J. KUSHMERICK

For integrating the principles of biochemical energy balance and metabolic regulation in muscle contraction and for applications of NMR spectroscopy.

JOHN A. H. LEE

For outstanding contributions to the understanding of the epidemiology of melanoma.

JOHN D. LOESER

For outstanding contributions to the understanding of human pain syndromes and their control.

HERBERT A. LUBS

For discovery of the Fragile X Syndrome.

RONALD V. MAIER

For investigation of the molecular control of the macrophage in inflammation and critical illness and for efforts to reverse society's nihilistic attitude toward trauma prevention.

ALFRED F. MICHAEL

For pioneering studies of kidney disease in children.

WALTER L. MILLER

For seminal contributions to the molecular biology of steroid hormone synthesis, including cloning genes for steroidogenic enzymes and characterizing their regulation and genetic disorders.

NORMAN KARLE MOTTET

For research on the mechanism of biologic effects of methylmercury, especially subcellular binding to microtubules in mitotic spindles and astrocyte changes in the nervous system following long-term low level exposure.

DANIEL W. NEBERT

For many contributions to the fields of pharmacogenetics, the cytochrome P450 gene nomenclature system, evolution of drug-metabolizing enzymes, carcinogenesis, and environmental toxicology.

WILLIAM E. PAUL

For outstanding contributions to the field of immunology.

ARTHUR L. REINGOLD

For outstanding contributions to studies of infectious diseases in human populations.

CLAYTON RICH

For outstanding contributions to the understanding of calcium metabolism and metabolic bone disease and for leadership in academic medicine.

ROBERT M. SCHMIDT

For research, teaching, and patient care in gerontology, hematology, and preventive medicine; for services to professional societies; and for communicating science to the public.

LARRY J. SHAPIRO

For many contributions to biochemical and molecular human genetics and reproductive biology.

WILLIAM S. SLY

For pioneering contributions to the understanding of lysosomal enzyme transport and to the biochemistry and genetics of the mucopolysaccharidoses and other inborn errors of metabolism.

ARNOLD L. SMITH

For research on the pathogenesis of Hemophilus meningitis, Pseudomonas infections in cystic fibrosis, and antibiotic pharmacokinetics, all of which have significantly reduced childhood morbidity/mortality.

THOMAS J. SMITH

For substantial contributions to environmental exposure assessment in human populations.

LOUISE C. STRONG

For outstanding contributions to the genetic epidemiology of childhood cancers.

G. MARIE SWANSON

For outstanding contributions to cancer epidemiology.

DAVID B. THOMAS

For outstanding contributions to the understanding of the epidemiology of common cancers throughout the world.

HAROLD E. VARMUS

For basic contributions to the discovery and understanding of oncogenes.

PETER C. WHYBROW

For research on the psychobiology of affective disorders, particularly pharmacology and endocrinology of bipolar disorder.

ROBERT W. WISSLER

For pioneering studies of the pathogenesis, progression, and regression of atherosclerosis in experimental animals, *in vitro*, and in young people.

**SECTION ON
PHARMACEUTICAL
SCIENCES****RONALD T. BORCHARDT**

For major contributions in several significant areas as diverse as design of selective enzyme inhibitors useful as antiviral agents to fundamental studies of mechanisms involved in the transport of protein drugs across biological membranes.

LAWRENCE L. FLECKENSTEIN

For research on the development of new chemotherapeutic agents for the treatment of malaria, leishmaniasis, and onchocerciasis.

ROBERT P. HANZLIK

For research on the mechanisms of drug metabolism and toxicity, particularly in the formation and disposition of chemically reactive metabolites of bromobenzene and the elucidation of mechanisms of aromatic and aliphatic hydroxylation.

KUO-HSIUNG LEE

For outstanding contributions in medicinal chemistry of bioactive natural products and synthetic analogs, including antitumor and anti-AIDS agents and Chinese medicine.

GERALD S. MARKS

For work at the interface of chemistry and pharmacology, particularly in porphyrin biosynthesis and on the mechanisms of action of nitrate vasodilators.

ARTHUR A. PATCHETT

For leadership in drug discovery and development programs in the pharmaceutical industry, particularly for cardiovascular drugs.

LANCE R. POHL

For research on immune mechanisms of drug-induced allergic reactions and on the identification and characterization of liver cell proteins that become modified by reactive metabolites formed from drugs.

SECTION ON PHYSICS**WOLFGANG J. CHOYKE**

For outstanding research on the properties and applications of semiconductors and for dedicated service in strengthening bridges to applied physics.

JAMES J. DUDERSTADT

For many contributions to physics and its applications and for unique and important work in education in the sciences and humanities.

STEPHEN E. HARRIS

For important research in the development of lasers and their use in physics and engineering.

WILLIAM L. KRAUSHAAR

For development of pioneering detectors and detection techniques for very high energy particles and photons, including the first extra-solar-system gamma rays.

BERNDT MUELLER

For contributions to theoretical nuclear physics, including quantum electrodynamics of strong fields and relativistic heavy ion collisions.

JAY OREAR

For many contributions to the development of particle physics and for important work addressing the problems of science and society.

RICHARD F. POST

For pioneering research in the physics and confinement of plasma that has added significantly to the development of controlled thermonuclear fusion.

THOMAS D. ROSSING

For leadership in physics education, for research in musical acoustics and applied magnetism, and for conveying physics to the public through numerous lectures and books.

JONAS SCHULTZ

For varied contributions to elementary particle physics, including investigations of proton-antiproton interactions, and for his role in graduate education and the support of physics research.

H. EUGENE STANLEY

For contributions to statistical mechanics, critical phenomena, percolation theory, water structure, and applications of scaling and renormalization group theory to polymer physics.

ROBERT H. SWENDSEN

For contributions to statistical mechanics and the development of new algorithms for the numerical simulation of statistical mechanical systems.

ALVIN V. TOLLESTRUP

For scientific and technical leadership in the development of the world's highest energy proton-antiproton collider, the Tevatron, and one of its associated detectors, the Collider Detector.

RICHARD F. WALLIS

For research on atomic vibrations at crystal surfaces and for the discovery of microscopic surface modes in diatomic crystals.

MICHAEL S. WITHERELL

For many brilliant accomplishments in particle physics, notably for seminal work on charm meson decay processes and studies of double beta decay.

SECTION ON PSYCHOLOGY**EDWARD H. ADELSON**

For distinguished work in visual system psychophysics.

JOHN C. DEFRIES

For creative research on the influence of genetic factors on human behavioral characteristics.

CARL R. GUSTAVSON

For original comparative research on food selection, especially studies on the development of nonlethal wildlife management methods and the role of hormones in eating disorders.

FRANCES DEGEN HOROWITZ

For pioneering studies on the behavior of very young infants, particularly neonatal behavior and visual attention, as well as analysis and synthesis of developmental theory.

RAJA PARASURAMAN

For theoretical, empirical, and applied research on sustained attention and cognitive neuroscience.

GEORGE VINCENT REBEC

For research on the neuronal mechanisms underlying the behavioral effects of stimulant and antipsychotic drugs.

DANIEL REISBERG

For pioneering studies on the nature of mental imagery, both visual and auditory, and on the effects of emotion on human memory.

RICHARD J. ROSE

For research on behavioral genetics and genetic epidemiology.

WALTER SCHNEIDER

For research on the nature of human learning, the effects of extended practice, and the distinction between attention demanding and overlearned, automatic responding.

JOSEPH L. YOUNG

For outstanding administrative service to the National Science Foundation in providing support for quality research in mathematical, experimental, and cognitive psychology.

**SECTION ON SOCIAL,
ECONOMIC, AND
POLITICAL SCIENCES****JOHN BONGAARTS**

For outstanding leadership in formal demography, especially in modeling the role of determinants of fertility change in developing countries.

ROBERT T. MICHAEL

For research in economics of the family, particularly investments in children, family structure and stability, and nonmarket effects of education, and for leadership in survey research.

JULIAN L. SIMON

For research on the relationships between population, economic activity, and resource exhaustion and for sharpening debates on this important topic.

PAUL C. STERN

For a cumulative body of interdisciplinary research that, while devoted to major national policy issues, has been theoretically rigorous and innovative and for leading the social sciences toward attention to problems of global environmental change.

TERESA A. SULLIVAN

For promoting research and undergraduate training in demography and sociology of work, economy, and society.

**SECTION ON SOCIETAL
IMPACTS OF SCIENCE AND
ENGINEERING****ARTHUR L. CAPLAN**

For important contributions to the field of biomedical ethics and for leadership in communicating results from this research to public and professional groups.

SUSAN E. COZZENS

For research and editorial leadership in science and technology studies, science policy studies, and the international evaluation of research and development.

PENNY J. GILMER

For innovative research and teaching on how to bring science and technology, particularly ethics in science, to students and the community.

ANDREW N. ROWAN

For outstanding efforts to facilitate discussion and greater understanding of the ethical and social dimensions of animal and human relationships and to encourage research and improved understanding of the biological bases of sentience.

VIVIEN WEIL

For creativity and persistence in organizing research and education on important areas of ethical concern, including engineering ethics, intellectual property, and secrecy in science.

SECTION ON STATISTICS**JONAS H. ELLENBERG**

For highly influential contributions to public health research, especially in the area of etiology, prognosis, and prevention of neurological disorders.

MITCHELL H. GAIL

For methodological research and statistical applications in medical science.

WILLIAM MICHAEL O'FALLON

For outstanding achievements in collaborative medical research, for direction of a strong collaborative statistics program in a medical environment, and for substantial service to the statistical profession.

C. RAMAKRISHNA RAO

For pioneering contributions to several areas of statistical theory and applications, including multivariate analysis, characterization of probability distributions, and singular matrices.

TERENCE PAUL SPEED

For research in applied and theoretical statistics, particularly on problems of biology, risk assessment, experimental design, and contingency table analysis.

JON A. WELLNER

For seminal research on empirical processes and semi-parametric inference and for outstanding contributions to graduate education in biostatistics and statistics.

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*The rosette was adopted by the Board of Directors
on December 2, 1989 to commemorate the
establishment of AAAS Fellows in 1874.*

*Since that time, AAAS has recognized the
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