

# AAAS Annual Meeting

*Chicago, 14–18 February 1987*

## Preconvention Program

**W**hy come to the AAAS Annual Meeting? What's in it for you? Well, we asked those who attended our recent Annual Meeting in Philadelphia why they came. Three-quarters came for one of three reasons: to learn things in their own fields, to learn things in other fields, or to present information; in sum, to engage in the communications process of science.

Who were these people? Again, three-quarters were in the three major subdivisions of science: life sciences, physical and mathematical sciences, and social and behavioral sciences. These same areas comprise the three major divisions of the Chicago Meeting Program, which is spread out for you over the next several pages. I am sure that you, too, will find many things to learn in your field and many more things to learn in other fields.

Come and see what you have been missing. Hear, firsthand, eleven eminent scientists from around the world deliver major plenary lectures. Attend sessions on topics on the frontiers of physics, astronomy, ecology, molecular biology, neuroscience, anthropology, economics, sociology, and psychology. Consider the implications of science for the environment, biomedical ethics, education, population and food, and arms control and security.

Learn for your own sake, but consider the whole warp and woof of the fabric of science and its relationship with society as a whole.

In addition to the symposia, we have a variety of special workshops, a special three-day seminar for researchers in neuroscience featuring the research leaders in that field [if you register for that seminar, you can still deliver a poster-session paper on your own neuroscience research at the Meeting, if you send it in quickly], exciting tours of Chicago's many scientific attractions, a Film Festival of the best science films of the past year, and a major Science and Technology Exhibition.

For your comfort and convenience, all Meeting activities will be held in a single location—the Hyatt Regency Chicago. This modern convention facility is connected underground to the Illinois Center, an indoor mall featuring many fine shops and restaurants. You can reserve a room at the Hyatt at the special AAAS Meeting discount, travel to Chicago via United or Delta airlines at the special AAAS Meeting discount, and spend a week in February basking in the warmth of intellectual stimulation. Just fill out the forms at the end of the program which follows. We look forward to seeing you there.—ARTHUR HERSCHMAN

## Plenary Lectures

### **Keynote Address: Killing Our World** (Sat., 8:30 p.m.).

PETER HAMILTON RAVEN (*Director, Missouri Botanical Garden, and Engelmann Professor of Botany, Washington University, St. Louis, MO*).

### **Neuroscience Seminar Keynote: Multiple Receptors for Multiple Messengers** (Sun., 1:15 p.m.).

SOLOMON H. SNYDER (*Director, Department of Neuroscience, Johns Hopkins University School of Medicine, Baltimore, MD*).

### **Environment and Genetic Variations in Indian Populations** (Sun., 1:15 p.m.).

ARCHANA SHARMA (*General Secretary, Indian Science Congress Association, Calcutta, India*).

### **The Ghetto Underclass and the Social Transformation of the Inner City** (Sun., 8:30 p.m.).

WILLIAM J. WILSON (*Chairman, Department of Sociology, University of Chicago, Chicago, IL*).

### **George Sarton Memorial Lecture: Is the Science of Today Like the Science of the Past?** (Mon., 1:15 p.m.).

FREDERIC L. HOLMES (*Professor, Yale University School of Medicine, New Haven, CT*).

### **Biophysical and Molecular Records of Associative Memory** (Mon., 1:15 p.m.).

DANIEL L. ALKON (*Head, Section on Neural Systems, NIH Laboratory of Biophysics, Marine Biological Laboratory, Woods Hole, MA*).

### **The Two Cultures: Biology and Chemistry** (Mon., 8:30 p.m.).

ARTHUR KORNBERG (*Professor of Biochemistry, Stanford University School of Medicine, Stanford, CA*).

### **What Would a Good U.S.–Soviet Relationship Look Like? And How Do We Negotiate One?** (Tue., 1:15 p.m.).

ROGER FISHER (*Williston Professor of Law and Director of Harvard Negotiations Project, Harvard University, Cambridge, MA*).

### **The History of Lobotomy: A Cautionary Tale** (Tue., 1:15 p.m.).

ELLIOT S. VALENSTEIN (*Professor of Psychology and Neuroscience, University of Michigan, Ann Arbor, MI*).

### **AAAS President's Address: How Much Science Is Enough?** (Tue., 8:00 p.m.).

LAWRENCE BOGORAD (*AAAS President and Maria Moores Cabot Professor of Biology, Harvard University, Cambridge, MA*).

### **Human Capital for Science-Driven Development in Africa** (Wed., 1:15 p.m.).

THOMAS R. ODHIAMBO (*Director, International Center of Insect Physiology and Ecology, Nairobi, Kenya*).

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# I. Physical Sciences and Technology

## Frontiers of the Natural Sciences

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**10-1. Frontiers of the Natural Sciences, 1987** (Sun., a.m./p.m.). Fractal patterns; applications of NMR; earthquakes in the Midwest; Halley's Comet; turbulence and numerical simulations; design in evolution.

ROLF M. SINCLAIR, RICHARD S. NICHOLSON, LEO P. KADANOFF, JOHN D. ROBERTS, DON STEEPLES, SUSAN WYCKOFF, CIPRIAN FOIAS, MICHAEL LABARBERA

## Mathematics

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**11-1. Ramanujan's Centenary: His Legacy to Mathematics** (Sat., p.m.). Science in India; notebooks; approximations to  $\pi$ ; hard hexagon model.

RICHARD A. ASKEY, SUBRAHMANYAN CHANDRASEKHAR, BRUCE BERNDT, PETER BORWEIN, GEORGE E. ANDREWS, PETER FORRESTER

**11-2. Knotting Phenomena in the Natural Sciences** (Mon., a.m.). DNA knots and catenanes; closed circular DNA; molecular graphs; spatial knotting and linking.

KENNETH C. MILLETT, NICHOLAS R. COZZARELLI, JAMES H. WHITE, DAVID WALBA, DE WITT SUMNERS

**11-3. Some Mathematical Questions in Biology: Population Models** (Wed., a.m./p.m.). Social learning; migration and selection; population genetics models; plasmids in bacterial populations; environment and competition; nonlinear ecology.

ALAN M. HASTINGS, ROBERT BOYD, THOMAS NAGYLAKI, BRUCE R. LEVIN, PETER L. CHESSON, WILLIAM M. SCHAFER

## Computing

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**12-1. Computers in Brain Research: Where Are the Frontiers?** (Sat., p.m.).

JOHN M. GIBSON, CHARLES E. MOLNAR, DONALD J. WOODWARD, ANDRAS PELLIONISZ, JAMES ALBUS, TERRENCE J. SEJNOWSKI

**12-2. Computer Graphics and Dynamical Systems** (Mon., p.m.). Mathematics of images; four-dimensional phenomena; complex boundaries; chaotic dynamics.

ROBERT L. DEVANEY, MICHAEL F. BARNSLEY, JOHN H. HUBBARD, HEINZ-OTTO PEITGEN

**12-3. Computer Programs That Reason and Learn** (Tue., a.m.). Automated reasoning; machine learning; heuristic search; genetic algorithms; neural networks.

MICHAEL R. HILLIARD, LARRY T. WOS, TOM M. MITCHELL, GARY BRADSHAW, CHRISTOPHER J. MATHEUS

**12-4. Imprecision and Expert Systems** (Tue., p.m.). Search for randomness; algorithms; conditional independence.

EDWARD J. WEGMAN, NOZER SINGPURWALLA, PERSI W. DIACONIS, ANDREW P. SAGE, GLENN R. SHAFER, STEPHEN M. SAMUELS

## Physics & Astronomy

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**13-1. The Origin of Planetary Systems** (Sat., p.m.). Early solar system; cometary nuclei; young stellar objects; proto-planetary systems; Copernican revolution.

JURGEN H. RAHE, EDWARD ANDERS, MICHAEL J. S. BELTON, STEPHAN E. STROM, DAVID C. BLACK

**13-2. Inside the Sun** (Sun., a.m.). Nearest star; solar neutrino problem; helioseismology.

JAY M. PASACHOFF, EUGENE N. PARKER, JOHN N. BAHCALL, ROBERT W. NOYES

**13-3. Particle Physics and Cosmology: Converging Frontiers of Science** (Mon., a.m./p.m.; Tue., a.m./p.m.). Large-scale structure; galaxies, voids, filaments, and bubbles; galaxy formation; cosmic strings; small-scale structure; particles and forces; Fermilab collider; unified theory; cosmic inflation; quantum origin; large research projects; economic impact; cultural impact; future large facilities; particle physics and astronomy.

EDWARD W. KOLB, MARGARET J. GELLER, JOEL PRIMACK, NIEL TUROK, MARTIN L. PERL, CHRIS QUIGG, JOHN PEOPLES, DAVID J. GROSS, MICHAEL S. TURNER, JAMES B. HARTLE, DAVID MOWERY, W. EDWARD STEINMUELLER, LEON M. LEDERMAN, ROBERT H. SIEMANN, GEORGE B. FIELD, ROLF M. SINCLAIR, ROGER H. HILDEBRAND, JAMES D. BJORKEN, LAURA P. BAUTZ

**13-4. Low-Dimensional Materials** (Wed., a.m./p.m.). Modeling via supercomputers; superlattices; amorphous semiconductors; magnetic monolayers; quasicrystals; organic synthetic metals; hybrid superlattices; matrix-isolated clusters.

FRANK Y. FRADIN, RALPH SIMMONS, ARTHUR J. FREEMAN, IVAN K. SCHULLER, HELMUT H. FRITSCH, MYRON SALAMON, HARTMUT ZABEL, JACK M. WILLIAMS, GUSTAF ARRHENIUS, GOPAL K. SHENOY

## Space Science & Technology

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**14-1. Prospects for the Space Program: One Year After Challenger** (Sat., p.m.; Sun., a.m.; Mon., a.m./p.m.). Space commercialization; macroeconomic impact; NASA's activities; communications and transportation; materials processing; investment opportunities; policymakers' forum; reconstituting the space program; policy options; space station; NASA's plans; military plans; new directions; Space Age continuation; the future; citizens' study; space frontier; the moon; exploring Mars; long-term prospects.

JOHN M. LOGSDON, FRANK BERNARDINO, ISAAC GILLAM IV, T. ALLAN MCARTOR, JOHN EGAN, WILLIAM CLAYBAUGH, GERALD MAY, RICHARD JOHNSON, ROBERT BRUMLEY, KENNETH PEDERSEN, PETER PERKINS, TERRENCE FINN, ALAN LADWIG, STANLEY ROSEN, ALEXA ROLAND, JOHN PIKE, ANN FLORINI, MARCIA SMITH, WENDELL W. MENDELL, LOUIS FRIEDMAN, GORDON WOODCOCK, AARON GELLMAN

**14-2. Future of the Space Sciences in the United States** (Sun., p.m.). The twenty-first century; astronomy in space; space and

earth sciences; solar system; NASA's program.

JAMES A. VAN ALLEN, THOMAS M. DONAHUE, RICCARDO GIACCONI, LOUIS J. LANZEROTTI, DAVID MORRISON, FRANK B. McDONALD, JOEL D. GOLDHAR

## Technology & Industry

### 15-1. High-Tech Quality for High Technology (Sun., a.m.).

A. BLANTON GODFREY

**15-2. Industrial Disasters and Emergency Management: Present and Future** (Sun., p.m.). Community right to know; corporate management response; chemical emergencies; nuclear emergency; after Chernobyl.

BRANDEN B. JOHNSON, BARRY L. RUBIN, JAMES MAKRIS, C. GARY LOPEZ, KATHLEEN J. TIERNEY, ROBERT WILKERSON, ROBERT GOBLE, ROGER E. KASPERSON, CHRISTOPH HOHENEMSER

**15-3. Factory Automation in the Rust Belt: Case Studies of Chicago Manufacturing** (Tue., a.m.). Top management perspectives; competing with the Japanese; design and manufacturing; implementing.

THEODORE W. SCHLIE, JOEL D. GOLDHAR, ROBERT G. VANDER HOONING, GRANT T. HOLLETT, JR., THOMAS J. LINDEM, JOHN E. DICK

**15-4. The Future of the Automobile** (Tue., p.m.). Bodies and powertrains; electronics; materials.

SERGE GRATCH, MOUNIR M. KAMAL, JEROME G. RIVARD, HARRY E. COOK

**15-5. Civilizing the Automobile of the Future** (Wed., a.m.). High costs of regulating; emissions controls; mandatory belt laws; pollution standards; safer vehicles.

LESTER B. LAVE, ROBERT W. CRANDALL, HOWARD K. GRUENSPECHT, JOHN D. GRAHAM, M. GRANGER MORGAN, RICHARD C. SCHWING

**15-6. Federal Research Policy and Technological Innovation: The Case of Fiber Optics** (Wed., p.m.). University perspective; industrial perspective; NSF perspective; DOD/Navy perspective; basic research and innovation.

W. HENRY LAMBRIGHT, ALBERT H. TEICH, GREGORY E. STILLMAN, ROBERT D. MAURER, ELIAS SCHUTZMAN, MARTIN L. MUSSELMAN, EVA M. PRICE, GEORGE A. HAZELRIGG

## Climate

**16-1. Review of the 1977-87 Decade of Action to Combat Desertification** (Tue., a.m.). International efforts; social and institutional factors; climatic aspects; surface processes.

CAROL S. BREED, PRISCILLA REINING, BILL L. LONG, NOEL BROWN, HANNA CORTNER, MICHEL VERSTRAETE, CYRUS MCKELL

**16-2. Atmospheric Sciences: Climatology and Weather Information in Agriculture and Forestry** (Tue., p.m.). Responding to drought; farm needs; future prospects; assessing weather needs.

JOHN F. GERBER, DONALD A. WILHITE, MICHAEL J. FRITSCH, KATHARINE B. PERRY, WILLIAM D. BONNER, RAY E. JENSEN

**16-3. Climatic Variability and Impacts on U.S. Water Resources** (Wed., p.m.). Water policy and science; hydrology; agri-

cultural forecasting; statistical methods; levels of Lakes Michigan and Huron.

MARSHALL E. MOSS, CHARLES F. COOPER, PETER S. EAGLESON, WILLIAM E. EASTERLING, NORTON D. STROMMEN, JOHN C. SCHAAKE, CURTIS E. LARSEN, ROGER REVELLE

## Environment—Nuclear

**17-1. Perspectives on the Accident at Chernobyl** (Sun., p.m.). Historical roots; reporting the news; lessons for U.S.; geopolitical dimensions.

PATRICIA BLISS MCFATE, PAUL R. JOSEPHSON, BILL KURTIS, MILES LEVERETT, ROBERT PETER GALE, INGEMAR LINDAHL

**17-2. Is Nuclear Winter Real and Relevant?** (Mon., a.m./p.m.). Climate implications; strategic implications.

S. FRED SINGER, GEORGE F. CARRIER, JOYCE E. PENNER, STEPHEN H. SCHNEIDER, JONATHAN I. KATZ, GEORGE RATHJENS, ROBERT EHRLICH, JEREMY J. STONE, WILMOT N. HESS

**17-3. Disposal of High-Level Nuclear Waste: Technical and Socio-political Realities** (Tue., a.m./p.m.). Policy concerns; federal program; technical basis; indigenous peoples; mobilizing citizens; knowledge base; multi-attribute theory; hydrological/geological concerns; defense wastes and toxic chemicals; economic implications; health and safety risks.

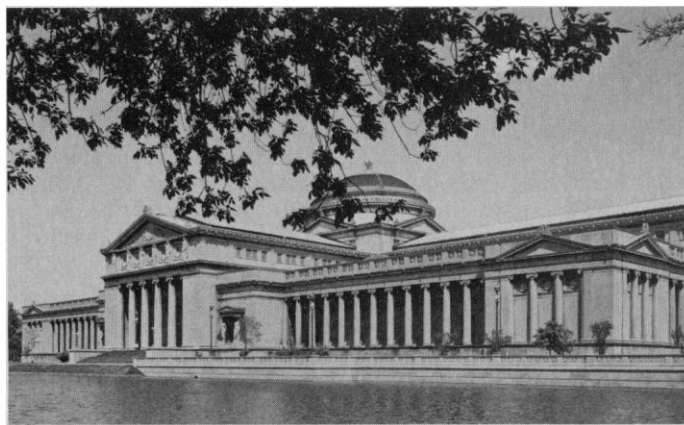
PHILIP L. BEREANO, ESTELLA LEOPOLD, BERNARD RUSCHE, CURT ESCHELS, RUSSELL JIM, GERALD POLLETT, SHIRLEY HANKINS, THOMAS LESCHINE, DALLAS PECK, ROBERT ALVAREZ, DUANE CHAPMAN, BARUCH FISCHOFF

**17-4. Nuclear Waste Disposal: A Challenge for Science and Public Policy** (Wed., a.m.). Consensus about risks; geotechnical uncertainty; social impacts; perception of risks; expert knowledge and social acceptability.

JOHN A. GERVERS, THOMAS A. COTTON, DAVID PENTZ, ROGER E. KASPERSON, PAUL SLOVIC, DETLOF VON WINTERFELDT

## Environment—Chemical

**18-1. Hazardous Waste Management: Current Regulatory and Compliance Environment** (Sat., p.m.; Sun., a.m./p.m.).



Museum of Science and Industry. (Courtesy of the Museum of Science and Industry).

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Congressional viewpoint; Superfund; DOD compliance; industrial perspective; liability insurance; groundwater impact; incineration, deep well injection; chlorinated dioxins; epidemiologic studies; exposure to 2,3,7,8-TCDD; economics of regulation; risk perception and communication; siting models; ocean incineration; public cooperation; public involvement.

PHILIP F. GUSTAFSON, R. GARY WILLIAMS, PHILIP CUMMINGS, DAN BECKER, DENNIS F. NAUGLE, GEORGE VANDER VELDE, WILLIAM W. SUTTLE, ROBERT A. GRIFFIN, FRANK H. LAWRENCE, DON L. WARNER, ARNOLD SCHECTER, JAMES RUTTENBER, PAUL A. STEHR-GREEN, ALAN SCHNAIBERG, VINCENT COVELLO, RABEL BURDGE, CONNER BAILEY, CHARLES E. FAUPEL, RICHARD BORD, STANLEY BLACK, PHILIP E. LAMOREAUX, JOSEPH MOLNAR

**18-2. The Changing Science of Acid Rain and Its Effects** (Wed., a.m.). Rain and snowfall chemistry data; forest decline; humic substances; aquatic acidification.

EDWARD C. KRUG, ALLEN S. LEFOHN, DUDLEY J. RAYNAL, WAYNE L. BANWART, JAMES R. KRAMER, RICHARD SEMONIN

**18-3. The Role of Science in Acid Rain Policy** (Wed., p.m.). Federal program; perspective; concerns of industry; Canadian perspective; science in congressional debate.

J. CHRISTOPHER BERNABO, DWAIN WINTERS, RENÉ H. MALÈS, HANS C. MARTIN, MICHAEL OPPENHEIMER, ROBERT M. FRIEDMAN

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## Popular Science

**19-1. Plants for People: Science, Art, and Politics in Cities** (Sat., p.m.). Human behavior; urban trees; environmental stress; scientific support; civilizing the city.

H. B. TUKEY, JR., CHARLES LEWIS, JAMES R. CLARK, NINA BASSUK, ROY L. TAYLOR, GRANT R. JONES

**19-2. Chemistry Is Fun!** (Sun., a.m.). Magic of chemistry; home-made ice cream; fourth graders; demonstrations.

HELEN M. FREE, RONALD LAESSIG, MARK A. BAMBENEK, DONALD L. GIBBON, KEITH KENNEDY, NATHAN READING, MARSDEN QUEIROZ, ALFRED FREE, BASSAMN SHAKHASHIRI

**19-3. Science for the Naked Eye; or, The Physics of Everyday Experience, XIV** (Mon., a.m./p.m.). Haitian zombi; looking at Earth; perception of form; iridescence in nature; real Mona Lisa; Shroud of Turin.

ROLF M. SINCLAIR, WADE DAVIS, PRISCILLA STRAIN, JOHN DAVID MOONEY, ROBERT GREENLER, JOHN ASMUS, ERIC JUMPER

**19-4. Night Baseball at Wrigley Field: Technological Innovation and Sports** (Wed., a.m.). Lights controversy; political context; ballplayer's perspective; effects on the Cubs; technological innovation and urban community.

ALBERT H. TEICH, RON RAPOPORT, JEROME M. ORBACH, RANDY HUNDLEY, BILL JAMES, CHRISTOPHER ROSS

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# II. Life Sciences and Technology

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## Frontiers of Neuroscience

**20-1. Frontiers of Neuroscience** (Sun., a.m./p.m.; Mon., a.m./p.m.; Tue., a.m./p.m.). **Requires special registration.** Neurogenetics; molecular specificity; molecular biology; myelination; ion channels; ACh receptors; channel structure; muscle kinetics; second messengers; phosphorylation; neuronal excitability; synaptic function; dopamine and DARP-32; axonal transport; cytoskeletal translocation; neural systems; visual cortex; optical imaging; neocortical development.

DANIEL L. ALKON, FLOYD E. BLOOM, JOSEPH B. MARTIN, RICHARD QUARLES, WILLIAM AGNEW, JEAN-PIERRE CHANGEUX, JON LINDSTROM, KARL L. MAGLEBY, FRANCISCO BEZANILLA, RICHARD W. TSIEN, KING-WAI YAU, ROBERT J. DE LORENZO, LEONARD KACZMAREK, RODOLFO R. LLINAS, IVAR S. WALLAAS, JOHN W. GRIFFIN, RAYMOND J. LASEK, THOMAS S. REESE, EMILIO BIZZI, CHARLES D. GILBERT, AMIRAM GRINVALD, PASKO RAKIC

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## Ecology

**21-1. Deep-Sea Hydrothermal Vents and Cold-Water Seeps: Recent Advances** (Sun., a.m./p.m.). Introduction; temporal change; methanotrophic symbiosis; symbionts and host; sulfide

metabolism; *Vestimentifera*; time-lapse views; *Calyptogena magnifica*; Mid-Atlantic Ridge; microorganisms; Florida Escarpment; Gulf of Mexico; deep-seep mussels; recent advances.

RICHARD A. LUTZ, DAVID M. KARL, RUTH D. TURNER, ROBERT R. HESSLER, JAMES J. CHILDRESS, DAN DISTEL, GEORGE N. SOMERO, MEREDITH L. JONES, VERENA TUNNICLIFFE, J. FREDERICK GRASSLE, CHRISTOPHER D. WINN, BARBARA HECKER, CHARLES K. PAULL, JAMES M. BROOKS, COLLEEN M. CAVANAUGH, DANIEL DESBRUYERES

**21-2. Biomass and Geography of Large Marine Ecosystems** (Mon., p.m.; Tue., a.m./p.m.). Resource yields; Huanghai Sea; East Greenland Sea; Kuroshio Current; Oyashio Current; Gulf of Mexico; measuring variability; Tasman Sea; Iberian ecosystem; Gulf of Thailand; biomass flips; Great Barrier Reef; geographic perspectives; global management; remote sensing; Pacific Ocean; Atlantic Ocean; management regime.

KENNETH SHERMAN, LEWIS M. ALEXANDER, QISHENG TANG, K. VAGN HANSEN, MAKOTO TERAZAKI, TAKASHI MINODA, M. MCGOWAN, WILLIAM RICHARDS, GRAHAM HARRIS, TIM WYATT, TWESUKDI PIYAKARNCHANA, ROGER BRADBURY, PHIL ZION, JOSEPH MORGAN, VICTOR PRESCOTT, MARTIN BELSKY

**21-3. Biological Invasions and the Assembly of Ecological Communities: An Aquatic and Terrestrial Perspective** (Wed.,

a.m./p.m.). *Drosophila*; sessile communities; theoretical approaches; disturbed ecosystems; extinction versus invasion; plate tectonic events; introduced species; tropical intertidal community; community assembly.

JAMES A. DRAKE, MICHAEL E. GILPIN, MARCEL REJMANEK, GEORGE SUGIHARA, JAMES MACMAHON, JOHN J. MAGNUSON, JONATHAN ROUGHGARDEN, STUART L. PIMM, JOHN P. SUTHERLAND

## Ecology—Great Lakes

**22-1. The International Symposium on Stock Assessment and Yield Prediction** (Sun., p.m.). Freshwater fish production; theory of models; fisheries of the Great Lakes; multi-species fisheries; community ecology.

W. (JACK) CHRISTIE, GEORGE R. SPANGLER, JOE H. LEACH, JOSEPH F. KOONCE, STUART L. PIMM, DAVID O. EVANS

**22-2. Contaminant Issues in the Great Lakes** (Mon., a.m./p.m.). Non-toxic trends; atmospheric inputs; long-term fate; organic toxicants; comparison with marine areas; lake trout; fish neoplasia; dioxin bioaccumulation; human exposure; health risks.

BRIAN J. EADIE, DONALD SCAVIA, STEVEN J. EISENREICH, JOHN A. ROBBINS, PETER F. LANDRUM, ANDREW ROBERTSON, WAYNE WILFORD, JOHN BLACK, RICHARD PETERSON, HAROLD HUMPHREY, WILLIAM SONZOGNI

**22-3. Physical Problems in the Great Lakes** (Tue., a.m.). Iso-static rebound; water levels; coastal processes; circulation and temperatures; ice cover.

FRANK H. QUINN, CURTIS E. LARSEN, GUY MEADOWS, FARRELL BOYCE, RAYMOND A. ASSEL

**22-4. Great Lakes Management: Socio-economic and Institutional Considerations** (Tue., p.m.). Institutional ecosystem; industry profile; region's economy; fishery management; binational governance; basin-wide management.

MICHAEL J. DONAHUE, DAVID R. ALLARDICE, JOHN L. HAZARD, CARLOS M. FETTEROLF, JR., HENRY A. REGIER, LYNTON K. CALDWELL

## Molecular Biology

**23-1. Recent Advances in Human Leukemias and Lymphomas** (Sun., a.m.). Role of oncogenes; acute nonlymphocytic leukemia; granulocyte-macrophage colony; T-cell leukemia viruses.

ROBERT PETER GALE, JANET D. ROWLEY, JUDITH A. GASSON, IRVINE S. Y. CHEN

**23-2. Chromosome Abnormalities in Human Cancer: Biological and Diagnostic Implications** (Mon., a.m.). Molecular genetics; fusion protein; acute myeloid leukemia; lymphoid neoplasia; leukemia and lymphoma.

JANET D. ROWLEY, WEBSTER K. CAVENEE, JOHN H. GROFFEN, MICHELLE M. LEBEAU, JEFFREY L. SKLAR, CLARA D. BLOOMFIELD

**23-3. Deciphering the Human Genome** (Mon., p.m.). Maps of chromosomes; sequencing; computational aspects; Department of Energy initiative.

BEVERLY J. BERGER, FRANK H. RUDDLE, CHARLES R. CANTOR, WALTER GILBERT, WALTER GOAD, DAVID PADWA, CHARLES P. DELISI, MARK W. BITENSKY

**23-4. Chemical Solutions to Problems in Biochemistry** (Tue., a.m.). Monoclonal antibodies; affinity chromatography; herbicide use; new supermolecular forms; DNA sequencing.

LINDA SWOFFORD, JAMES R. Y. RAWSON, STEVEN T. ROSEN, IRWIN CHAIKEN, LAURENS METS, ARTHUR VEIS, ROBERT HASELKORN

## Biomedical Technology

**24-1. Assessing Corporate-Academic Ties in Biotechnology** (Sun., p.m.). Theory and practice; public's interests; impact on universities; the scientist's role.

VIVIAN WEIL, PAUL DEFORD, CLIFFORD GROBSTEIN, MARC LAPPÉ, EDWARD L. MACCORDY, JEFFREY PRICE

**24-2. Communication for Persons Who Cannot Speak: An Integration of Science and Technology** (Mon., a.m.). Access to communication; synthesized speech; augmentative system use.

JON F. MILLER, GREGG VANDERHEIDEN, RICK FOULDS, DAVID R. BEUKELMAN

**24-3. Medical Imaging** (Tue., a.m./p.m.). Visual models; image perception to interpretation; enhancing understanding; needs in radiology; effective presentation; real intelligent imaging; state of the art; nuclear magnetic resonance; restoration images; cranio-facial abnormalities; cephalic group; statistics of shape.

WILLIAM R. HENDEE, COLIN R. GOODALL, ARTHUR P. GINSBURG, CALVIN F. NODINE, STEVEN E. SELTZER, GEORGE W. SEELEY, STEPHEN M. PIZER, ROBERT S. LEDLEY, MICHAEL M. TER-POGOSSIAN, STUART A. GEMAN, DONALD E. MCCLURE, JOHN C. KOLAR, MELVIN L. MOSS, FRED L. BOOKSTEIN, RICHARD SKALAK

**24-4. Biotechnology and the Social Transformation of Scientific Practice** (Wed., p.m.). Monopoly capital; university-industrial complex; crystallography; protein engineering.

JACK R. KLOPPENBURG, JR., LESLIE OAKES, DANIEL LEE KLEINMAN, MARTIN KENNEY, DAVID BLUMENTHAL, ROGER BEACHY, DANIEL J. GOLDSTEIN

## Medical Sciences

**25-1. Viral Infections of the Mouth: From Herpes to AIDS** (Sat., p.m.). Herpes simplex infections; papillomaviruses; Epstein-Barr virus; AIDS retrovirus.

HARALD LÖE, JOHN S. GREENSPAN, JAMES F. ROONEY, PETER M. HOWLEY, PAOLO CASALI, ARNOLD B. RABSON, ABNER LOUIS NOTKINS

**25-2. Protein Drugs: A Revolution in Therapy?** (Sun., p.m.). Therapeutic potential; growth regulatory factors; plasminogen activators; monoclonal antibodies; immunomodulators.

WOLFGANG SADÉE, HAROLD L. MOSES, ELLIOT B. GROSSBARD, FRANCES M. BRODSKY, NICHOLAS P. PLOTNIKOFF

**AAAS presents a unique opportunity to hear from renowned leaders on the cutting edge of neuroscience research. See page 1439.**

**25-3. New Problems Associated with Noise Pollution** (Mon., p.m.). Public policy; noise damage; cochlear pathology; hearing loss; acoustic trauma; industrial environments.

THOMAS J. TIGHE, DONALD HENDERSON, ALICE H. SUTER, HENNING E. VON GIERKE, EDWIN W. RUBEL, CHARLES LIBERMAN, R. A. SCHMEIDT, J. C. ADAMS, L. KULISH, JOHN H. MILLS, GEORGE M. GERKEN, RICHARD J. SALVI, ROGER P. HAMERNIK

**25-4. Technology of Immunoassays** (Tue., a.m.). Computer-controlled automation; ELISA; luminescence; fluoroimmunoassay; enzyme immunoassays.

GEORGES M. HALPERN, RUSSELL K. HOSTETTER, GERALD J. KOST, TOD R. FAIRBANKS, LAWRENCE J. KRICKA, DEAN S. MILBRATH, ERKKI J. SOINI, ROBERT H. YOLKEN

**25-5. Clinical Applications of Neural Transplantation** (Wed., a.m.). Hippocampal denervation; neuroendocrine transplants; peripheral nervous grafts; GnRh-neurons.

ROGER M. MORRELL, FRED H. GAGE, VICTORIA N. LUINE, ALBERT J. AGUAYO

**25-6. A National Strategy for AIDS** (Wed., p.m.).

JUNE E. OSBORN, JAMES CHIN, PAUL VOLBERDING, LEON EISENBERG, HARVEY FINEBERG

## Biomedical Ethics

**26-1. Prospects and Problems of Human Gene Therapy** (Sun., p.m.). Scientific considerations; public health implications; individual responsibility; ethical dimensions; legal questions.

RUTH HUBBARD, NACHAMA WILKER, W. FRENCH ANDERSON, LAURIE NSIAH-JEFFERSON, ROBERT CRAWFORD, MARC LAPPÉ, JANET GALLAGHER

**26-2. Responsible Uses of Microorganisms and Microbiological Products** (Tue., p.m.). Military research; international use; uses in vaccines; pest control; environmental consequences.

JEANNE S. POINDEXTER, ROY CURTISS, III, LIDIA S. WATRUD, RAMON J. SEIDLER

**26-3. Ethics and Medical Technology: Decision Making for Critically Ill Patients** (Wed., a.m.). Critically ill children; older persons; decision making; moral and technical judgments; ethical perspectives.

ARTHUR S. ELSTEIN, ARTHUR F. KOHRMAN, JOSEPH J. COTTRELL, DAVID T. STEIN, CHRISTINE K. CASSELL, KENNETH L. VAUX

## Health Policy

**27-1. Risk of Teratologic and Other Adverse Developmental Effects: Assessment and Policy** (Sun., a.m.). Trend in dose; developmental toxicity; cluster sample analysis; species gap; values of risk.

DOROTHY G. WELLINGTON, JOHN R. VAN RYZIN, ELAINE FAUSTMAN-WATTS, WILLIAM J. BUTLER, REBECCA T. ZAGRANISKI, ALLEN L. JENNINGS

**27-2. Technology Assessment in the Health Care Environment** (Mon., a.m.). Methodological advances; cost-effective analysis; public policy making; national perspective.

WILLIAM T. MCGIVNEY, DAVID M. EDDY, BRYAN R. LUCE, JOHN C. NELSON, HERBERT L. ABRAMS, WILLIAM R. HENDEE

**27-3. Health Policy Agenda for the American People: Framework for Decision Making** (Mon., p.m.). Availability of funding; academic medical centers; university-industry ventures; responsibilities for the proper conduct of science.

CHARLES R. MACKAY, R. MARK EVANS, M. ROY SCHWARZ, JAMES B. WYNGAARDEN, THOMAS J. KENNEDY, JR., EDWARD N. BRANDT, JR., SAMUEL O. THIER, RICHARD T. F. SCHMIDT

**27-4. A New Look at Black and Hispanic Health Care Issues** (Tue., p.m.). Affirmative action; status of minorities; medical school applicant pool; Secretary's Task Force; financing of health care.

YOLANDA S. GEORGE, SHIRLEY M. MALCOM, STEPHEN N. KEITH, JOAN C. BARATZ, HERBERT NICKENS, ERIC MUNOZ, VIVIAN PINN-WIGGINS

**27-5. Demographic, Epidemiological, and Medical Perspectives on Cause of Death** (Wed., a.m.). International perspective; multiple cause mortality trends; cancer mortality.

CHARLES B. NAM, KENNETH G. MANTON, ROBERT A. ISRAEL, ALAN D. LOPEZ, ERIC STALLARD, H. DENNIS TOLLEY, WILSON R. RIGGAN, MAX A. WOODBURY, JOHN P. CREASON

## Agricultural Research

**28-1. Agricultural Applications of Plant Biotechnology** (Sat., p.m.). Tomato chromosomal sequences; plant engineering; host-parasite interactions; genomic reorganization.

L. CURTIS HANNAH, STEVEN D. TANKSLEY, STEVEN G. ROGERS, DEAN W. GABRIEL, RONALD L. PHILLIPS

**28-2. Rhizosphere Dynamics** (Sun., a.m./p.m.). Tools; root and faunal activity; research aboard the Space Shuttle; bioregulation; root water flux; soil-borne pathogens; mycorrhizal roots of conifers; modeling root dynamics.

JAMES E. BOX, LUTHER C. HAMMOND, DENNIS PARKINSON, HOWARD M. TAYLOR, DAN R. UPCHURCH, RICHARD J. SNIDER, ALVIN J. M. SMUCKER, RANDY MOORE, MICHAEL J. KASPERBAUER, GERRIT HOOGENBOOM, MORRIS G. HUCK, R. JAMES COOK, C. P. PATRICK REID, J. V. ROUSSEAU, DAVID M. SYLVIA, FRANK D. WHISLER, DONALD N. BAKER

**28-3. Antibiotic and Pesticide Resistance: An End to the Era of Chemical Control?** (Wed., a.m.). Microbial resistance; potential for new chemicals; resistance management; arthropod pests.

RICHARD T. ROUSH, BRUCE R. LEVIN, STUART B. LEVY, ROBERT L. METCALF, JOHN A. BARRETT, BRIAN A. CROFT

## Agricultural Policy

**29-1. The Food Security Act of 1985; Implications for Agriculture, the Economy, and Research** (Mon., p.m.). The farming sector; consumers; agricultural credit; agribusiness community; research.

ROBERT G. F. SPITZE, R. JAMES HILDRETH, STANLEY R. JOHNSON, JOYCE E. ALLEN, BRUCE J. BULLOCK, JOE O. ARATA

**29-2. Public Perceptions of Farming and the Future of Food Production** (Tue., a.m.). Agrarianism in American society; public preferences; social determinants; minority perspectives; national perspective.

JOSEPH J. MOLNAR, GREGORY D. HANSON, C. MILTON COUGHENOUR, PETER F. KORSCHING, CRAIG K. HARRIS, REX R. CAMPBELL, GEORGE C. KRIZ

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## III. Social and Behavioral Sciences

### Frontiers of Social Science

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**30-1. Frontiers of Social Science: Single Parenthood, Biosocial Dimensions** (Mon., a.m.). Parental investment strategies; effects of mortality; demographic perspectives; Afro-American families.

LONNIE R. SHERROD, BEATRIX A. HAMBURG, JANE B. LANCASTER, MARIS A. VINOVSIS, LAWRENCE BASEM, DENNIS P. HOGAN, HARRIETTE PIPES McADOO

### Archaeology

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**31-1. The Emergence of Normal Science in Archaeology** (Wed., a.m.). Animal bones as clues to early human behavior; data analysis; contract excavations; collections management; integrating fieldwork-analysis-theory.

WILLIAM O. AUTRY, LESLIE G. FREEMAN, RICHARD G. KLEIN, GEORGE R. MILNER, LARRY R. KIMBALL, JAMES A. BROWN

**31-2. Accelerator Radiocarbon Dating and the Reassessment of American Prehistory** (Wed., p.m.). Reassessing New Mexican dates; making cultigens count; dating in the eastern United States; dating early maize; ceramic chronology in Michigan.

RICHARD I. FORD, JERRY J. STIPP, WILLY WOLFLI, MURRAY A. TAMERS, WIRT H. WILLS, FRANCIS E. SMILEY, GAYLE FRITZE, BRUCE D. SMITH, WILLIAM A. LOVIS

### Anthropology

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**32-1. Evolutionary Issues on the Interface of Genes and Cultures** (Sun., a.m.). Human capacity for belief; moral norms; psychological mechanisms; religious and social attitudes.

PHILIP HEFNER, WARD H. GOODENOUGH, KARL PETERS, DONALD T. CAMPBELL, MIHALY CSIKSZENTMIHALYI, LINDON J. EAVES, SOLOMON H. KATZ



Stanley Field Hall in the Field Museum of Natural History. (Chicago Convention and Tourism Bureau, Inc.)

**32-2. War and Peace: New Anthropological Perspectives** (Sun., p.m.). Contemporary Peru; costs of war; witchcraft; combining deterrence with confidence building.

CAROL J. GREENHOUSE, BILLIE JEAN ISBELL, CAROL MORTLAND, PAUL R. TURNER, J. KENNETH SMAIL, ROBERT A. RUBINSTEIN

**32-3. Tools and Toys: Human Implementation in Evolutionary and Cross-Cultural Perspective** (Mon., a.m.). Humans and chimpanzees; haptic communication; Piaget's formal operations; hand-held Earth models; engineering history; scale models.

MYRDENE ANDERSON, JAMES W. FERNANDEZ, TOM GLENN, FLOYD M. MERRELL, DAVID RINDOS, PETER C. REYNOLDS, AVERY R. JOHNSON, SHEA ZELLWEGER, BETHE HAGENS, VERNARD FOLEY

**32-4. Primate Behavior: Memorial Tribute to Dian Fossey** (Mon., p.m.). Mountain gorillas; lowland gorillas; ape social ecology; long-term studies; small populations; ape behavior and human evolution.

RICHARD W. WRANGHAM, DAVID WATTS, CAROLINE E. G. TUTIN, JEANNE ALTMANN, KAREN B. STRIER, RANDALL L. SUSMAN

### Gender Studies

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**33-1. Gender, Health, and Longevity: Multidisciplinary Perspectives** (Sun., p.m.). Historical perspectives; careers and family roles; sex-dependent biological influences; higher morbidity for men; multiple roles for mid-aged women.

MATILDA WHITE RILEY, MARCIA G. ORY, W. ANDREW ACHENBAUM, JUDITH LORBER, DAVID W. E. SMITH, HUBER R. WARNER, LOIS M. VERBRUGGE, SONJA M. MCKINLAY

**33-2. The Participation of Women in Science Since Antiquity** (Mon., a.m.). Hypatias heritage; antiquity and the Middle Ages; Jewish women; Russian women; Black women.

CAROLINE L. HERZENBERG, MARGARET K. BUTLER, MARGARET M. ALIC, SUSAN V. MESCHEL, ANN HIBNER KOBLITZ, PATRICIA CLARK KENSCHAFT, BETTY WINDHAM

**33-3. Women in Agricultural Production: Comparative and Historical Perspectives** (Mon., p.m.). Public policy; division of labor; organizing peasant women; technological change; rural women speak out.

WAVA G. HANEY, FRED T. SAI, CORNELIA BUTLER FLORA, CAROLYN E. SACHS, FLORENCE A. SAI, JANET L. BOKEMEIER, LORRAINE GARKOVICH, JANE B. KNOWLES

**33-4. Bias in Sex Differences Research** (Tue., a.m.). Sex differences in laterality; spatial abilities; neurosciences; menstrual cycle research; sex equality.

BETTY M. WINDHAM, CAROLINE L. HERZENBERG, MARCEL KINSBOURNE, PAULA J. CAPLAN, RUTH BLEIER, ANNE FAUSTO-STERLING, ALLISON M. JAGGAR, BETTO JO T. DOBBS

### Economics

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**34-1. Technology and Economic Change** (Sat., p.m.). Science



and technology; Soviet technological progress; new manufacturing strategies; impact of automation; implications for the economy.

FAYE DUCHIN, NATHAN ROSENBERG, DAVID MOWERY,  
HOLLAND HUNTER, SUSAN SANDERSON, RICHARD M. CYERT,  
WASSILY LEONTIEF

**34-2. The United States as the Largest Debtor Nation and Japan as the Largest Creditor** (Sun., p.m.). Dependence on foreign capital; automotive production; Japanese investments in the United States; Japanese steel industry; investment flows.

LESLIE S. HIRAOKA, KEIICHIRO HAYASHI, CRAIG S. HAKKIO,  
MICHAEL S. FLYNN, TATSUO NISHII, LEONARD H. LYNN

## Sociology & Political Science

**35-1. Dismantling the Welfare State: The Role of the Not-for-Profit Sector** (Sun., a.m.). Philanthropy and social welfare; advanced industrial states; personal social services; reductions in federal support; community response.

JOSEPH J. GALASKIEWICZ, STANLEY N. KATZ, ESTELLE JAMES,  
YEHESEKEL HASENFELD, KIRSTEN A. GRØNBJERG

**35-2. The Research Basis for Science Policy Making** (Mon., a.m.). Research facilities; federal funding shifts; peer review study; supply and demand.

DARYL E. CHUBIN, EDWARD WOODHOUSE, CHRIS CASWILL,  
SUSAN E. COZZENS, P. THOMAS CARROLL, EDWARD  
HACKETT, HOWARD GOBSTEIN, LISA C. HEINZ

**35-3. New Technology in Criminal Justice** (Mon., p.m.). Alcohol interlocks; detecting psychotropic drugs; biological evidence; remote sensors for home incarceration; electronic monitoring.

DONALD W. COLLIER, MERRILLE ALCARO, CLIFFORD  
BROEDER, GEORGE SENSABAUGH, DAVID J. HUNTER,  
CHARLES M. FRIEL, ROLONDO V. DEL CARMEN, JOSEPH B.  
VAUGHN

**35-4. Whatever Happened to the Melting Pot?** (Tue., a.m.). Measurement of ethnic origin; ethnosurveys; patterns of immigration; ethnicity in Texas; labor market experience.

CONSTANCE F. CITRO, DANIEL B. LEVINE, JEFFREY S. PASSEL,  
DOUGLAS S. MASSEY, EVELYN S. MANN, TERESA A. SULLIVAN,  
ROBERT BACH, PATRICIA C. BECKER

## History & Philosophy

**36-1. Science and Religion: A Revival of Old Tensions** (Sat., p.m.). Social foundations; religious conservatism; attitudes toward science; creationist movement.

JON D. MILLER, WILLIAM C. MCCREADY, ROBERT W.  
SUCHNER, DUANE E. JEFFERY, L. V. GIDDINGS, ROBIN  
LOVIN

**36-2. Science, Humanities, and the Arts: One Culture** (Tue., a.m.). (C.P.) Snow melted; ethical issues; scientia et humanitas; aesthetic considerations in science; metaphors; string instruments.

ZAFRA M. LERMAN, DONALD N. LANGENBERG, HENRY A.  
BENT, EUGENE F. MULCAHY, A. TRUMAN SCHWARTZ, JUDITH  
WECHSLER, IRVING M. KLOTZ, MICHAEL KASHA

**36-3. Ethical Norms in Science: Challenges and Opportunities** (Tue., p.m.). Ownership of data; survey of the dissertation process; scientific publication; honor in science.

RACHELLE D. HOLLANDER, JULES B. LAPIDUS, STEPHEN J.

CECI, ALFRED S. SUSSMAN, MARCEL CHOTOWSKI  
LAFOLLETTE, JUDITH SWAZEY, C. IAN JACKSON, TAFT  
BROOME, JOHN SOMMER, MICHAEL SPENCER, PATRICIA  
WOOLF

**36-4. Converging Cultures: Science and the Arts** (Wed., a.m./p.m.). Aesthetic experiencing; aesthetics, psychology, and cognition; computers, history, and historians; renaissance teams; new visual age; artist versus scientist; computer graphics.

FRANK FARLEY, DONNA J. COX, RONALD W. NEPERUD,  
COLIN MARTINDALE, HERBERT W. FRANKE, ORVILLE V.  
BURTON, LARRY L. SMARR, CRAIG D. UPSON, DONALD  
GREENBERG

## Psychology

**37-1. Cognitive Psychology and Survey Research: Recall, Judgment, and Generalization of Results** (Sun., a.m.). Respondents' frequency judgment; questionnaire design; context effects; Bureau of Labor statistics.

JUDITH M. TANUR, STEVEN K. SHEVELL, JUDITH T. LESSLER,  
ROGER TOURANGEAU, JANET L. NORWOOD, GRAHAM  
KALTON

**37-2. Normal and Pathological Aging of Human Memory** (Sun., p.m.). Comprehension of discourse; visual memory; cognitive aspects; neural aspects.

THOMAS J. TIGHE, JAMES C. BARTLETT, FERGUS I. M. CRAIK,  
LYNN HASHER, DANIEL L. SCHACTER, MORTIMER MISHKIN

**37-3. Psychosocial Determinants of Health and Effective Functioning in Middle and Late Life** (Mon., a.m.). Social network ties; anxiety and depression; productive activity; psychosocial factors; widowhood.

JAMES S. HOUSE, TERESA E. SEEMAN, LINDA K. GEORGE, A.  
REGULA HERZOG, CARMIE SCHOOLER, CAMILLE WORTMAN,  
DEBRA UMBERSON

## Education

**38-1. Social Science Research on Urban School Problems** (Sat., p.m.). Cultural context of dropping out; students' performance, identification, and self-perceptions; urban redevelopment; promotional standards; public-private collaboration.

WILLIS E. SIBLEY, DAVID A. BENNETT, MARGARET D.  
LECOMPTE, KATHRYN M. BORMAN, R. TIMOTHY SIEBER,  
NORMAN A. NEWBERG, JEANNETTE S. HARGROVES

**38-2. Educational Technology and Undergraduate Physics Programs** (Sun., p.m.). Personal computers; cognitive principles; computers in the laboratory; interactive videodisks.

JACK M. WILSON, EDWARD F. REDISH, STEVEN E. KOONIN,  
FREDERICK REIF, ELISHA R. HUGGINS, DEAN A. ZOLLMAN

**38-3. Project 2061: What Science, Mathematics, and Technology Is Essential for Everyone** (Mon., a.m.). Mathematics; physical sciences and engineering; life sciences; social and behavioral sciences; technology.

F. JAMES RUTHERFORD, JOSEPH D. NOVAK, DAVID  
BLACKWELL, GEORGE BUGLIARELLO, MARY CLARK,  
MORTIMER APPEL, JAMES R. JOHNSON

**38-4. The Importance of the New Philosophy of Science for School Instruction** (Mon., p.m.). Radical constructivism; vee heuristic; research in mathematics education.



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JOSEPH D. NOVAK, ROBERT B. DAVIS, ARTHUR L. NORBERG,  
ERNST VON GLASERSFELD, D. BOB GOWIN, PAUL COBB

**38-5. Mathematics in the Year 2000: Assessment for Renewal** (Tue., a.m.). Education of teachers; small liberal arts colleges; needs of science and technology.

MARCIA P. SWARD, SHIRLEY A. HILL, LYNN ARTHUR STEEN,  
E. F. INFANTE, BERNARD L. MADISON

**38-6. Improving School Mathematics in the United States: Translating Recent Recommendations into Reality** (Tue., p.m.). Mathematical Sciences Education Board; school algebra; statistics; University of Chicago project.

ZALMAN USISKIN, SHIRLEY A. HILL, JAMES T. FEY, GAIL F. BURRILL, PAUL J. SALLY, JR.

**38-7. Computer Technology, the Economy, Employment, and Education** (Wed., a.m.). Women's employment; requirements of workers; education and training; equity in education; intervention programs; education for girls.

JULIE A. EARLY, SHIRLEY M. MALCOM, MARY MURPHREE,  
LOUISE A. TILLY, ROBERT E. KRAUT, BRYNA SHORE FRASER,  
MARLAINE LOCKHEED, KAY GILLILAND, JANE SCHUBERT

**38-8. Lessons from Early Childhood Education Programs** (Wed., p.m.). Long-term effects; costs and benefits; beginning science equitably; intrinsically interesting phenomena; children's television programs.

YOLANDA S. GEORGE, SHIRLEY M. MALCOM, RICHARD B. DARLINGTON, DAVID WEIKART, BARBARA SPRUNG,

BERNARD ZUBROWSKI, MILTON CHEN

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## Public Understanding

**39-1. The Effect of Nobel Prizes on Science, Scientists, and the U.S. Public** (Sat., p.m.). Indicator of national performance; laureate's perspective; reporter's perspective.

PATRICIA S. CURLIN, JONATHAN WARD, CHRISTOPHER T. HILL, JEROME KARLE, PHILIP M. BOFFEY, HARRIET ZUCKERMAN

**39-2. Research on Learning in Science Centers** (Sun., a.m.). Visitor behavior; building better exhibits; cognitive learning and exploratory behavior; long-term impacts; research agenda.

BONNIE VANDORN, JOHN J. KORAN, JR., MARYLOU KORAN, PATRICIA A. MCNAMARA, CAROLE A. KUBOTA, JUDY DIAMOND, PETER V. STERLING, JOSEPH D. NOVAK, ROGER G. OLSTAD

**39-3. Innovative Science Museum Projects** (Sun., p.m.). New role; new audiences; corporate involvement; profitable and popular; camp-ins.

SHEILA GRINELL, BONNIE VANDORN, GEORGE TRESSEL, DAVID A. UCKO, EUGENE L. FAIRFIELD, DENNIS SCHATZ, ROY L. SHAFER, DONALD N. LANGENBERG

**39-4. Current Controversies in Science and Technology: Late-Breaking News** (Tue., a.m.).

GEORGE W. TRESSEL, ALBERT H. TEICH, PATRICIA S. CURLIN

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# IV. International Science and Policy

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## International Science

**41-1. Science in Japan** (Mon., a.m.). Overview; engineering creativity; biotechnology; research collaboration; internationalization; careers.

ROBERT S. CUTLER, ROBERT W. LAMSON, CHARLES T. OWENS, HISASHI KOBAYASHI, WILLIAM K. CUMMINGS, RICHARD J. SAMUELS, MARTHA CALDWELL HARRIS, LEONARD LYNN, JUSTIN BLOOM

**41-2. The Internationalization of Social Science: Views from Here and Abroad** (Mon., p.m.). Opportunities in the behavioral and social sciences; U.S. and U.K.-European cooperation; European research; Latin American perspective; less-developed countries.

DAVID JENNESS, NEIL J. SMELSER, ALAN MARSH, LAURENCE RATIER-COUTROT, LARISSA LOMNITZ, LUIS I. RAMALLO

**41-3. Scientific Exchanges, Human Rights, and the Soviet Union** (Tue., a.m.). Historical overview; human rights dimension; private sector and human rights.

KARI E. HANNIBAL, GLENN E. SCHWEIZER, ALLEN H. KASSOF, MORRIS PRIPSTEIN, ALAN CAMPBELL, WALTER REICH

**41-4. New Data on the Soviet Social System: A Survey of Recent Emigrants** (Tue., p.m.). Soviets of retirement age; quality of life; unemployment; intimidation factor; distributive justice.

JAMES R. MILLAR, BARBARA A. ANDERSON, ELIZABETH M. CLAYTON, PAUL R. GREGORY, IRWIN COLLIER, DONNA BAHRY, BRIAN D. SILVER, MICHAEL SWAFFORD

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## Population & Food

**42-1. Population Growth and Human Well-Being** (Sat., p.m.). Population debate; resource/population interactions; government action.

CHARLES V. KIDD, THOMAS S. MERRICK, MICHAEL TEITELBAUM, ALLAN V. KNEESE, PAUL DEMENY, NICK EBERSTADT

**42-2. Global Competition in Agriculture** (Sun., a.m.). Brazil's frontier; European Economic Community; genetic resources; Illinois agriculture.

JAMES W. ROWE, PHILIP H. ABELSON, VERNE W. RUTTAN, DENNIS T. AVERY, ELMAR WAGNER, ROBERT E. EVENSON, JOHN A. PINOT, DONALD A. HOLT

**42-3. Feeding the People of China and India: Comparative Strategies** (Sun., p.m.). Demographic view; food policies; agricultural productivity.

AMY AUERBACHER WILSON, RICHARD E. BARRETT, SUSANNE HOEBER RUDOLPH, D. GALE JOHNSON, SUSAN GREENHALGH, BRUCE STONE, LUNG-FAI WONG

**42-4. Agroforestry in the World Today** (Mon., a.m.). Land and tree tenure; property rights; combined forage and tree cultivation; combined corn and fuelwood production.

DAVID PIMENTEL, PETER ORAM, LOUISE FORTMANN, DAVID H. FEENY, JEFFREY GRITZNER

**42-5. Genetic Diversity and Food Security: A Global Perspective** (Mon., p.m.). First World-Third World cross-pressures; agrocodevelopment; traditional agroecosystems and conservation; gene banks; plant breeding.

KENNETH A. DAHLBERG, LAWRENCE BUSCH, GEORGE E. BROWN, JR., WES JACKSON, RAYMOND DASMANN, STEPHEN B. BRUSH, DONALD PLUCKNETT, WILLIAM LACY

## **Communications & Security**

**43-1. Open Communication of Government-Sponsored Research: A Five-Nation Survey** (Tue., p.m.). U.S. policies; Great Britain; France; Japan; Germany.

MITCHEL B. WALLERSTEIN, STEPHEN B. GOULD, CHARLES H. HERZ, ANTHONY R. COX, JEAN-CLAUDE DERIAN, KANAME IKEDA, HEINZ G. SEIPEL

**43-2. National Security Classification and the Individual Researcher** (Wed., a.m.). Individual rights; scientist's experience; overview.

EDWARD TANZMAN, ALLAN ADLER, CHARLES ARCHAMBEAU, STEVEN GARFINKEL, WILLIAM J. SUMMA

**43-3. Should We Rely upon Polygraphs to Protect National Security?** (Wed., p.m.). Trends in use; limits on reliability; experiences at the National Security Agency; necessity of polygraphs.

WILLIAM A. THOMAS, DENISE DOUGHERTY, LEONARD SAXE, DANIEL C. SCHWARTZ, HAROLD P. GREEN

## **Arms Control & Security**

**44-1. Nuclear Test Bans: Key Technical Issues and Prospects for Action** (Sat., p.m.). Seismic monitoring; SDI and nuclear testing; computer simulation; stockpile reliability.

KENNETH N. LUONGO, LYNN R. SYKES, GEORGE H. MILLER, RICHARD L. WAGNER

**44-2. Offensive Use of SDI and Inadvertent Escalation: Strategic Implications** (Sun., a.m.). Technical feasibility; earth strike; command and control; maritime strategy.

DONALD M. ROTE, BARRY O'NEILL, HARVEY L. LYNCH, CAROLINE L. HERZENBERG, PETER ZIMMERMAN, BRUCE BLAIR, JOHN MEARSHEIMER

**44-3. The Goal of Strategic Defenses, and the Transition** (Sun., p.m.). SDI; transition to assured survival; survivability measures; hard point defenses; arms control; role of ATBM.

W. THOMAS WANDER, SIDNEY N. GRAYBEAL, GLENN KENT, JAMES R. SCHLESINGER, LEON SLOSS, DONALD HAFNER

**44-4. Alternative Approaches to Arms Control** (Mon., a.m.). Problems and prospects; domestic context; current issues; case for arms control; what went wrong.

MICHAEL D. INTRILIGATOR, ROMAN KOLKOWICZ, HERBERT YORK, PAUL WARNKE, THOMAS SCHELLING

**44-5. STARTs, Stops, and Talks: The Geneva Negotiations** (Mon., p.m.). Prospects for agreement.

W. THOMAS WANDER, RODNEY W. NICHOLS, EDWARD L. ROWNY

**44-6. Enhancing Conflict-Coping Skills: Social Science and the U.S. Institute of Peace** (Tue., a.m.). Need for improved skills; contributions of psychology; anthropology; Peace Institute.

MARY LECRON FOSTER, ROGER FISHER, RUTH ADAMS, JOHN E. MACK, JAMES E. GOODBY, ALLEN WEINSTEIN

**44-7. Biotechnology and Biological Warfare** (Tue., p.m.). Medical defense; public perception; chemical warfare; environmental risks.

DAPHNE KAMELY, NORTON D. ZINDER, DAVID L. HUXSOLL, PHILIP J. HILTS, AMORETTA HOEBER

**44-8. NATO: Sand or Oil in the Gears of Arms Control?** (Wed., a.m.).

JANE M.O. SHARP, JONATHAN DEAN, JOHN ROPER, BARRY O'NEIL, GLENN SNYDER, ELISA HARRIS, KENNETH ADELMAN

**44-9. Arms Control Treaty Verification: New Technological Initiatives** (Wed., p.m.). Congressional priorities; DOE requirements; technology developments; future of arms control.

ALEXANDER DEVOLPI, JOHATHAN STEIN, WILLIAM N. HENOCK, MILO NORDYKE, SIDNEY N. GRAYBEAL, JOHN R. BALL

## **Contributed Papers**

Contributed papers will be presented in poster session format in the Wacker Exhibition Hall, Hyatt Regency. Abstracts for the individual papers will be found in *Abstracts of Papers*, available on-site to all registrants. Sessions are scheduled as follows:

1. **History & Philosophy of Science;**  
**Physical Sciences** (Sun. 15, 11:30 a.m.-1:00 p.m.)
2. **Biological Sciences** (Sun. 15, 1:15 p.m.-2:45 p.m.)

3. **Neuroscience** (Sun. 15, 9:00 p.m.-10:30 p.m.)
4. **Medical Science & Health Care** (Mon. 16, 11:30 a.m.-1:00 p.m.)
5. **American Junior Academy of Science:**  
Research papers by high school students  
(Mon. 16, 1:15 p.m.-2:45 p.m.)
6. **Social & Behavioral Sciences** (Tue. 17, 11:30 a.m.-1:00 p.m.)

Announcing a unique opportunity to hear from renowned leaders on the cutting edge of neuroscience research:

# Frontiers of Neuroscience

## A Special Three-Day Seminar at the AAAS Annual Meeting

### Seminar Program

#### Sunday 15 February

##### 9:00AM — Neurogenetics:

FLOYD E. BLOOM (Division of Preclinical Neurology and Endocrinology, Scripps Clinic and Research Foundation) — *Molecular Specificity in the Nervous System*

JOSEPH B. MARTIN (Chief, Neurological Services, Massachusetts General Hospital) — *Molecular Biology of Neurology*

RICHARD QUARLES (Head, Section on Myelin and Brain Development, NINCDS, NIH) — *Myelination, Membrane Glycoproteins and Cell-Cell Interactions*

##### 1:15PM — Keynote Lecture:

SOLOMON H. SNYDER (Director, Dept. of Neuroscience, Johns Hopkins University School of Medicine) — *Multiple Receptors for Multiple Messengers*

##### 2:30PM — Ion Channels:

WILLIAM AGNEW (Dept. of Physiology, Yale University School of Medicine) — *Structure of Reconstituted Na<sup>+</sup> Channels*

JEAN-PIERRE CHANGEUX (Molecular Neurobiology, Pasteur Institute) — *Long-Term Modification of ACh Receptors*

JON LINDSTROM (Salk Institute) — *Molecular Biological Approaches to Channel Structure*

KARL L. MAGLEBY (Dept. of Physiology and Biophysics, University of Miami School of Medicine) — *Kinetics of Ion Channels in Muscle*

##### 6:30PM — Cocktail Reception (cash bar)

##### 9:00PM — Poster Session:

All seminar registrants are invited to submit abstracts for poster sessions. (Deadline is 2 January. See 12 September 1986 *Science* for format.)

#### Monday 16 February

##### 9:00AM — Ion Channels:

FRANCISCO BEZANILLA (Dept. of Physiology, UCLA Center for Health Sciences) — *Na<sup>+</sup> Channel Function*

RICHARD W. TSIEN (Dept. of Physiology, Yale University School of Medicine) — *Regulation of Ca<sup>++</sup> and Ca<sup>++</sup> - K<sup>+</sup> Channels*

KING-WAI YAU (Howard Hughes Medical Institute, Johns Hopkins University) — *Cyclic-Nucleotide-Activated Channels in Phototransduction*

##### 1:15PM — Plenary Lecture:

DANIEL L. ALKON (Head, Section on Neural Systems, NIH, NINCDS at Marine Biological Laboratory) — *Biophysical and Molecular Records of Associative Memory*

##### 2:30PM — Second Messengers:

ROBERT J. DELORENZO (Professor and Chairman, Dept. of Neurology, Medical College of Virginia) — *Calcium/Calmodulin-Regulated Phosphorylation*

LEONARD KACZMAREK (Dept. of Pharmacology, Yale University School of Medicine) — *Biochemistry of Neuronal Excitability*

RODOLFO R. LLINAS (Dept. of Physiology and Biophysics, New York University Medical Center) — *Molecular Regulation of Synaptic Function*

IVAR S. WALLAAS (Laboratory of Molecular and Cellular Neuroscience, Rockefeller University) — *Kinases, Phosphatases, Dopamine, and DARP-32*

##### 10:00PM — Poster Session:

All seminar registrants are invited to submit abstracts for poster sessions. (Deadline is 2 January. See 12 September 1986 *Science* for format.)

#### Tuesday 17 February

##### 9:00AM — Axonal Transport:

JOHN W. GRIFFIN (Dept. of Neurology, Johns Hopkins University School of Medicine) — *Axonal Transport and Myelin-Forming Cells*

RAYMOND J. LASEK (Dept. of Anatomy, Case Western Reserve University) — *Translocation of Cytoskeletal Elements*

THOMAS S. REESE (Laboratory of Neurobiology, NIH, NINCDS at Marine Biological Laboratory) — *Molecular Basis of Fast Axonal Transport*

##### 2:30PM — Neural Systems:

EMILIO BIZZI (Whittaker College, MIT) — *Neural Systems and Movement*

CHARLES D. GILBERT (Rockefeller University) — *Circuitry and Function of the Visual Cortex*

AMIRAM GRINVALD (Laboratory of Neurobiology, Rockefeller University) — *Optical Imaging of Activity from Neuronal Arrays*

PASKO RAKIC (Chairman, Section of Neuroanatomy, Yale University School of Medicine) — *Neo-Cortical Development*

**Enrollment Is Limited!**  
**To Guarantee Admission You Must Register in Advance.\***

\*Separate registration and fee required. See registration form at the end of this section.

## Workshops

**W-1. The Nuclear Arms Race: Teaching Technical and Policy Aspects** (Sat., a.m.). Technical approach; multidisciplinary approach; undergraduate curriculum; policy approach; Foundations Fund Nuclear Education Programs.

G. ALLEN GREB, WILLIAM DURCH, MICHAEL T. KLARE, LEONARD RIESOR, ARTHUR SINGER, JR.

**W-2. Hispanics in Science and Engineering: Past, Present, and Future** (Sat., p.m.). Medicine: Puertorican influences; Spain; engineering; interventional programs.

ERIC MUNOZ, WALLACE C. KOEHLER, JR., MARCELO ALONSO, ENRIQUE MENDEZ, JR., JUAN BONNET, ANGEL JORDAN, JOSE MARTINEZ

**W-3. Communicating Science to the Public: Writing Strategies for Scientists and Engineers** (Sun., a.m.). Writing about science for the print mass media; strategies that enhance; reader understanding; packaging information; actual practice under an experienced writer.

SHARON L. DUNWOODY, CAROL L. ROGERS

**W-4. How Computer Technology Affects Social and Economic Issues for the Disabled** (Sun., p.m.). Disabled groups aid; aiding to obtain employment; transportation problems; independent living; rehab services.

HERBERT W. HOFFMAN, THOMAS SHWORLES, CHARLES SCHMIDT, JOHN KOSLOWSKI, KENT JONES, KATH YANNYAN, NARCA BRISTO, JOE HOLZER, SUE SUTER, BONNE FERNEAU, ZENA NAIDITCH

**W-5. Communicating Science to the Public: Strategies for Television, II** (Sun., p.m.).

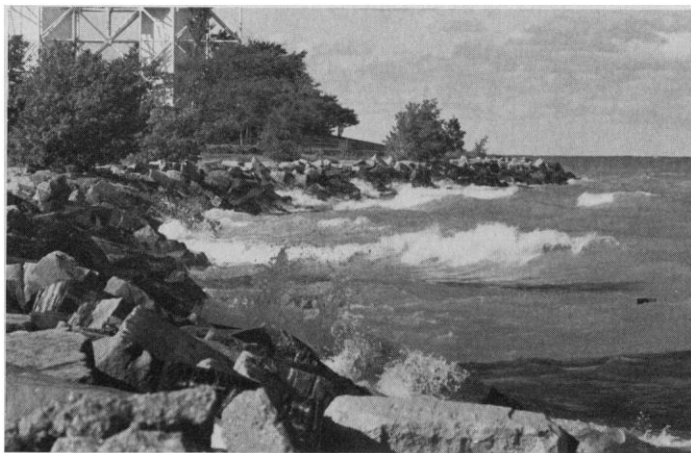
JONATHAN WARD

**W-6. Microcomputers as Decision Aids** (Mon., a.m./p.m.). Decision-aiding software; multiple dimensions; multiple missing information; multiple alternatives; conflicting constraints; need for simplicity; handouts; hands-on experience to participants. [Requires separate registration and additional fee. See page 1445.]

STUART S. NAGEL

**W-7. Workshop on Verification Technologies** (Tue., p.m.).

DEE R. WERNETTE, KENNETH LERNER



Lindheimer Observatory: Evanston campus. (Courtesy of Northwestern University.)

## Science Books & Films presents

# The SB&F Science Film Festival

Regency Ballroom, Hyatt Regency, Chicago

**T**HE SB&F SCIENCE FILM FESTIVAL OFFERS AN IMPORTANT collection of films and videos for all age groups dealing with a range of the natural and social sciences. Come and see programs on physics, astronomy, biomedical sciences, chemistry, anthropology, AIDS, biology, and much more. Expected times are shown below; exact times and a detailed program will be available in the Annual Meeting Program and at the door. Admission is free.

### Sunday, 15 February

- 10:00 a.m. Dwellings
- 10:20 a.m. It's a Frog's Life
- 11:25 a.m. Mud Creek Clinic
- 11:55 a.m. Search for the Disappeared
- 12:55 p.m. Growing Pains
- 1:55 p.m. Nuclear Winter: A Growing Global Concern
- 2:20 p.m. Tornado
- 3:20 p.m. Not Crazy Like You Think

### Monday, 16 February

- 10:00 a.m. Being an Astronaut
- 10:35 a.m. My CAT Scan
- 10:50 a.m. Principles of Technology: Power
- 11:55 a.m. Ladybug, Ladybug
- 12:10 p.m. Weave and Spin
- 12:25 p.m. What Einstein Never Knew
- 1:25 p.m. Mathematics of Choice and Chance: Statistics
- 2:00 p.m. Cheating Death
- 2:35 p.m. Aurora
- 3:40 p.m. Native Land: Nomads of the Dawn

### Tuesday, 17 February

- 10:00 a.m. AIDS: What Everyone Needs to Know
- 10:20 a.m. Welcome Home Jellybean
- 10:55 a.m. All Things Animal
- 11:20 a.m. Cycle
- 11:30 a.m. Solar House
- 11:45 a.m. Copan
- 12:10 p.m. Global Weather
- 12:25 p.m. Weather Systems in Motion
- 12:45 p.m. Immunodeficiency: A Disease of Life
- 1:10 p.m. Holography: Memories in Light
- 1:35 p.m. Ethiopia
- 2:10 p.m. Energy: The Alternatives
- 2:40 p.m. Water, Birth, The Planet Earth: Water and Land

### Wednesday, 18 February

- 10:00 a.m. Acid Rain: In Search of Solutions
- 10:15 a.m. Chemistry Matters
- 10:35 a.m. Hackers
- 11:05 a.m. Growing Up with Rockets
- 12:05 p.m. Another Africa: Wildlife and People in Conflict
- 12:35 p.m. Imprinting
- 1:05 p.m. Cooperation Across Boundaries: The Acid Rain Dilemma
- 1:40 p.m. Realm of the Alligator

# Meeting Information

## Meeting Location

The 1987 Annual Meeting will be held at the **Hyatt Regency Chicago**, 151 East Wacker Drive, where all plenary lectures (midday and evening), symposia, workshops, contributed paper sessions (poster presentations), business meetings, social functions, and other meeting activities are scheduled to take place.

## Hotel Reservations

The AAAS has reserved a block of guestrooms at the Hyatt Regency at reduced convention rates. **These special rates are guaranteed only when reservations are made before 23 January 1987** by using the official AAAS housing form appearing in this and previous *Science* issues. Please complete the form and send it directly to the hotel.

**Do not be a "No Show"!** If you have made a reservation and find that you cannot keep your commitment, please call or write to the hotel and cancel.

## Meeting Registration

**Advance Registration.** Registration categories and fees are shown on the advance registration form in this issue. Registration fees may be charged to your **VISA** or **MasterCard**.

In early January, advance registrants will receive a badge and registration receipt, a preconvention program, and a voucher for the registration packet. Present the voucher at the Advance Registrants' Desk at the Hyatt Regency to receive program and abstracts books, program summary, and other materials. The AAAS registration area will be open as follows:

Saturday through Tuesday,  
14–17 February ..... 8:00 a.m.–6:00 p.m.  
Wednesday, 18 February ..... 8:00 a.m.–12 noon

**Registration Refunds.** The AAAS will refund advance registration fees for all cancellations received by letter or telegram prior to 6 February 1987. **No refunds will be made on cancellations received after that date.** Refunds will be mailed from the AAAS Washington offices after the Annual Meeting.

## Resource Center

**Resources for Disabled Registrants.** The AAAS, in cooperation with the Chicago Advisory Committee, is making every effort to make the Annual Meeting fully accessible to disabled individuals. In addition to accessible meeting rooms and hotel rooms which can accommodate wheelchairs, the following services will be provided through the Resource Center located in the Hyatt Regency: transportation to and from airports, train stations, and bus terminals; interpreters for the hearing-impaired at all plenary lectures and for other sessions on request; special tour and sightseeing information; audiotaped program highlights for the visually impaired; assistance in movement within and outside the hotel; and emergency repair for wheelchairs.

Persons needing special accommodations and services are strongly urged to so indicate on the registration and housing forms. **Your early response will help us serve you better.** For additional information, contact Virginia Stern, AAAS Project on Science, Technology, and Disability, 1333 H Street, NW, Washington, DC 20005 (telephone, 202/326-6667).

**Member Resources.** AAAS members seeking general information about the Association's many activities or who have questions about their membership will find assistance in the Resource Center.

**Resources for Minority Scientists.** Also located in the Resource Center, this area provides an opportunity for the exchange of information and printed materials relevant to the participation of racial and ethnic minorities in the sciences and in the activities of the AAAS. Materials on education, employment, research, and organizations will be displayed.

## Air Travel

The AAAS has arranged with *United Airlines* and *Delta Air Lines* the following discounted air fares for your travel to and from the Annual Meeting:

- 40% off any *regular* coach fare (no minimum stay or advance purchase required)
- 5% off any *discounted* or *promotional* fare (subject to availability and qualifying conditions)

These fares are available for travel between 10 February and 22 February 1987. To make reservations, call one of the toll-free numbers below, and give the appropriate AAAS convention account number.

**United Airlines:** AAAS Convention Account No. 7018D; 800-521-4041 (7 days a week, 8:00 a.m.–11:00 p.m., Eastern time).

**Delta Air Lines:** AAAS Convention Account No. R0030; 1-800-241-6760 (7 days a week, 8:30 a.m.–8:00 p.m., Eastern time).

These special fares can be obtained only through the airline convention desks, at the numbers indicated above.

## Ground Transportation

**Airport Buses** (Continental Air Transport) stop at the Hyatt Regency. *O'Hare International Airport* is located about 19 miles (45 minutes) from the city center. Buses run every half hour, between 6:00 a.m. and 11:30 p.m. One-way fare is \$9.00; round-trip, \$15.00. Cab fare is approximately \$20.00. *Midway Airport* is located about 10 miles (40 minutes) from the city center. Buses run every half hour, between 8:30 a.m. and 8:30 p.m. One-way fare is \$8.00; round-trip, \$12.00. Cab fare is approximately \$11.00.

**Taxi Fares.** Flag drop, \$1.00; each additional mile, \$1.00. From O'Hare International Airport, about \$20.00; from Midway Airport, about \$11.00.

**Parking.** The Hyatt Regency provides valet parking at the following rates: Registered hotel guests pay \$11.00 for 24 hours with in and out privileges. Those not staying in the hotel pay \$4.50 for the first hour of parking; \$1.00 for each additional hour.

## Additional Services

**Child Care.** Meeting attendants who require baby sitters or other child care services and who are staying in the Hyatt Regency should contact the hotel's concierge (312/565-1234), who keeps a register of licensed child care agencies.

**Message Center.** A message center will be located in the AAAS registration area. Call 312/565-1234 and ask for the AAAS Message Center to leave telephone messages.

**Employment Information.** Also located in the AAAS registration area will be bulletin boards for posting "positions wanted" and "positions open" notices. AAAS will not coordinate interactions between prospective employers and applicants.