AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

# SCIENCE

25 JUNE 1993
VOL. 260 • PAGES 1849–2024
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| Clone | 1801 | DO-1 | IF2 | W27 | 2A8 | FE9 | MF5 |
| Source | Mouse | Mouse | Mouse | Mouse | Mouse | Mouse | Mouse |
| Isotype | $IgG_1$ | $IgG_{2a}$ | $IgG_1$ | $IgG_{2a}$ | $IgG_{2b}$ | $IgG_1$ | $IgG_1$ |
| Works in | Human | Human | Human | Mammalian | Human | Human | Human |
| Epitope | N – Terminal | N – Terminal | N – Terminal | Not Known | C – Terminal | N – Terminal | External Domain |
| Immuno-precipitation | ◐ | ● | ● | ◐ | ●● | ●● | ● |
| Western Blotting | ● | ●● | ● | ○ | ●● | ●● | ● |
| Frozen Sections | ● | ● | ○ | ○ | ○ | ○ | ○ |
| Paraffin Sections | ● | ●● | ○ | ○ | ○ | ○ | ○ |
| Quantity | 100 µg | 100 µg | 100 µg | 100 µg | 100 µg | 100 µg | 100 µg |
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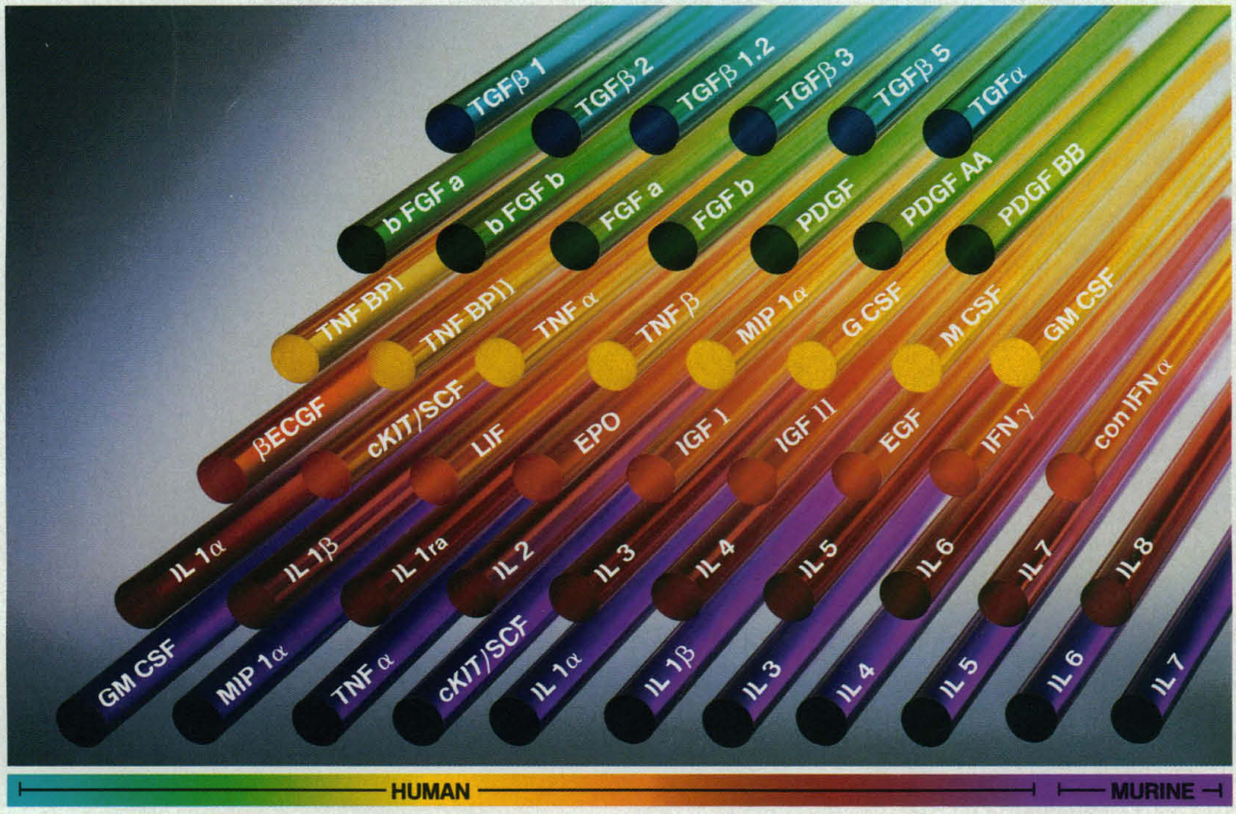


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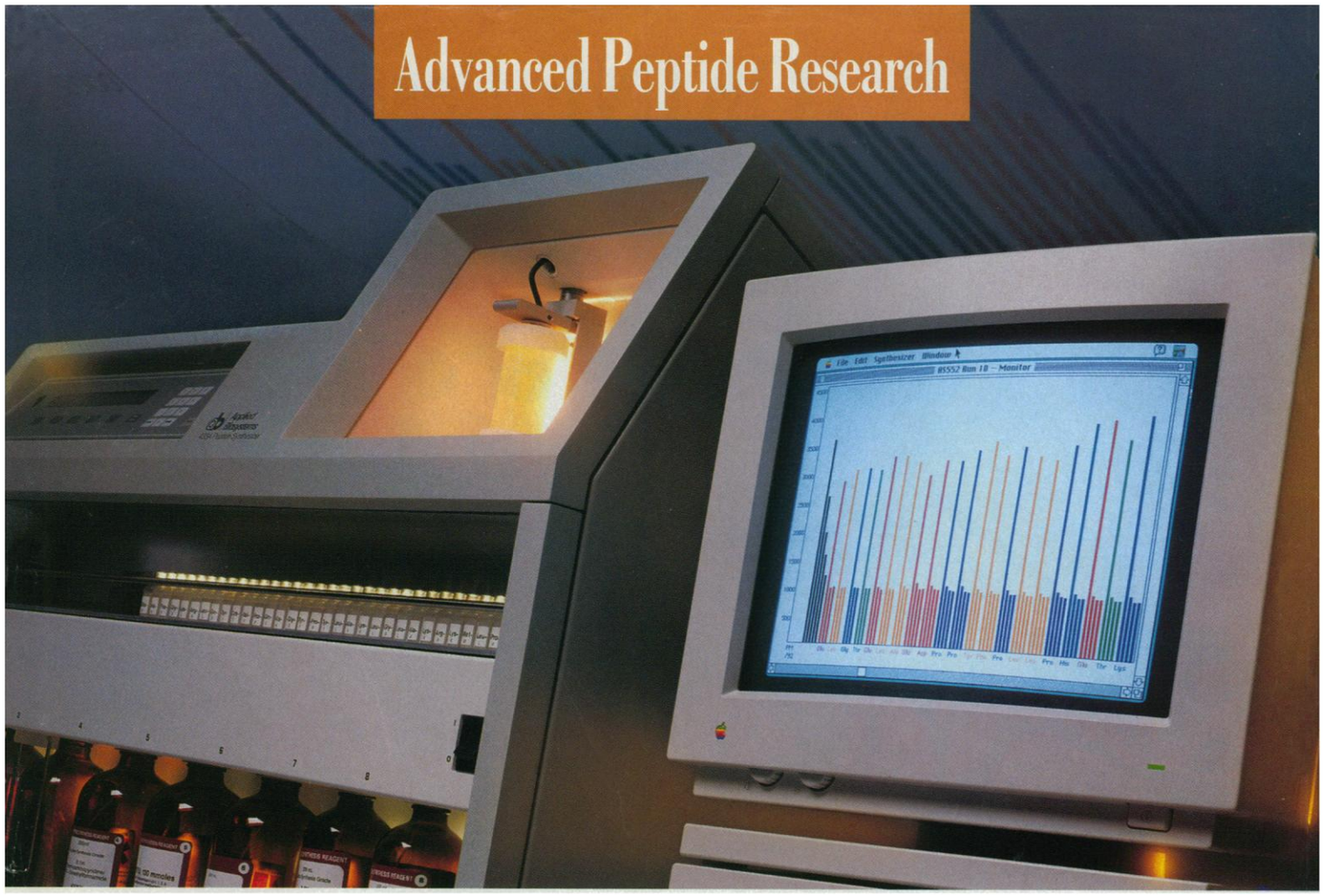


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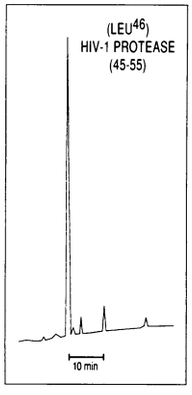


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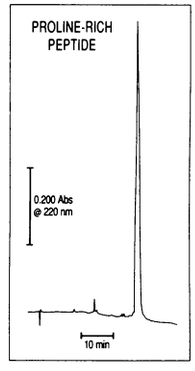


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**1883**
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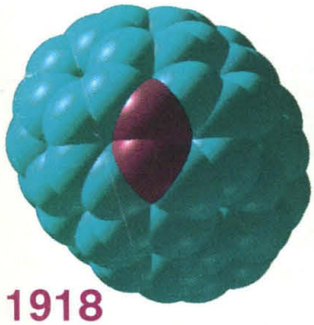


**1918**
**Handy carbon chemistry**

## NEWS & COMMENT



## RESEARCH NEWS



## POLICY FORUMS



## PERSPECTIVES



## ARTICLE



## RESEARCH ARTICLE



## DEPARTMENTS

COVER

Six-week-old spotted hyena. The provision of circulating androgens to both male and female spotted hyenas in utero may account for the masculinized genitalia of the females of this species and may potentially facilitate the intense aggression between littermates that occurs at birth. See page 1929. [Photo: R. DeFrancesco]

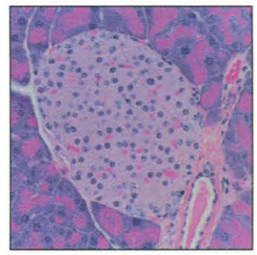

## REPORTS



## TECHNICAL COMMENTS

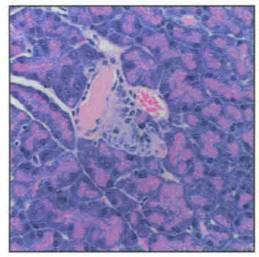


*Author Index to Volume 260 begins on page 2012*



**1942**

**Pancreatic islet degeneration in mice transgenic for interferon-α**





◩ Indicates accompanying feature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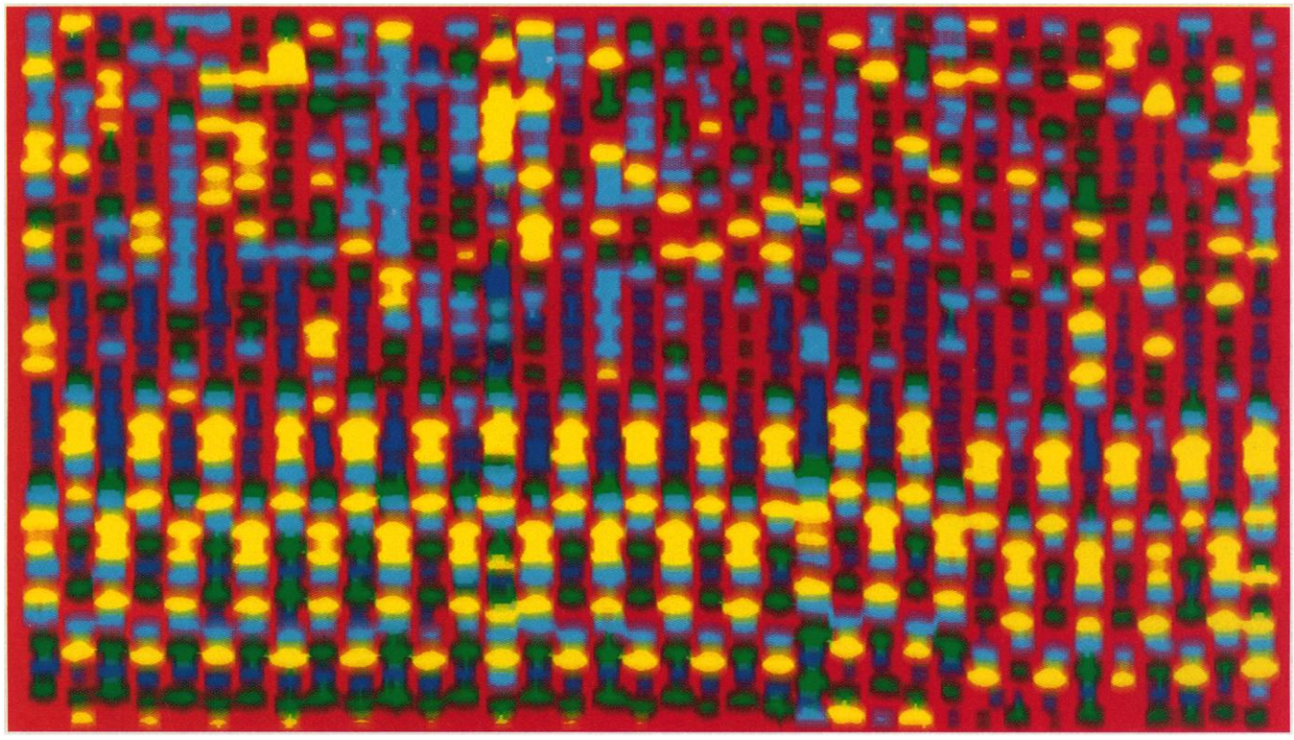

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edited by PHIL SZUROMI

## The cutting edge

Quantification of the deforestation in tropical forests and its ecological effects has been difficult. Satellite data provide the means for regional surveys necessary for understanding global effects. Skole and Tucker (p. 1905) use Landsat imagery from 1978 to 1988 to examine the extent and pattern of deforestation in Brazil and infer its likely effects. The images reveal that deforestation increased by 162,000 square kilometers—somewhat less than earlier estimates. However, many areas were near deforested sections (within 1 kilometer) because of the development of roads, power lines, and isolated clearings. Thus biologic diversity may have been severely affected over 437,000 square kilometers.

■

## Silyl cation structure

Organic chemical reactions often proceed through radical and ionic intermediate species. Although such molecules can be difficult to isolate, their structures can provide important clues for understanding reaction pathways. Lambert *et al.* (p. 1917) describe the x-ray structure of a stable silyl cation, triethylsilylium, cocrystallized with a borate anion and toluene in such a way that there is little interaction between the cation and the anion. The silyl cation retains its charge and exhibits a nonplanar geometry.

■

## Chiral carbon

In the fullerene $C_{76}$, the carbon atoms are arranged in a double-helical structure that can adopt right-handed and left-handed forms. Hawkins and Meyer (p. 1918) have resolved these two forms from the racemic mixture with the use of an osmylating agent and chiral alkaloid ligands. After separation, $C_{76}$ can be recovered by reaction with $SnCl_2$ to yield samples of optically active carbon.

■

## Alternating quakes

On the basis of observations of the magnitudes of great earthquakes around the globe during the past century, Romanowicz (p. 1923) suggests that strike-slip earthquakes, such as occur along transform faults like the San Andreas fault, and thrust earthquakes, such as occur along subduction zones, have occurred in alternating cycles of 20 to 30 years. This pattern may reflect the global transfer of stress in a systematic way between areas of plates sliding along each other at transform faults versus areas where collision is ongoing. Recognition of this pattern has implications for understanding earthquake hazards.

■

## Methylation mutant

Methylation of DNA at cytosines, which can alter DNA structure and protein binding, tends to inactivate genes and plays a role in a number of eukaryotic processes such as transcription and transposition. Vongs *et al.* (p. 1926) screened a population of *Arabidopsis thaliana* mutants for defects in methylation and isolated three independent lines that were deficient for methylation. Although this recessive mutation decreased methylation by more than 70 percent, the plants were still able to develop normally.

■

## Twice the help

During the blood-borne stage of malaria infection, $CD4^+$ T cells play a major role in the development of protective immunity. Taylor-Robinson *et al.* (p. 1931) show that both the cell-mediated ($T_H1$) and antibody-mediated ($T_H2$) helper responses play a role. In a mouse model of malaria infection, T cell clones from infected mice were transferred into mice that had their thymus removed. The $T_H1$ clones protected through a nitric oxide–mediated response, and the $T_H2$ clones protected by enhancing and accelerating a specific immunoglobulin G antibody. Unraveling these immune responses is important for developing vaccines.

■

## Inhibiting Ras modifications

Mutant Ras proteins are found frequently in human cancers of the colon and pancreas. The biological activity of normal and oncogenic Ras depends on post-translational modification in which a 15-carbon isoprenoid moiety, farnesyl, is covalently attached to the protein by farnesyltransferase. Kohl *et al.* (p. 1934) and James *et al.* (p. 1937) report the design and characterization of peptide-like synthetic inhibitors of farnesyltransferase (see news story by Travis, p. 1877). These agents inhibited Ras-induced transformation of cells in culture but did not inhibit growth of untransformed cells.

■

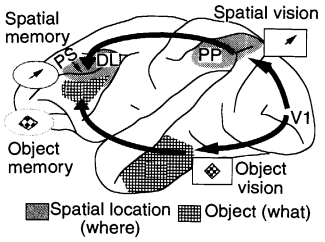
## Turning off the light-induced pathway

Arrestin has been implicated in the inactivation of the phototransduction cascade. Dolph *et al.* (p. 1910) have isolated mutations in both of the *Drosophila* arrestin genes and have examined the consequences of the inactivation of arrestin function in vivo. They find that arrestins are required to inactivate rhodopsin in vivo. In the absence of the arrestins, the photoreceptors undergo light-dependent retinal degeneration because of the inability to terminate the phototransduction cascade.

■

## Separating what and where

Visual processing in the brain conveys information about what objects are seen and where they are located. In the visual cortex, these two types of information have separate processing pathways. Wilson *et al.* (p. 1955; see news story by Service, p. 1876), working with monkeys performing visual tasks, made neuronal recordings from the prefrontal cortex, an area that mediates cognitive functions such as memory and attention.




They show that neurons in the inferior convexity (IC) have a role in the working memory of objects independent of their spatial location. Because it was previously known that the working memory for spatial location resides in the dorsolateral (DL) prefrontal cortex, these results show that parallel processing of visual information continues into the prefrontal cortex.

# Sensitive touch

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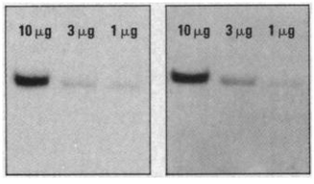


**Parallel human genomic Southern blots demonstrate the high sensitivity and low background provided by the Genius System (right, 12-min. exposure) compared to probes prepared with $^{32}P$ (left, 3-day exposure).**

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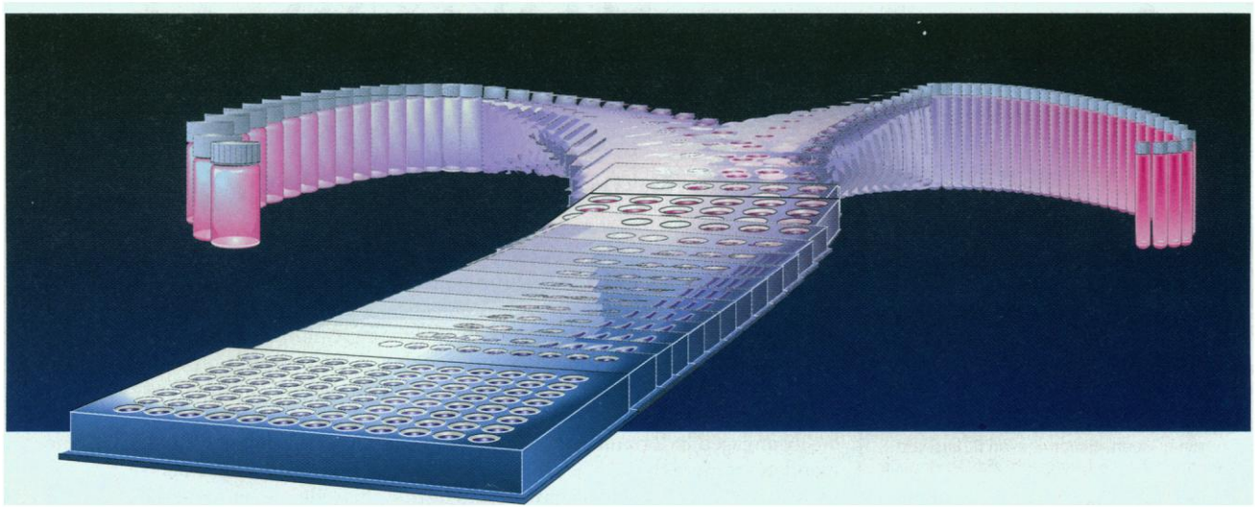

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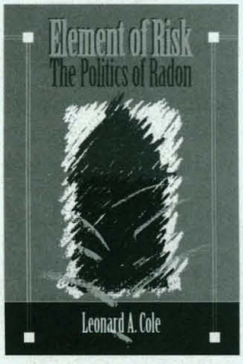


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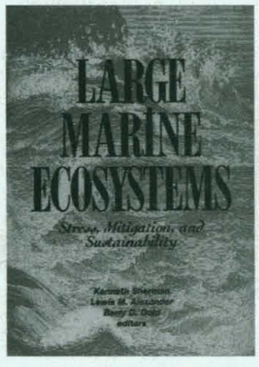


**Large Marine Ecosystems: Stress, Mitigation, and Sustainability**

Kenneth Sherman, Lewis M. Alexander, Barry D. Gold, *editors*

LMEs (large marine ecosystems) produce nearly 95% of useable marine biomass and are increasingly in danger from both natural and anthropogenic changes. This volume, based on the first international conference on LMEs, represents a multidisciplinary effort from 46 contributors to develop a more holistic approach to the research, monitoring, and management of this precious marine resource.

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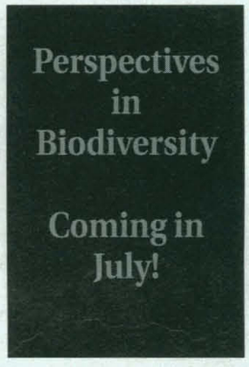


**Perspectives in Biodiversity: Case Studies in Genetic Resource Conservation and Development**

Christopher S. Potter, Joel I. Cohen, Diane Janczewski, *editors*

Deforestation, industry, and agriculture drive economic development but at what cost for the diversity of plants and animals on the planet? The continuing loss of genes, species, and ecosystems is limiting the diversity that biologists have long argued is fundamental to the maintenance of healthy, sustained ecological systems at all scales. This unique volume contains a series of cogent case studies reflecting a global cross-section of conservation efforts, united by common themes and concerns. It presents realistic applications of conservation efforts including political, economic, and social impacts.

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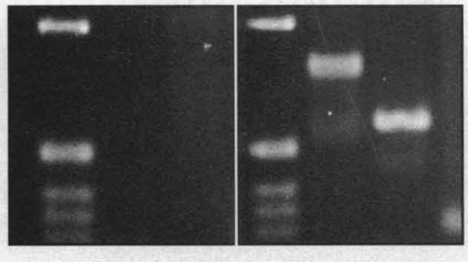

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* PCR is covered by U.S. Patent No. 4,683,202 issued to Cetus Corporation.

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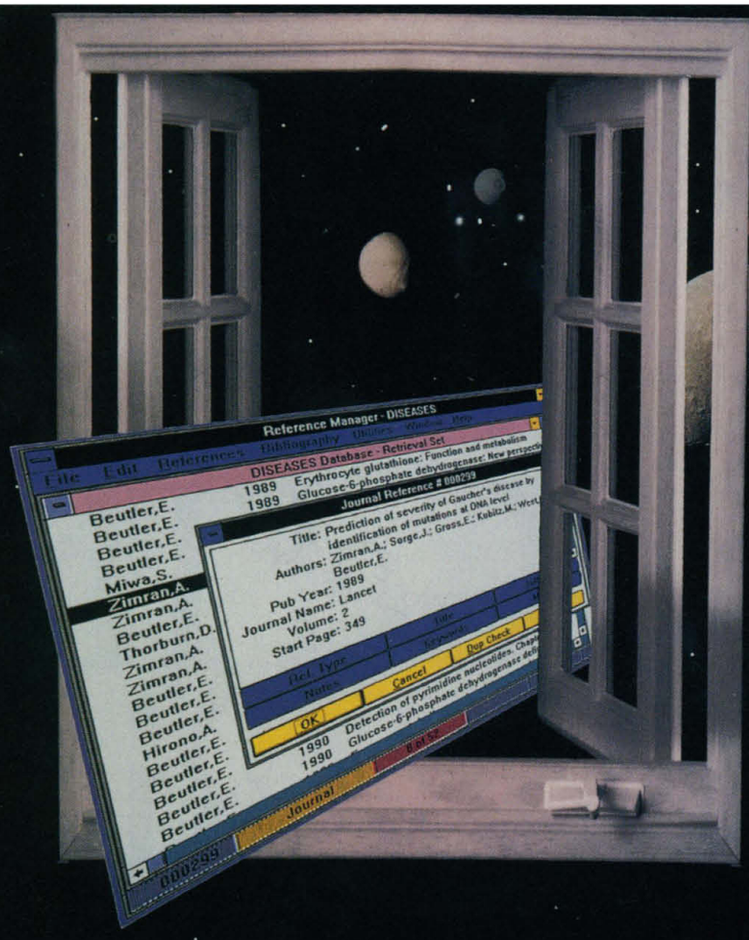


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# *A series of technical workshops on a new technique for the analytical biochemist - Matrix-assisted laser desorption mass spectrometry*

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- a complementary technique to Edman microsequencing enabling crucial verification of both the amino- and carboxy- terminal amino acids of peptides
- characterization of variant proteins
- characterization of glycoproteins and native oligosaccharides cleaved from glycoproteins

Finnigan MAT has implemented this technique into an easy-to-use bench-top system designed specifically for the biochemistry laboratory and is presenting a series of one-day seminars to provide an overview of the principles of the technique, its practical applications and the vital extra dimension it brings to the analytical biochemistry laboratory.

Topics covered will include:

- Matrix-assisted laser desorption mass spectrometry - an overview of the technique and its applications in the analytical biochemistry laboratory
- General approach to carbohydrate characterization by exo-glycosidase digestion and matrix-assisted laser desorption
- Use of the LASERMAT in the Biotechnology Program, Cornell University
- Rapid identification of proteins by database matching of proteolytic peptide masses as an alternative to Edman protein sequence analysis.

| | | | |
|---|---|---|---|
| **DATE** | **Monday 19th July** | **VENUE** | **Boston** |
| | **Tuesday 20th July** | | **Philadelphia** |
| | **Thursday 22nd July** | | **Seattle** |
| | **Friday 23rd July** | | **San Francisco** |

There will be no charge for entrance but registration will be limited. It is recommended that you register as soon as possible by calling LoAnn Roe on (408) 433 4828 x 2523 or fax (408) 435 1481

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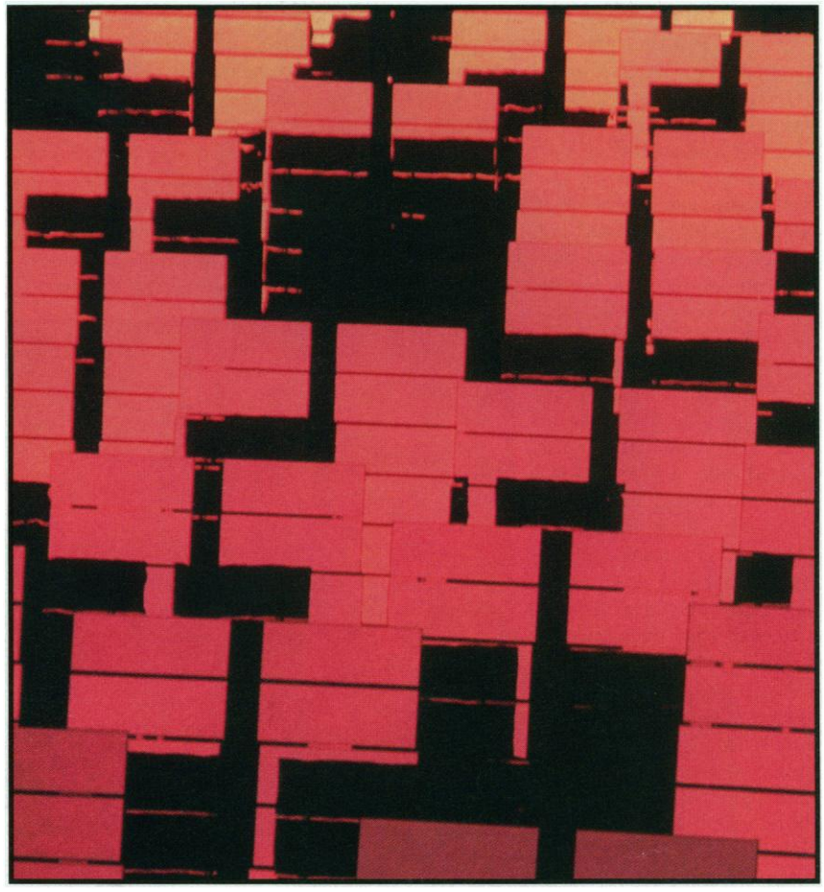
SCIENCE

# Environment and the Economy

## A Special Report



See also the related policy forums (pp. 1897 and 1900), article (p. 1905), and editorial (p. 1859).



PETER MENZEL

**Clean technology.** The photograph on this page shows an array of mirrors at a solar power plant near Barstow, California, where they relay sunlight to a central collector.

Tracy Keaton, *design*
Kim Wood, *photo research*
Linda C. Owens, *production*
Troy Gately, *copy editor*

"Our future depends on maintaining a sustainable environment," President-elect Clinton said last December, "and in doing that we can create economic opportunity." After more than 20 years in which the forces of environmentalism and economic growth have often been at odds, that's a provocative notion. But President Clinton is far from the only leader arguing that economic growth and environmental protection are complementary. In fact, the idea has become an article of faith in government, environmentalist groups, and even some parts of industry.

But is it true? Can green ideas and greenbacks really go hand in hand? In this special report, *Science* takes a look behind the bold claims, to examine the technologies and strategies aimed at promoting this union. Among them: ideas for harnessing market forces for environmental protection, "green" technologies that are said to open new markets while benefiting the environment, and methods for reducing the environmental impact of farming and forestry while keeping profits high.

All in all, this hard look at green thinking suggests that so far, the article of faith isn't fully supported by the facts. Some schemes, such as an effort to create wetlands to replace those lost to development, have fallen well short of conservationists' hopes; others, like utilities' forays into windpower, have struggled economically. Yet still others, such as less disruptive means of harvesting the tropical forests, do seem to be doing a good job by both economic and environmental criteria. And even if this unlikely marriage isn't perfectly smooth, just a few years ago such a union was practically unthinkable.

–Tim Appenzeller

**1993**
**AAAS Philip Hauge Abelson Prize**
**Nominations Invited**

The AAAS Philip Hauge Abelson Prize, established by the AAAS Board of Directors in 1985, is awarded annually either to:

- **a public servant,** in recognition of sustained exceptional contributions to advancing science, or
- **a scientist** whose career has been distinguished both for scientific achievement and for other notable services to the scientific community.

AAAS members are invited to submit nominations now for the 1993 prize, to be awarded at the 1994 Annual Meeting in San Francisco.

Each nomination must be seconded by at least two other AAAS members.

Nominations should be typed and should include the following information: the nominator's name, address, and phone number; the nominee's name, title, address, and brief biographical resume (please do not send lengthy publication lists); statement of justification for the nomination; and names, identification, and signatures of the three or more AAAS member sponsors.

The winner will be selected by a seven-member selection panel. The Prize consists of a plaque and $2,500. The award recipient is reimbursed for travel and hotel expenses incurred in attending the award presentation.

Nominations should be submitted to Stephen D. Nelson, Directorate for Science and Policy Programs, AAAS, 1333 H Street, NW, Washington, DC 20005, for receipt **by August 1, 1993.**

# SCIENCE
## INNOVATION

## 1993

# The Conference on New Research Techniques

BOSTON, MASSACHUSETTS
6-10 AUGUST 1993
HYNES CONVENTION CENTER

## REVISED & EXPANDED PROGRAM

Concurrent discussion sessions
Exhibitor workshops
Plus plenary lectures featuring some of the greatest minds in biomedical research

**REGISTER NOW AND SAVE UP TO $100**
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*(See inside for details.)*

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# SCIENCE INNOVATION

## 1993

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## TABLE OF CONTENTS



## DEAR COLLEAGUE:

Here is the revised & expanded program for SCIENCE INNOVATION '93, a refreshingly different presentation of new technologies and instruments in research and development.

As we all know, novel technology developments have played a pivotal role to propel research and generate new knowledge. A most vivid example is the recent discovery of PCR, which has revolutionized the concept and practice of molecular biology and genetics.

Thus, this meeting uniquely focuses on the process of research rather than on its findings. It showcases new technologies and instruments that scientists can use to conduct their own research more effectively. It also enables investigators to learn not only about new technologies but also about new applications of existing technologies.

The meeting program has been constantly refined to ensure that the presentation will represent the very cutting edge of biomedical research. It has been carefully structured to provide both a broad understanding of available new technologies and the detailed information you need to adapt specific techniques and applications to solve problems in your own area of research.

The organization of the conference is such that overviews of new technologies will be presented as plenary lectures in the mornings and evenings. The afternoons feature a selection of concurrent discussion sessions. Furthermore, you can exchange ideas with your colleagues at the poster sessions and experience the new technologies up close in the exhibition, as well as in the exhibitor workshops.

Finally, you will also have the opportunity to preview Emerging Technologies at a unique, last-day session highlighting the next frontiers of science.

Register now by completing and returning the Registration Form on page fourteen. I look forward to seeing you in Boston.

Savio L.C. Woo, Ph.D.
Science Innovation '93 Program Chair

## Here's What Scientists Said About Science Innovation '92

*"...this was an exciting meeting, one of the best I've attended in recent years."*

— an M.D. doing chemistry research at a university

*"Well organized, excellent speakers, good floor layout."*

— a Ph.D. Biochemist working in industry

*"The workshops were great... I learned quite a bit."*

— a Ph.D. Cell Biologist working in industry

## You Should Attend If You Are...

- seeking to implement new techniques or buy new instruments
- trying to achieve better results from your technique
- faced with a research problem that your current lab techniques just won't solve
- looking for ideas from bench scientists to improve your instruments and technologies
- ready to unveil a new technique or technology to the scientific community
- responsible for supporting, directing, or communicating your lab's cutting edge research
- exploring ways to transfer basic research technology to new industrial products and medical applications
- curious about a technology in another field

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**Savio L. C. Woo**
*Professor of Cell Biology and Molecular Genetics*
Baylor College of Medicine
*Science Innovation '93 Program Chair*

# Program at a glance

## FRIDAY, 6 AUGUST

**Noon–8:00pm**
**REGISTRATION**

**Noon–6:00pm**
**EMPLOYMENT EXCHANGE**

**5:00–7:00pm**
**EXHIBITION OPENING AND RECEPTION**

**7:00–7:15pm**
**INTRODUCTION**
*Savio L.C. Woo*

**7:15–8:15pm**
**THOMAS ALVA EDISON LECTURE**
*Kary Mullis*

**8:15–9:15pm**
**KEYNOTE ADDRESS**
*George Brown, Jr.*
*U.S. Congress*

## SATURDAY, 7 AUGUST

**7:00am–9:00pm**
**REGISTRATION**

**7:30am–6:00pm**
**EMPLOYMENT EXCHANGE**

**8:00–11:00am**
**PLENARY LECTURES**
*Francis S. Collins*
*Eric Lander*
*Kenneth W. Culver*
*Ivar Giaever*

**8:30am–12:45pm**
**CAREER DEVELOPMENT SEMINARS**

**10:00am–3:00pm**
**EXHIBITS**

**11:00–11:20am**
**COFFEE BREAK**

**11:20am–12:30pm**
**EMERGING TECHNOLOGIES**
*Alan Garfinkel*
*Flossie Wong-Staal*

**12:30–2:30pm**
**LUNCH**

**1:00–2:15pm**
**CONCURRENT EXHIBITOR WORKSHOPS**

**PREPARATIVE ELECTROPHORESIS TECHNIQUES**
*Hoefer Scientific Instruments*

**AUTOMATED INFRARED DNA SEQUENCING**
*Li-Cor*

**DATA ACQUISITION, ANALYSIS & PRESENTATION IN MICROSOFT WINDOWS**
*MicroCal Software, Inc.*

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*MicroPatent®*

**CENTRIFUGAL PROTEIN CONCENTRATION WITH CENTRICELL**
*Polysciences, Inc.*

**2:30–5:00pm**
**CONCURRENT DISCUSSIONS**
*(Additional speakers to be selected from poster presenters.)*

**DNA AMPLIFICATION**
*Julian Gordon*
*Francois Ferre*

**OLIGONUCLEOTIDE SYNTHESIS, ANTISENSE & ANTIGENE PHARMACEUTICALS**
*Paul Zamecnik*
*Mark Matteucci*

**SENSORS**
*Raoul Kopelman*
*David R. Walt*

**TUMOR IMMUNOGENICITY & MARKERS**
*Jim Allison*
*Gary J. Nabel*

**NEW MICROSCOPY**
*Robert D. Black*

**CARBOHYDRATE STRUCTURE ANALYSIS & GLYCOBIOLOGY**
*John C. Klock*

**GENE TRANSFER**
*Alan Colman*
*Oliver Smithies*
*George Stamatoyannopoulos*

**5:00–7:00pm**
**POSTER SESSION/ EXHIBITS**

**5:00–6:00pm**
**CAREER DEVELOPMENT SEMINARS**

**8:00–10:30pm**
**EVENING CONCURRENT PLENARY LECTURES**

**PATENT LAW**
*Lynn H. Pasahow*
*Kevin Kaster*

**SOLID PHASE SYNTHESIS**
*Marvin H. Caruthers*
*Stephen B.H. Kent*

**VECTOR DEVELOPMENT FOR GENE THERAPY**
*Joseph C. Glorioso*
*Richard Jude Samulski*
*Ron Crystal*

## SUNDAY, 8 AUGUST

7:00am–9:00pm
**REGISTRATION**

7:30am–6:00pm
**EMPLOYMENT EXCHANGE**

8:00–10:00am
**PLENARY LECTURES**
*George M. Whitesides*
*Robert Langer*

8:30am–12:45pm
**CAREER DEVELOPMENT SEMINARS**

10:00–10:30am
**COFFEE BREAK**

10:00am–3:00pm
**EXHIBITS**

10:30am–12:30pm
**PLENARY LECTURES**
*Donald Hilvert*
*Steven M. Block*

12:30–2:30pm
**LUNCH**

1:00–2:15pm
**CONCURRENT EXHIBITOR WORKSHOPS**

**NOVEL TECHNIQUES FOR WESTERN BLOTTING & NUCLEIC ACID DETECTION/ QUANTIFICATION**
*Amersham Corp*

**TIMESAVING ULTRAFILTRATION PROTOCOLS**
*Amicon, Inc.*

**IMMUNOCHEMICAL STAINING TECHNIQUES**
*Dako Corp*

**RAPID DNA SEQUENCING WITH THE GENESPRINTER SYSTEM**
*Fotodyne*

**FLUORESCENCE IMAGE ANALYSIS**
*Molecular Dynamics*

2:30–5:00pm
**CONCURRENT DISCUSSIONS**
*(Additional speakers to be selected from poster presenters.)*

**NONINVASIVE DIAGNOSTICS**
*Christopher Green*

**DRUG TARGETING & LIPOSOMES**
*Phillip L. Felgner*
*W. Mark Saltzman*

**CLINICAL IMMUNOLOGY/ IMMUNOSUPPRESSION/ VACCINES**
*Gene M. Shearer*
*Margaret A. Liu*
*Mario Clerici*

**BLOOD SUBSTITUTES**
*David Anderson*
*Thomas H. Schmitz*
*Antony Mathews*

**CHEMICAL COMMUNICATION**
*May R. Berenbaum*

**FLUORESCENT IN SITU HYBRIDIZATION & NONISOTOPIC DETECTION**
*Irena Bronstein*
*Jeanne Lawrence*

**NMR DETERMINATION OF PROTEIN STRUCTURE**
*Stephen Mayo*

**ANTIBODY CATALYSIS**
*Donald Landry*
*Louis J. Liotta*

5:00–7:00pm
**POSTER SESSION/ EXHIBITS**

5:00–6:00pm
**CAREER DEVELOPMENT SEMINARS**

8:00–10:30pm
**EVENING CONCURRENT PLENARY LECTURES**

**ENGINEERING PROTEINS**
*David A. Tirrell*
*Charles S. Craik*
*Cori Gorman*
*David Y. Jackson*

## MONDAY, 9 AUGUST

7:00am–9:00pm
**REGISTRATION**

7:30am–6:00pm
**EMPLOYMENT EXCHANGE**

8:00–10:00am
**PLENARY LECTURES**
*Robert B. Goldberg*
*William E. Timberlake*

8:30am–12:45pm
**CAREER DEVELOPMENT SEMINARS**

10:00–10:30am
**COFFEE BREAK**

10:00am–3:00pm
**EXHIBITS**

10:30am–12:30pm
**PLENARY LECTURES**
*Jack Belliveau*
*David Housman*

12:30–2:30pm
**LUNCH**

1:00–2:15pm
**CONCURRENT EXHIBITOR WORKSHOPS**

**PROPHET SYSTEM WORKSHOP**
*BBN Systems and Technologies*

**PRINCIPALS OF FLUORESCENCE POLARIZATION AND THE FPM-1 SYSTEM**
*Jolley Consulting & Research, Inc.*

**NASA ACCESS MECHANISM-GRAPHICAL USER INTERFACE INFORMATION RETRIEVAL SYSTEM**
*NASA Scientific and Technical Information Program*

**SPEEDING UP RESEARCH WITH ELECTRONIC AUTORADIOGRAPHY**
*Packard Instruments*

**INTRODUCTION TO *MATHEMATICA*®**
*Wolfram Research, Inc.*

2:30–5:00pm
**CONCURRENT DISCUSSIONS**
*(Additional speakers to be selected from poster presenters.)*

**SCREENING**
*Joe Gray*
*Michael H. Wigler*

**GENE SEQUENCING TOOLS: MASS SPECTROMETRY AND OTHER METHODS**
*Graham Cooks*
*Lloyd Smith*

**PEPTIDES & COMBINATORIAL LIBRARIES**
*Ronald Hoess*
*William DeGrado*
*Richard A. Houghten*
*Jon Ellman*

**FUNCTIONAL MAGNETIC RESONANCE IMAGING**
*Paul A. Bottomley*
*Kamil Ugurbil*
*Charles Dumoulin*
*Robert R. Edelman*
*Thomas J. Brady*

**DNA DIAGNOSTICS**
*C. Thomas Caskey*
*Janet D. Rowley*

**DRUG DESIGN**
*Ray Salemme*
*Joan S. Brugge*

**GROWTH FACTORS, CYTOKINES & THEIR RECEPTORS**
*Joost J. Oppenheim*
*Michael Klagsbrun*
*Herb Lin*
*Andrew Geiser*

**PLANT DEVELOPMENT**
*Robert Fraley*

**ROBOTICS & NEURAL NETWORKS**
*Daniel S. Levine*
*Bruce Bullock*
*Paolo Gaudiano*
*Samuel Leven*

**AIDS RESEARCH & ANIMAL MODELS**
*Ronald C. Desrosiers*

5:00–6:00pm
**CAREER DEVELOPMENT SEMINARS**

5:00–7:00pm
**POSTER SESSION**

8:00–10:30pm
**EVENING CONCURRENT PLENARY LECTURES**

**GENOMIC LIBRARIES**
*David C. Page*
*Nat Sternberg*
*Jean-Michel H. Vos*
*Melvin Simon and Hiroaki Shizuya*
*F. William Studier*

**RNA & IN VITRO GENETIC SELECTION**
*Jack Szostak*
*Julius Rebek*

## TUESDAY, 10 AUGUST

7:00am–3:00pm
**REGISTRATION**

8:00–10:00am
**PLENARY LECTURES**
*David J. States*
*William R. Jacobs, Jr.*

9:00am–1:00pm
**EMPLOYMENT EXCHANGE**

10:00–10:30am
**COFFEE BREAK**

10:30am–12:30pm
**EMERGING TECHNOLOGIES**
*Wah Chiu*
*Daniel A. Abramowicz*

12:30–2:00pm
**LUNCH**

2:00–5:00pm
**EMERGING TECHNOLOGIES**
*John E. Buster*
*Mark R. Hughes*
*Peter S. Linsley*
*Julian Rosenman*
*David S. Bredt*

# Science Innovation '93 Revised & Expanded Program

**Hynes Convention Center**
**Boston**
**6-10 August 1993**

## Friday, 6 August

Noon–8:00pm
### Registration

Noon–6:00pm
### Employment Exchange

5:00–7:00pm
### Exhibition Opening and Reception

7:00–7:15pm
### Introduction
**Savio L.C. Woo**
*Baylor Coll of Med and*
*Science Innovation '93 Program Chair*

7:15–8:15pm
### Thomas Alva Edison Lecture

**Kary Mullis**
*Atomic Tags*
DNA amplification.

8:15–9:15pm
### Keynote Address

**George Brown, Jr.**
*U.S. Congress*
Technology in perspective.

## Saturday, 7 August

7:00am–9:00pm
### Registration

7:30am–6:00pm
### Employment Exchange

8:00–11:00am
### Plenary Lectures

**Francis S. Collins**
*Natl Ctr for Human Genome Rsch*
The Human Genome Project, biotechnology, and preventive medicine.

**Eric Lander**
*Whitehead Inst*
Gene mapping.

**Kenneth W. Culver**
*Genetic Therapy, Inc.*
Gene therapy for cancer and immunodeficiency.

**Ivar Giaever**
*Renssalaer Polytechnic Inst/Applied Biophysics, Inc*
An electrical sensor that eavesdrops on cells in tissue culture.

8:30am–12:45pm
### Career Development Seminars

10:00am–3:00pm
### Exhibits

11:00–11:20am
### Coffee Break

11:20am–12:30pm
### Emerging Technologies
**Alan Garfinkel**
*Univ of California-Los Angeles*
Chaos control in cardiac and other physiological systems.

**Flossie Wong-Staal**
*Univ of California-San Diego*
Towards the development of ribozyme gene therapy against AIDS.

12:30–2:30pm
### Lunch

1:00–2:15pm
### Concurrent Exhibitor Workshops

**PREPARATIVE ELECTROPHORESIS TECHNIQUES**
*Hoefer Scientific Instruments*

**AUTOMATED INFRARED DNA SEQUENCING**
*Li-Cor*
Advanced infrared technology for DNA sequencing and its application to the new Model 4000 Automated DNA Sequencer will be reviewed. High throughput and reliability for cost-effective sequencing are achieved using a solid-state IR laser and fluorescence detection microscope.

**DATA ACQUISITION, ANALYSIS & PRESENTATION IN MICROSOFT WINDOWS**
*MicroCal Software, Inc.*
Origin, a scientific plotting and data analysis software designed specifically for Windows, features a spreadsheet interface and produces high-quality publication graphs in a standard Windows point-and-click environment. Due to Origin's open architecture and a powerful built-in scripting language, Data Acquisition and Device Controls capabilities can be added to the software through available modules.

**PATENT SEARCHING FOR R&D AND COMPETITIVE INTELLIGENCE**
*MicroPatent®*
This workshop will cover all aspects of U.S. and European patent searching on CD-ROM for R&D, competitive intelligence, and early alert information. Two new biotechnology editions will be demonstrated.

**CENTRIFUGAL PROTEIN CONCENTRATION WITH CENTRICELL**
*Polysciences, Inc.*
Centricell Centrifugal Ultrafiltration devices will be demonstrated for the concentration of dilute protein solutions in large volumes of 20-60 ml. Immersible Polysulfone Ultrafilters will be demonstrated for the concentration of even larger volumes of 100-200 ml.

2:30–5:00pm
## Concurrent Discussions

*(Additional speakers to be selected from poster presenters.)*

**DNA AMPLIFICATION**
**Julian Gordon**
*Abbott Labs*

**Francois Ferre**
*Immune Response Corp*
PCR technology: Sharpening PCR as a quantitative tool.

**OLIGONUCLEOTIDE SYNTHESIS, ANTISENSE & ANTIGENE PHARMACEUTICALS**
**Paul Zamecnik**
*Worcester Fndn for Exptl Biology*
Antisense oligonucleotides: Therapeutic targets and relative efficacy of modifications.

**Mark Matteucci**
*Gilead Sciences*
Oligonucleotide structural modifications for enhancement of antisense and antigene activity.

**SENSORS**
**Raoul Kopelman**
*Univ of Michigan*

**David R. Walt**
*Tufts Univ*

**TUMOR IMMUNOGENICITY & MARKERS**
**Jim Allison**
*Univ of California-Berkeley*

**Gary J. Nabel**
*HHMI/Univ of Michigan*
Molecular genetic interventions for human cancer.

**NEW MICROSCOPY**
**Robert D. Black**
*Duke Univ Med Ctr*
Nuclear magnetic resonance microscopy.

**CARBOHYDRATE STRUCTURE ANALYSIS & GLYCOBIOLOGY**
**John C. Klock**
*Glyko Inc*
New techniques for profiling and sequencing carbohydrates.

**GENE TRANSFER**
**Alan Colman**
*Pharmaceutical Proteins Ltd*
Protein production in transgenic animals.

**Oliver Smithies**
*Univ of North Carolina*
On making animal models of genetic disorders.

**George Stamatoyannopoulos**
*Univ of Washington*
YAC transfer to transgenic mice and erythroleukemia cells.

5:00–7:00pm
## Poster Session/Exhibits

5:00–6:00pm
## Career Development Seminars

8:00–10:30pm
## Evening Concurrent Plenary Lectures

**PATENT LAW**

**Lynn H. Pasahow**
*McCutchen, Doyle, Brown & Enersen*
An overview of the patent system, and why you might care.

**Kevin Kaster**
*Affymax*

**SOLID PHASE SYNTHESIS**
**Marvin H. Caruthers**
*Univ of Colorado*
Synthesis of polynucleotides and polynucleotide analogs.

**Stephen B.H. Kent**
*Scripps Rsch Inst*
Total chemical synthesis of enzymes.

**VECTOR DEVELOPMENT FOR GENE THERAPY**

**Joseph C. Glorioso**
*Univ of Pittsburgh Sch of Med*
Development of *Herpes simplex* virus as a gene transfer vector for the nervous system.

**Richard Jude Samulski**
*Univ of Pittsburgh*
Adeno-associated virus.

**Ron Crystal**
*Cornell Univ Med Coll*
Adeno-virus vectors: In vivo gene therapy.

## Sunday, 8 August

7:00am–9:00pm
## Registration

7:30am–6:00pm
## Employment Exchange

8:00–10:00am
## Plenary Lectures

**George M. Whitesides**
*Harvard Univ*
The science of organic interfaces.

**Robert Langer**
*MIT*
Drug delivery and tissue engineering.

8:30am–12:45pm
## Career Development Seminars

10:00–10:30am
## Coffee Break

10:00am–3:00pm
## Exhibits

10:30am–12:30pm
## Plenary Lectures

**Donald Hilvert**
*Scripps Rsch Inst*
Antibody catalysis.

**Steven M. Block**
*Rowland Inst for Science/Harvard Univ*
Tracking down kinesin using optical tweezers.

12:30–2:30pm
## Lunch

1:00–2:15pm
## Concurrent Exhibitor Workshops

**NOVEL TECHNIQUES FOR WESTERN BLOTTING & NUCLEIC ACID DETECTION/QUANTIFICATION**
*Amersham Corp*
Two ECL systems are designed for labeling DNA probes, two for labeling oligonucleotides, and one for Western blotting. SPA provides a novel homogeneous assay format to enable sensitive detection and quantitation of PCR products. The impact of these new techniques will be described.

**TIMESAVING ULTRAFILTRATION PROTOCOLS**
*Amicon, Inc.*

Membrane-based protocols often save time and increase recovery. A detailed review will be presented along with results generated by the protocols. The speed and convenience of Membrane Affinity Chromatography for isolation of IgG will be demonstrated.

**IMMUNOCHEMICAL STAINING TECHNIQUES**
*Dako Corp*

This workshop will present the basic theories and methodologies of immunochemical stains, then allow participants to apply them in a practical, hands-on application using a labeled streptavidin-biotin (LSAB or LSAB2) test system. It will cover some basic immunology; polyclonal and monoclonal antibodies; and enzymatic and other markers that can be used in immunochemical staining procedures.

**RAPID DNA SEQUENCING WITH THE GENESPRINTER SYSTEM**
*Fotodyne*

Fotodyne scientists will demonstrate the GeneSprinter Sequencing System. Preparation of uniform 50mm thick gels, rapid electrophoretic separation, gel fixation and drying, and autoradiography will be shown.

**FLUORESCENCE IMAGE ANALYSIS**
*Molecular Dynamics*

A new, fluorescence-based imaging strategy offers improved speed and accuracy over traditional autoradiography and chemiluminescence methods. FluorKit applications to be discussed include DNA fragment analysis (molecular weight and quantity determinations), DNA quantitation in microtitre plates, protein kinase assays, and CAT assays.

2:30–5:00pm
## Concurrent Discussions
*(Additional speakers to be selected from poster presenters.)*

**NONINVASIVE DIAGNOSTICS**
**Christopher Green**
*General Motors*

**DRUG TARGETING & LIPOSOMES**
**Phillip L. Felgner**
*Vical Inc*

**W. Mark Saltzman**
*Johns Hopkins Univ*

Controlled drug delivery using genes and polymers.

**CLINICAL IMMUNOLOGY/ IMMUNOSUPPRESSION/VACCINES**
**Gene M. Shearer**
*National Cancer Inst/NIH*

Finding an efficacious prophylactic AIDS vaccine.

**Margaret A. Liu**
*Merck Rsch Labs*

New vaccine technologies and their applications.

**Mario Clerici**
*National Cancer Inst/NIH*

TH1-like and TH2-like cytokines in HIV infection.

**BLOOD SUBSTITUTES**
**David Anderson**

Recombinant hemoglobin drug delivery.

**Thomas H. Schmitz**
*Baxter Healthcare Corp*

**Antony Mathews**
*Somatogen*

Hemoglobin-based blood substitutes.

**CHEMICAL COMMUNICATION**
**May R. Berenbaum**
*Univ of Illinois at Urbana-Champaign*

Chemical cryptography: Deciphering and disrupting plant-insect signalling.

**FLUORESCENT IN SITU HYBRIDIZATION & NONISOTOPIC DETECTION**
**Irena Bronstein**
*Tropix*

**Jeanne Lawrence**
*Univ of Massachusetts-Worchester*

**NMR DETERMINATION OF PROTEIN STRUCTURE**
**Stephen Mayo**
*California Inst of Technology*

**ANTIBODY CATALYSIS**
**Donald Landry**
*Columbia Univ*

**Louis J. Liotta**
*Pennsylvania State Univ*

Combinatorial antibody libraries for metal-mediated catalysis.

5:00–7:00pm
## Poster Session/Exhibits

5:00–6:00pm
## Career Development Seminars

8:00–10:30pm
## Evening Concurrent Plenary Lectures

**ENGINEERING PROTEINS**
**David A. Tirrell**
*Univ of Massachusetts*

Departing from nature: Genetic engineering of solid state properties of artificial proteins.

**Charles S. Craik**
*Univ of California-San Francisco*

Engineering proteases.

**Cori Gorman**
*Megabios*

Engineering proinsulin processing to insulin.

**David Y. Jackson**
*Genentech Inc*

Protein synthesis via enzymatic ligation of synthetic peptide fragments.

## Monday, 9 August

7:00am–9:00pm
## Registration

7:30am–6:00pm
## Employment Exchange

8:00–10:00am
## Plenary Lectures

**Robert B. Goldberg**
*Univ of California-Los Angeles*

Molecular and genetic dissection of plant development: The power of insertional mutagens.

**William E. Timberlake**
*Myco Pharmaceuticals, Inc*

Capturing metabolic diversity from fungi.

8:30am–12:45pm
## Career Development Seminars

10:00–10:30am
## Coffee Break

10:00am–3:00pm
## Exhibits

10:30am–12:30pm

## Plenary Lectures

**Jack Belliveau**
*Harvard Univ*
Neuroimaging.

**David Housman**
*MIT*
Oncogenes and cancer.

12:30–2:30pm

## Lunch

1:00–2:15pm

## Concurrent Exhibitor Workshops

**PROPHET SYSTEM WORKSHOP**
*BBN Systems and Technologies*
PROPHET is an NIH-sponsored software package that gives life scientists tools for manipulating, analyzing, and presenting data tables, graphs, and statistical analyses. PROPHET's point-and-click graphical user interface provides easy access to a rich variety of analysis tools.

**PRINCIPALS OF FLUORESCENCE POLARIZATION AND THE FPM-1 SYSTEM**
*Jolley Consulting & Research, Inc.*
The theory and practice of fluorescence polarization (FP) will be discussed. The use of FP for affinity constant determination, therapeutic drug determination, and DNA detection will be described in detail.

**NASA ACCESS MECHANISM-GRAPHICAL USER INTERFACE INFORMATION RETRIEVAL SYSTEM**
*NASA Scientific and Technical Information Program*
The NASA Access Mechanism's capabilities to support information discovery and retrieval and peer networking will be discussed. The outcome of the prototype evaluation at NASA will be described.

**SPEEDING UP RESEARCH WITH ELECTRONIC AUTORADIOGRAPHY**
*Packard Instruments*
The InstantImager and its software will be demonstrated. The advantages of electronic autoradiography for accelerating biological research will be discussed.

**INTRODUCTION TO *MATHEMATICA®***
*Wolfram Research, Inc.*
This workshop is designed to serve as a basic introduction to *Mathematica*. Examples will illustrate various types of capability, including symbolic calculations, basic programming, and the use of elementary graphics.

2:30–5:00pm

## Concurrent Discussions

*(Additional speakers to be selected from poster presenters.)*

**SCREENING**
**Joe Gray**
*Univ of California-San Francisco*
Screening for genetic aberrations.

**Michael H. Wigler**
*Cold Spring Harbor Lab*
Method for comparison of complex genomes.

**GENE SEQUENCING TOOLS: MASS SPECTROMETRY AND OTHER METHODS**

**Graham Cooks**
*Purdue Univ*

**Lloyd Smith**
*Univ of Wisconsin-Madison*
New technologies for DNA sequencing.

**PEPTIDES & COMBINATORIAL LIBRARIES**
**Ronald Hoess**
*Du Pont Merck Pharmaceutical Co*
Use of constrained peptide libraries displayed on phage for epitope mapping and receptor binding.

**William DeGrado**
*Du Pont Merck Pharmaceutical Co*

**Richard A. Houghten**
*Torrey Pines Inst for Molec Studies*
Peptide and combinatorial libraries: Current capabilities and future possibilities.

**Jon Ellman**
*Univ of California-Berkeley*

**FUNCTIONAL MAGNETIC RESONANCE IMAGING**
**Paul A. Bottomley**
*General Electric Rsch & Development Ctr*
Mapping biochemicals in the body.

**Kamil Ugurbil**
*Univ of Minnesota*
Physics of functional MR brain imaging.

**Charles Dumoulin**
*General Electric Rsch & Development Ctr*
Angiography and blood flow by MR.

**Robert R. Edelman**
*Beth Israel Hosp*
The heart.

**Thomas J. Brady**
*Massachusetts Genl Hosp*
Future prospects of magnetic resonance imaging.

**DNA DIAGNOSTICS**

**C. Thomas Caskey**
*HHMI/Baylor Coll of Med*

**Janet D. Rowley**
*Univ of Chicago*
DNA diagnostics in cancer.

**DRUG DESIGN**
**Ray Salemme**
*3-Dimensional Pharmaceuticals*

**Joan S. Brugge**
*ARIAD Pharmaceuticals*
Intracellular targets for structure-based design.

**GROWTH FACTORS, CYTOKINES & THEIR RECEPTORS**
**Joost J. Oppenheim**
*National Cancer Inst/Frederick Cancer Rsch Facility*
Cytokines and cell growth factors.

**Michael Klagsbrun**
*Children's Hosp/Harvard Med Sch*

**Herb Lin**
*Harvard Univ*

**Andrew Geiser**
*NIH*
Growth factor knockout.

**PLANT DEVELOPMENT**
**Robert Fraley**
*Monsanto*

**ROBOTICS & NEURAL NETWORKS**
**Daniel S. Levine**
*Univ of Texas-Arlington*

**Bruce Bullock**
*ISX Corp*

**Paolo Gaudiano**
*Boston Univ*

**Samuel Leven**
*For a New Social Science*

**AIDS RESEARCH & ANIMAL MODELS**
**Ronald C. Desrosiers**
*Harvard Med Sch*

5:00–6:00pm
## Career Development Seminars

5:00–7:00pm
## Poster Session

8:00–10:30pm
## Evening Concurrent Plenary Lectures

GENOMIC LIBRARIES

**David C. Page**
*Whitehead Inst, MIT/HHMI*
Making and using physical maps of the human Y chromosome.

**Nat Sternberg**
*Du Pont Merck Pharmaceutical Co*
Cloning and dissection of high molecular weight genomic DNA using the Phage P1 System.

**Jean-Michel H. Vos**
*Univ of North Carolina-Chapel Hill*
Building HAECs: Human artificial episomal chromosomes.

**Melvin Simon and Hiroaki Shizuya**
*California Inst of Technology*
Mapping chromosomes with BACs and fosmids.

**F. William Studier**
*Brookhaven Natl Lab*
DNA sequencing by primer walking with strings of three hexamers.

RNA & IN VITRO GENETIC SELECTION

**Jack Szostak**
*Massachusetts Genl Hosp*

**Julius Rebek**
*MIT*
Recognition, replication, and assembly in organic chemistry.

## Tuesday, 10 August

7:00am–3:00pm
## Registration

8:00–10:00am
## Plenary Lectures

**David J. States**
*Washington Univ*
Computational genome analysis.

**William R. Jacobs, Jr.**
*HHMI/Albert Einstein Coll of Med*
Shedding new light on drug-resistant tuberculosis.

9:00am–1:00pm
## Employment Exchange

10:00–10:30am
## Coffee Break

10:30am–12:30pm
## Emerging Technologies

**Wah Chiu**
*Baylor Coll of Med*
Electron cryomicroscopy of macromolecular assembly.

**Daniel A. Abramowicz**
*General Electric Rsch & Development Ctr*
The future of bioremediation: Biodegradation of chlorinated organics.

12:30–2:00pm
## Lunch

2:00–5:00pm
## Emerging Technologies

**John E. Buster**
*Univ of Tennessee*
Hope for the infertile: Future trends in advanced reproductive technology art.

**Mark R. Hughes**
*Baylor Coll of Med*
Preimplantation genetic diagnosis: Molecular analysis of single human blastomeres.

**Peter S. Linsley**
*Bristol-Myers Squibb*
T cell costimulation and regulation of immune response.

**Julian Rosenman**
*Univ of North Carolina Sch of Med*
3-D and virtual reality in medicine.

**David S. Bredt**
*Johns Hopkins Univ*
Nitric oxide and brain messengers.

**REGISTER TODAY**

**Fax your registration form to 202-289-4021**

*(credit card payment only)*

## EMPLOYMENT EXCHANGE

The Employment Exchange is a career opportunities/career development service for job candidates and employers. Interview scheduling, position posting, a message center, job and resume referrals, career development seminars, and private interview booths are provided during the week of Science Innovation '93. If you have positions to be filled or are currently seeking employment, you should take advantage of this program.

### EMPLOYER BENEFITS

- Access to hundreds of top-notch candidates' resumes cross-referenced by discipline.
- On-site interview facilities and scheduling services at no extra charge.
- Unlimited position available postings.
- Copy of the "Pre-Meeting Bulletin," including a brief profile of candidates who are expected to attend the meeting.
- Special rates for Science Innovation exhibitors, nonprofit organizations, and AAAS Corporate Members.

### CANDIDATE BENEFITS

- FREE enrollment for AAAS member candidates. Nonmembers pay a modest $10 enrollment fee.
- Hundreds of current position openings in a variety of disciplines and experience levels.
- On-site interview facilities, including on-the-spot interviews.
- Access to full descriptions of all available positions.
- On-site career development seminars focusing on resumé writing, interview presentation skills, and career enhancement strategies.
- Employment Exchange Only fee for non-conference attendees.

### FOR MORE INFORMATION

Candidates and employers who wish to participate in the Employment Exchange please contact:

Jacquelyn Roberts, AAAS Employment Exchange
1333 H Street, NW, Suite 1163, Washington DC 20005, Phone: 202-326-6737, Fax: 202-842-1065

## LAST CHANCE FOR POSTER PAPERS

You still can apply to give a poster presentation at Science Innovation '93. Although abstracts received after 15 June 1993 cannot be published in the program book or be considered for oral presentation, they may be accepted for display.

The poster sessions at Science Innovation '93 provide an informal way for you to present your latest technique to your peers. Appropriate topics include technical developments relating to any of the SI'93 concurrent sessions. If your abstract is accepted, you will be assigned to a poster session and provided with a 4' x 4' bulletin board on which to display graphics and text. Although posters will be displayed in the Exhibit Hall during the entire meeting, presenters will be assigned two hours at their posters in which to discuss their work one-on-one with interested colleagues.

Abstracts will not be considered unless the presenter is a paid registrant of Science Innovation '93. Only one abstract per presenter may be submitted. For instructions on how to prepare and submit abstracts, see page 1143 of the 21 May 1993 issue of SCIENCE (page 7 of the SI'93 advance program) or contact the AAAS Meetings Office, phone 202-326-6450; fax 202-289-4021.

## EXHIBITS AND WORKSHOPS

The Science Innovation exhibition offers you the unique opportunity to personally examine the techniques and new technologies presented by top scientists in the morning plenary sessions. In addition, you will have the opportunity to experience hands-on demonstrations of these technologies in afternoon exhibitor workshops. You'll see first-hand how leaders in your field are using new technologies to advance their research. Attend the exhibits and workshops and arrange for implementation of new techniques and technologies in your own lab. Plan ahead—mark your calendar now with the companies you want to visit and the workshops you want to attend.

## SCIENCE INNOVATION '93 EXHIBITORS *(at press time)*

Academic Press, Inc.
Advanced Magnetics, Inc.
American Association for the Advancement of Science
Amersham Corp. *
Amicon, Inc. *
AutoDesk
BBN Systems and Technologies *
Beckman Instruments, Inc.
Bio-Rad Laboratories
Bio-Tek Instruments
BioTechniques/BioTechNet
Biotechnologies Industries Organization
Brinkmann Instruments, Inc.
Carl Zeiss, Inc.
Cell Press, Inc.
Cell Robotics, Inc.
Charles River Laboratories
Coherent, Inc.
Corning, Inc.
CPG, Inc.
Cruachem, Inc.
Dako Corp. *
David Kopf Instruments
Digene Diagnostics, Inc.
Dupont Biotechnology
Dynatech Laboratories, Inc.
Eastman Kodak
Endogen, Inc.
Finnigan MAT
Fisons Instruments
FMC BioProducts
Forma Scientific, Inc.
Fotodyne *
General Valve Corp.
Genset Corp.
Hitachi Software Engineering America, Ltd.
Hoefer Scientific Instruments *
The Humana Press
IntelliGenetics/Betagen
International Biotechnology Suppliers Association
International Equipment Co.
ISCAN, Inc.
J.T. Baker, Inc.
Jolley Consulting & Research, Inc. *
Li-Cor, Inc. *
MicroCal Software, Inc. *
MicroPatent® *
Millipore, Inc.
MJ Research, Inc.
Molecular Dynamics *
NASA Scientific and Technical Information Program *
National Biosciences, Inc.
National Instruments
National Labnet Co.
New England Biolabs, Inc.
Novex
Olympus Corp.
Owl Scientific, Inc.
Packard Instruments Company, Inc. *
Perkin-Elmer Company
PerSeptive Biosystems
Pharmacia Biotech, Inc.
Polysciences, Inc. *
Princeton Separations, Inc.
Protein & DNA ImageWare Systems, Inc.
Research Information Systems
Research Unlimited
Robbins Scientific Corp.
Science Magazine
Seikagaku America, Inc.
Sheldon Manufacturing, Inc.
Stovall Life Science, Inc.
Tecan/SLT Labinstruments
Time Logic, Inc.
Tropix, Inc.
US Dept of Energy, OTD
Wallac, Inc.
Wolfram Research, Inc. *
Yamato Scientific America and Baxter Scientific Products

* Exhibitors conducting workshops

## EXHIBITS AND WORKSHOPS

### EXHIBIT HOURS

**Friday 8/6**
Opening Reception 5:00–7:00pm
**Saturday 8/7**
10:00am–3:00pm
Break
5:00–7:00pm
**Sunday 8/8**
10:00am–3:00pm
Break
5:00–7:00pm
**Monday 8/9**
10:00am–3:00pm
**Tuesday 8/10**
Exhibits Closed

### WORKSHOP HOURS

**Friday 8/6**
No workshops
Opening Reception in Exhibit Hall
**Saturday 8/7**
1:00–2:15pm
**Sunday 8/8**
1:00–2:15pm
**Monday 8/9**
1:00–2:15pm
**Tuesday 8/10**
No workshops

*For workshop topics and descriptions see Program Schedule on pages 6–10.*

## INVITATION TO EXHIBIT

By exhibiting at Science Innovation '93, your organization can reach bench scientists from all the disciplines that contribute to the field of biomedical research.

The exhibition is the place where attendees can examine technologies cited by the plenary lecturers and workshop leaders and arrange for the implementation of those technologies in their labs. Through industry workshops and exhibits, you can forge relationships with scientists who are potential users of your products and services.

For details about exhibiting, contact Ed Leonardo at:
Phone 202-326-6462
FAX 202-289-4021

## GENERAL MEETING INFORMATION

### LOCATION

Sessions and exhibits will be in the Hynes Convention Center, 900 Boylston Street, Boston, MA.

### ON-SITE REGISTRATION HOURS

Friday 6 August, noon-8:00pm
Saturday-Monday 7-9 August, 7:00am-9:00pm
Tuesday 10 August, 7:00am-3:00pm

## FOR MORE INFORMATION CONTACT

AAAS
Meetings Dept.
1333 H Street, NW
Washington, DC 20005
Phone: 202-326-6450
Fax: 202-289-4021

## NETWORKING LUNCHES

Lunch will be available in the Exhibit Hall for Science Innovation '93 attendees seeking an extra opportunity to network with colleagues and address special research problems or questions. A sign on each table will indicate a suggested discussion topic. Topics and table numbers will be listed in the program, so you will have a chance to pick out preferred topics in advance. A very limited number of lunch tickets will be available on-site, so be sure to purchase lunch tickets when you preregister for the meeting.

**INTERESTED IN EXHIBITING?**

**Contact Ed Leonardo**
**Phone: 202-326-6462**
**Fax: 202-289-4021**

## DISCOUNT AIR FARES

Get discount airfare to Science Innovation '93 and your next flight may be free!

Make your reservations through Gil Travel to save money on discounted air fares for travel to and from Boston on selected major airlines from 30 July–13 August 1993.

- Save 10% on most unrestricted coach fares. No minimum stay required. 7-day advance reservation and ticketing required. No one-way discounts.
- Save 5% off the lowest applicable round trip fare, subject to availability.

Plus, you may win a free ticket: All Science Innovation '93 registrants who make their reservations through Gil Travel will be entered into a drawing for a round trip ticket to any location in the continental United States.

This promotional offer is available only through the Gil Travel convention reservation desk. Certain standard restrictions apply.

For details and reservations, call or fax Gil Travel at the number below. Be sure to tell them that you are attending Science Innovation '93.

Toll-free number: 1-800-223-3855
Outside the U.S.: 1-215-568-6655
Fax number: 1-215-568-0696

## TRANSPORTATION

Boston's "T" (subway) system provides convenient transportation around the city. Basic fare is $0.85. You can get a Boston Passport, which allows for unlimited "T" rides plus discounts to major tourist attractions for $5 for 1 day, $9 for 3 days, and $18 for 7 days. The passport is available at the Hynes Convention Center station. For information on public transportation from Logan airport to the Back Bay area, call MASSPORT, 24 hours a day, at 1-800-23-LOGAN.

Taxis are available around the clock; fares run about $15-20. Reserved car service is available from Logan airport to AAAS hotels for $24, refer to account 18980, by calling BostonCoach at 1-800-672-7676. Van service is available from City Transportation for $7.50 one way, $13 round trip. Meet outside baggage claim at the Courtesy Bus Lane.

## HOTEL DESCRIPTIONS

Reduced rate guest rooms are available at a number of Boston hotels if you make your reservations using the AAAS Hotel Reservation Form on page 11. Reservations must be made through the AAAS Housing Bureau and must be received by 9 July 1993.

AAAS has negotiated discounted room rates at the hotels listed. We strongly encourage you to stay at one of these official hotels. You will get a chance to meet and network informally with fellow Science Innovation participants. In addition, for each participant's stay in one of these hotels, AAAS gets credit for our part in filling the hotel. This helps to defray speaker costs, which in turn helps to keep registration fees lower. Thank you for your support.

**Sheraton Boston Hotel & Towers*,** with direct access to the Hynes Convention Center, is the largest hotel in New England. The Sheraton has a fitness center (complete with pool), business center and all the other full services to make your stay a comfortable one.

**The Back Bay Hilton,** across the street from the Hynes, prides itself on quiet and privacy (only 16 guestrooms per floor). A sundeck adjoins the pool and fitness room.

**The Colonnade Hotel,** not your ordinary convention hotel, is a small, newly renovated hotel that prides itself on personal attention to each guest's needs—down to the rubber duck in every tub.

**The Boston Marriott Copley Place** has a glass-enclosed walkway to the Hynes, and has direct access to the Copley Place shopping complex. A full-service hotel very convenient to all modes of transportation.

Located adjacent to the Boston Common and Public Gardens, the **Boston Park Plaza** maintains the luxury and splendor that has attracted heads of state, famous stars and anyone who cherishes the era of grand American hotels.

**The Copley Plaza Hotel,** a landmark since 1912, has undergone a $20 million restoration. Now restored to its original grandeur, with full concierge services, health club, and period antique reproductions.

Each room at the **57 Park Plaza Hotel,** located adjacent to the Public Garden and theater district, has a private balcony overlooking the heart of Boston. The hotel has an enclosed pool with sundeck and saunas, and offers its guests free parking.

Convenient to Cambridge, every room is a suite at the **Guest Quarters Suite Hotel.** This spacious alternative to traditional hotels has all the amenities you will want, and a first-class jazz cabaret too.

The best view of Boston's skyline is from the **Hyatt Regency Cambridge.** Across the river, this is a great choice for those with meetings at MIT, Harvard or Boston University. Special Camp Hyatt program for children is available with activities and babysitting.

*Headquarters Hotel

SCIENCE INNOVATION

# Advance Registration Form

**Science Innovation '93**
**Hynes Convention Center — Boston**
**6-10 August 1993**

**DEADLINE: 16 JULY**

## REGISTRANT INFORMATION (Please type or print legibly)

First Name (as you would like it to appear on your badge)

Family Name (as you would like it to appear on your badge)

Institution/Company (will appear on badge, subject to abbreviation)

Mailing Address

City

State

Zip Code

Country

Daytime Phone Number

Fax Number

**AAAS membership number (if member) _____**
**(appears on AAAS membership card and above your name on Science subscription label)**

## SPECIAL HOUSING NEEDS

☐ Check here if you need special services due to a disability (we'll call you).

## CONCURRENT DISCUSSION

Please indicate the three sessions you're most interested in attending (check three):

- ☐ DNA Amplification
- ☐ Gene Sequencing Tools
- ☐ Fluorescent In Situ Hybridization and Nonisotopic Detection
- ☐ Screening
- ☐ Peptides and Combinatorial Libraries
- ☐ NMR Determination of Protein Structure
- ☐ Antibody Catalysis
- ☐ Non-invasive Diagnostics
- ☐ Imaging
- ☐ DNA Diagnostics
- ☐ Oligonucleotide Synthesis and Antisense Pharmaceuticals
- ☐ Drug Design
- ☐ Drug Targeting and Liposomes
- ☐ Clinical Immunology, Immunosuppression and Vaccines
- ☐ Growth Factors/ Cytokines/Receptors
- ☐ Tumor Immunogenicity and Markers
- ☐ Blood Substitutes
- ☐ AIDS Research and Animal Models
- ☐ Chemical Communication
- ☐ Plant Development
- ☐ New Microscopy
- ☐ Sensors
- ☐ Robotics and Neural Networks
- ☐ Carbohydrate Structure Anaylsis
- ☐ Gene Transfer

## MEETING FEES

**Registration fees[1] (Check one box only)**

| Category | *Advance by 16 July '93* | *On Site* |
|---|---|---|
| ☐ Regular AAAS member | $295 | $395 |
| ☐ Regular nonmember | $395 | $495 |
| ☐ Student[2]/Postdoc AAAS member | $125 | $200 |
| ☐ Student[2]/Postdoc nonmember | $175 | $250 |

☐ If registering at the student rate, check here and attach a copy of your student ID card.

**Luncheon Fees (Check all that apply)**

| | |
|---|---|
| ☐ Lunch, Saturday 7 August | $21 |
| ☐ Lunch, Sunday 8 August | $21 |
| ☐ Lunch, Monday 9 August | $21 |
| ☐ Lunch, Tuesday 10 August | $21 |

**Membership Dues[3] (Optional)**

If you're not a AAAS member, you can join now by checking the appropriate box below—and take advantage of discounted *member* registration fees. You'll also get a year's subscription (51 weekly issues) to the journal SCIENCE[3].

| | USA | Canada | International |
|---|---|---|---|
| ☐ Regular | $87 | $146.59 US | $182 US |
| ☐ Student | $47 | $103.79 US | $142 US |
| ☐ Postdoctoral | $62 | $119.84 US | $157 US |
| ☐ Retired | $47 | $103.79 US | $142 US |

## PAYMENT

Meeting registration fee[4] .....$ _____

Luncheon fee total .....$ _____

Membership dues (if joining now).....$ _____

Total amount.....$ _____

☐ Check enclosed[5] ☐ VISA ☐ MasterCard
*(no other credit cards accepted)*

☐ Original institutional purchase order attached

Credit card number

Expiration date Signature

## MAILING INSTRUCTIONS (16 JULY DEADLINE[1])

Mail to: Science Innovation '93, P.O. Box 630285, Baltimore, MD 21263. Or fax (credit card payments only) to 202-289-4021.
If you have any questions, call 202-326-6450.

AS3HS

## IMPORTANT FOOTNOTES

[1] Deadline for advance registration is 16 July! Registrations received after this date will not be processed, however, you may register on site at the Hynes Convention Center beginning at noon on 6 August. One-day registration is available on site only at the following rates: Regular member-$195, regular nonmember-$245, student member-$95, student nonmember-$125.

[2] To qualify for student rate, you must be a graduate or undergraduate student and must attach a copy of your student ID card. Registrations received without appropriate verification will be charged at the Regular rates.

[3] Membership: $47 of dues plus international postage fees are allocated to *Science*. Canadian dues include GST. Please allow 6-8 weeks for receipt of first issue of *Science*.

[4] Cancellations must be received in writing by 23 July 1993. No refunds will be made for cancellations received after this date. Refunds are subject to a $50 cancellation charge. No refunds will be processed until after the meeting.

[5] Checks must be in United States currency and must be payable on a U.S. bank. Please make checks payable to Science Innovation '93.

# Hotel Reservation Form

**SEND CONFIRMATION TO** (please type or print legibly) **DEADLINE: 9 JULY**

First/Given Name _____ Last/Family Name _____

Institution/Company (if part of address) _____

Address _____

City _____ State _____ Zip _____ Country _____

Phone _____ Fax _____

Names of All Room Occupant(s) (name) _____ (name) _____

(name) _____ (name) _____

**Hotel Choice** **Hotel Name**

*1st* _____

*2nd* _____

*3rd* _____

*4th* _____

**Most important (check one):**

☐ *proximity to the meeting site* ☐ *comparable room rate*

**Type of room desired (check one):**

☐ *Single (1 person, 1 bed)* ☐ *Double (2 people, 1 bed)* ☐ *Double/Double (2 people, 2 beds)*

☐ *Triple (3 people, 2 beds)* ☐ *Quadruple (4 people, 2 beds)* ☐ *1-bedroom suite* ☐ *2-bedroom suite*

ARRIVAL DATE _____ TIME _____ DEPARTURE DATE _____ TIME _____

**Special housing needs:**

☐ *Wheelchair-accessible room* ☐ *Nonsmoking room*

☐ *Other* _____

**All reservations must be guaranteed with a deposit or credit card at least 14 days prior to arrival.**

☐ *VISA* ☐ *MasterCard*

Credit Card # _____

Exp. Date _____ Card User Name (please print) _____

Signature _____

If you do not wish to use a credit card guarantee, a deposit check for the first and last night's stay will be required by the assigned hotel at least 14 days prior to arrival. **Deposit checks should not be sent to the housing bureau; if received they will be returned.** The check should be sent directly to the hotel where you have been assigned after you receive the hotel confirmation. If credit card information is not provided or if a deposit check is not received at least 14 days prior to arrival, the hotels reserve the right to release your reservation.

## MAILING INSTRUCTIONS (9 JULY DEADLINE)

Send your completed form via mail or fax (not both) to:

**Science Innovation '93, AAAS Housing Bureau, Prudential Tower, Suite 400, P.O. Box 490, Boston, MA 02199**
**FAX 617-536-0813**

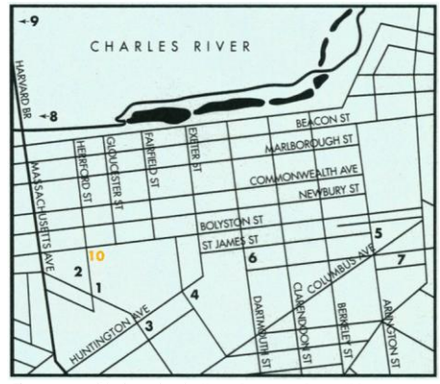
Reservation forms must be received by 9 July 1993. Housing requests received after 9 July 1993 are conditional on room availability. Do not mail this form to AAAS; see the mailing address above. It is recommended that you keep a photocopy of this form for your records.

## Science Innovation '93
## Hynes Convention Center — Boston
## 6-10 August 1993

### HOTEL ROOM RATES

| | *Hotel Name* | *Single* | *Double* | *Extra Person* |
|---|---|---|---|---|
| 1 | Sheraton Boston* | $121 | $133 | $20 |
| 2 | Back Bay Hilton | 113 | 113 | 20 |
| 3 | Colonnade Hotel | 103 | 103 | — |
| 4 | Marriott Copley Place | 145 | 165 | 20 |
| 5 | Boston Park Plaza | 125 | 135 | 20 |
| 6 | Copley Plaza | 125 | 145 | 20 |
| 7 | 57 Park Plaza | 100 | 110 | 15 |
| 8 | Guest Quarters Suites† | 110 | 120 | 20 |
| 9 | Hyatt Regency Cambridge† | 110 | 120 | 25 |

*Headquarters Hotel
† not shown on map
see page 9 for Hotel Descriptions




**The meeting will be located at the Hynes Convention Center #10 on map.**

### RESERVATIONS

The AAAS Housing Bureau will make hotel reservations on a first-come, first served basis upon receipt of a properly completed Science Innovation '93 housing form. Reservations will be processed in order of receipt, based on choice and availability. Acknowledgments will be sent directly to the occupant by the Housing Bureau and will be followed by a confirmation from the assigned hotel. Telephone reservations cannot be accepted. To complete this form:

[1] Use a separate reservation form for each room requested, not for each individual. Send only one form if sharing with a colleague; duplicate forms cause delays in processing and may result in double charges.

[2] List at least four hotels, in order of preference, where you'd like to stay. Check whether rate or proximity is most important to you.

[3] Check the type of room you would like.

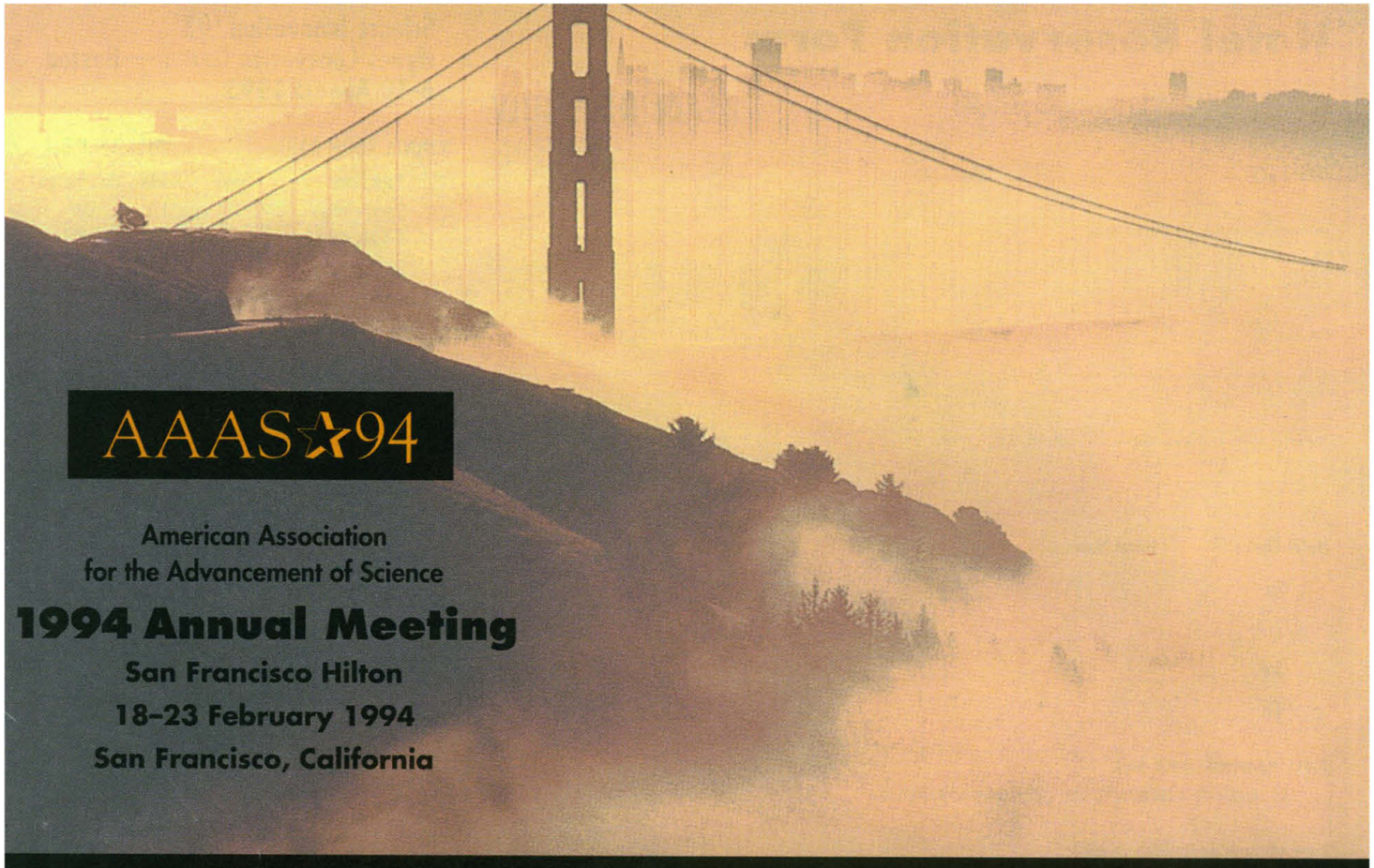
[4] Complete the remainder of the form, being sure to include your arrival and departure dates, credit card number and expiration date (if using credit card for your deposit), and any special requests you might have (nonsmoking room, wheelchair accessibility, etc.).

[5] Please be thorough; failure to include all pertinent information may delay processing of your reservation.

[6] Children: there is usually no charge for children under a particular age; check with the hotel to which you are assigned.

### CANCELLATIONS/CHANGES

To cancel or make changes to reservations, contact the Housing Bureau at 617-536-9028 until 9 July. After that, please contact the hotel directly. No refunds will be given for cancellations made less than 72 hours prior to the opening of the conference.



AAAS ★ 94

American Association
for the Advancement of Science

# 1994 Annual Meeting

San Francisco Hilton
18–23 February 1994
San Francisco, California

**Plan ahead—Mark your calendar with these future meeting dates...**

For more information contact the AAAS Meetings Office ★ Phone: 202-326-6450 ★ Fax: 202-289-4021

SCIENCE
INNOVATION

American Association
for the Advancement of Science

# Science Innovation '94

Oregon Convention Center
25-29 July 1994
Portland, Oregon