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25 January 1991 $6.00
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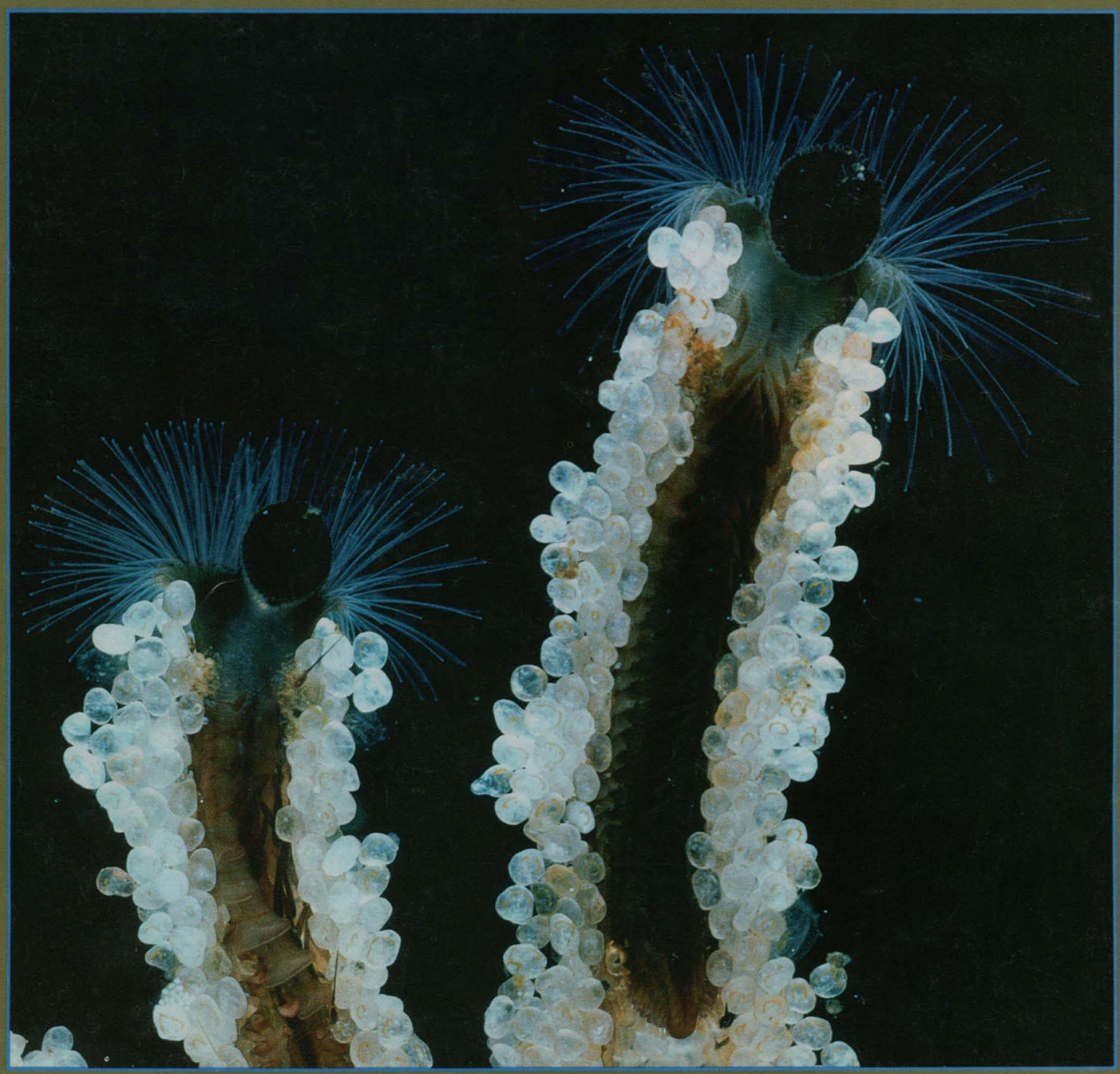

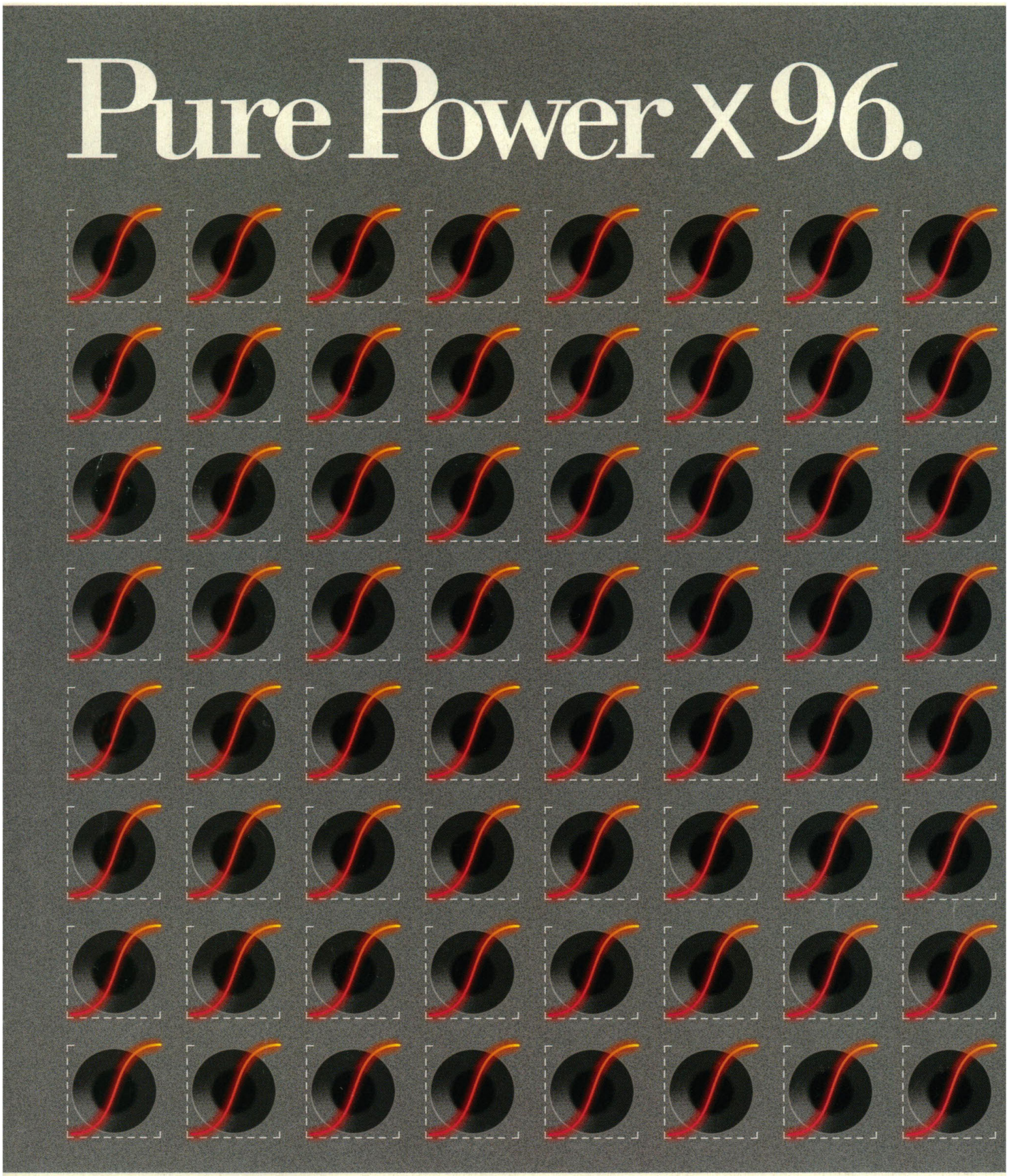
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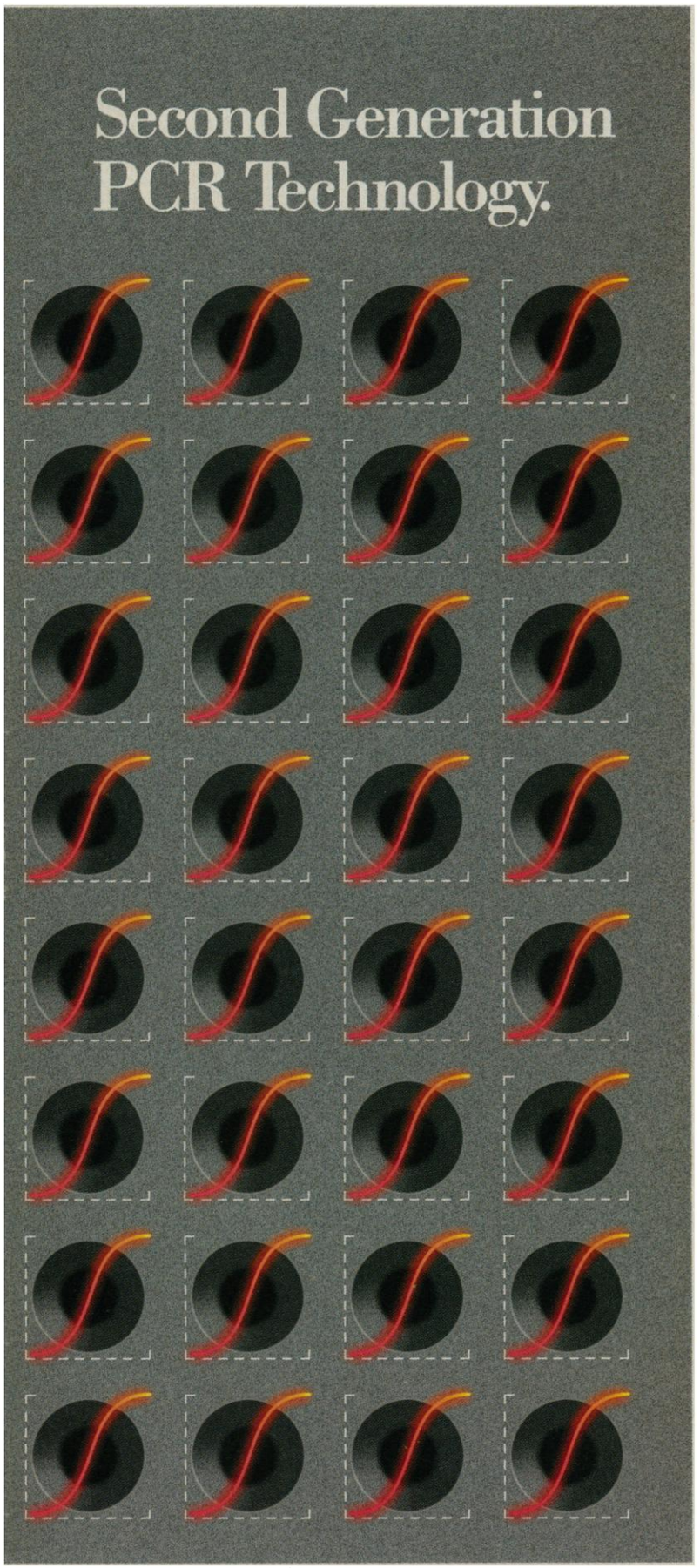

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SCIENCE

ISSN 0036-8075
25 JANUARY 1991
VOLUME 251
NUMBER 4992

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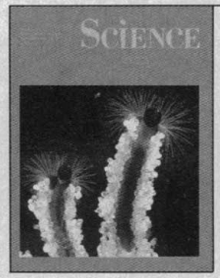

COVER Adult reef-building marine polychaetes (*Phragmatopoma lapidosa californica*) that have built sand tubes against a pane of glass. Planktonic larvae of these worms settle when they contact adult tube sand, a response that is facilitated by chemical and hydrodynamic processes. See page 421. [Photograph by Joseph R. Pawlik, University of North Carolina at Wilmington]

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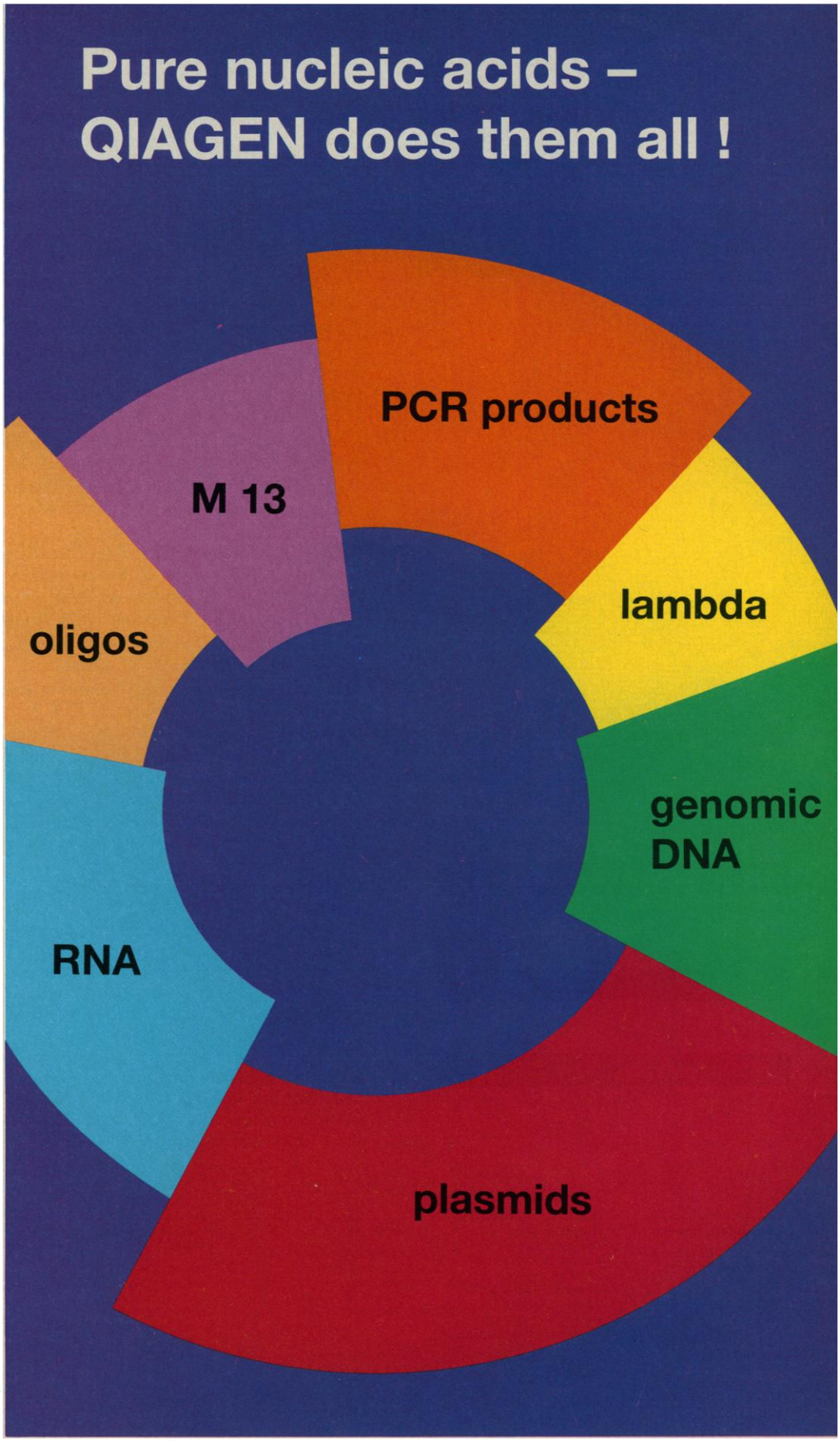

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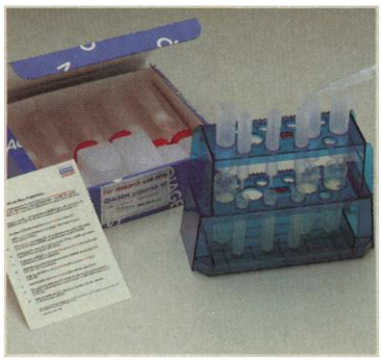

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This Week in
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Thermodynamics of surface morphology

WHAT happens to the atoms at the surface of a solid when the surface is heated or when impurities are introduced into the surface layer (page 393)? The thermodynamic behavior of atoms at the surface as they try to attain a new equilibrium has been described in terms of steps—linear boundaries across which the surface height changes by one or more atomic layers. These steps wander on the surface, repel other steps as they approach each other, coalesce to form facets, or interact in other ways; it is such interactions that determine the free energy at the surface. Statistical mechanical models for the behavior of steps and direct observations of them and their behavior by imaging and diffraction techniques are reviewed by Williams and Bartelt. A clear understanding of the movements of atoms on solid surfaces is needed for improving technologies that rely on interactions at interfaces, such as crystal growth and the preparation of electronic chips.

Larval recruitment

TUBE worms, *Phragmatopoma lapidosa californica* (cover), live in the eastern Pacific where they build massive reefs. These organisms, which are suspension feeders, depend on currents to bring in food; the currents also supply them with sand grains that are used for building tubes. Laboratory flume experiments in which the flow conditions of one of the natural habitats of these worms, shallow subtidal environments, were simulated indicate that both physical factors and chemicals associated with tube sand have an influence on where larvae will settle to metamorphose to juveniles (page 421). Under rapid enough current conditions, larvae swim to the bottom and then bounce along the bed until they encounter the right chemical inducers for metamorphosis. In slower moving waters, the larvae remain suspended or swim around in the water column, and fewer reach the bed. Pawlik *et al.* suggest that the ability of these larvae to sense and respond to rapid flow conditions may be vital to their survival on the reef, because without strong currents food and sand would not become available to them. The chemical signals that induce metamorphosis include the free fatty acid palmitoleic acid and a cement that the worms use to build their tubes.

Pacemaker cells

RECORDINGS from the brain indicate that neurons in the cortex have a variety of rhythmic and nonrhythmic firing patterns. Specific patterns are associated with sleep, wakefulness, coma, epilepsy, and other behavioral and neuropathologic states, and there is speculation that some patterns are important in consciousness. A pacemaker role in the firing process has been identified for pyramidal cells in layer 5 of the cortex (page 432); these cells have a regular synchronized firing pattern of their own and they coordinate and regulate the rhythmic firing of neurons elsewhere in the brain. Silva *et al.* found that the layer 5 cells are both necessary and sufficient for the sustained rhythmic firing of other cortical cells: when they were disconnected from the rest, the pyramidal cells continued to fire at their standard rate but cells elsewhere in the cortex stopped firing. In individual neurons, both sodium and calcium currents were required to support the oscillations. The coordination of rhythmic neuronal firing in the cortex was dependent on activation of NMDA receptors, which respond to endogenous glutamate.

Substance P antagonist

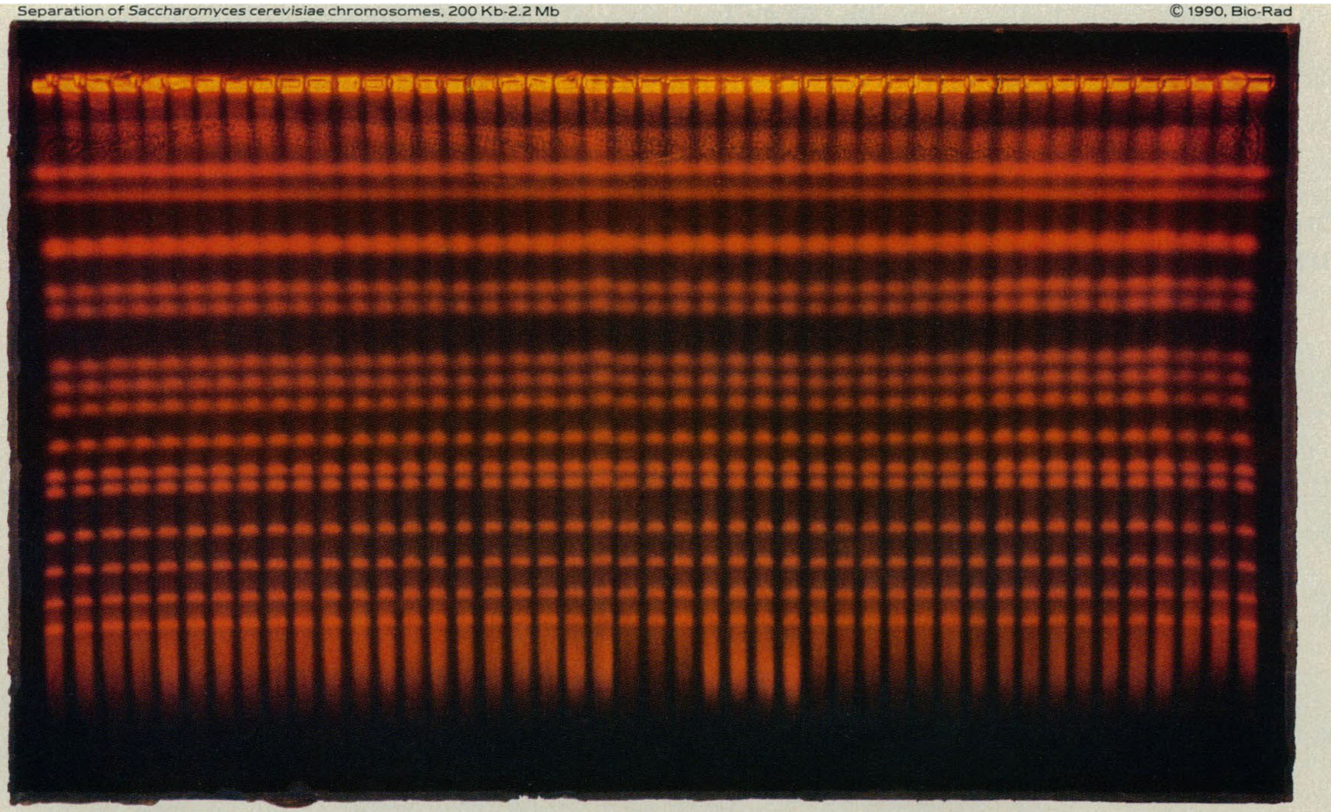
COMPANION papers by Snider, McLean, and colleagues describe the properties of CP-96,345, a specific and potent antagonist of substance P (pages 435 and 437). Substance P is a member of the tachykinin family of peptides; these peptides are distributed throughout the body and function as neurotransmitters, vasodilaters, activators of cells of the immune system, contractors of smooth muscle, and stimulators of the secretion of saliva. Agonists of substance P have been known, but this is the first nonpeptide antagonist that has become available. CP-96,345 binds selectively and competitively to the receptor for substance P in the brain, NK_1. It blocks the ability of substance P to induce salivation in anesthetized rats. The availability of such a compound is a boon to both laboratory and clinical studies for analyzing the effects of substance P, for sorting its effects from those of other tachykinins, and possibly for therapy in a range of disorders.

Kinetic partitioning

MOLECULAR chaperones are proteins that help other proteins interact. They facilitate such processes as the assembly of oligomers from monomeric subunits, the localization of proteins to specific sites in cells, and the secretion of proteins from cells. The chaperone from *Escherichia coli* SecB is involved in the secretion of a number of unrelated protein molecules, and it does not recognize a specific amino acid sequence in these ligands. Hardy and Randall found that the common feature of the proteins that bound SecB was that they had not yet folded into their native conformations (page 439). They propose that the selectivity of SecB reflects kinetic partitioning between the rate at which a protein folds and the rate at which it can associate with a chaperone molecule. The binding site for SecB—possibly a region of hydrophobicity or one that could form hydrogen bonds—would be increasingly masked as folding proceeds. The selectivity of SecB for secreted proteins may result because proteins destined for export, which generally have a leader sequence, tend to fold more slowly than those without a leader. Such proteins would be more available to bind SecB than would faster folding intracellular proteins.

■ RUTH LEVY GUYER

Separation of *Saccharomyces cerevisiae* chromosomes, 200 Kb-2.2 Mb



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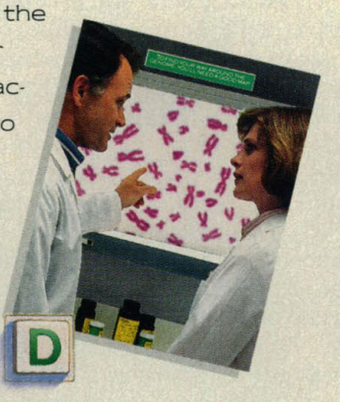

1. D. C. Schwartz and C. R. Cantor. *Cell*, **37**, 67 (1984).
2. Programmed Autonomously Controlled Electrodes. See S. M. Clark, E. Lai, and L. Hood. *Science*, **241**, 1203 (1988).

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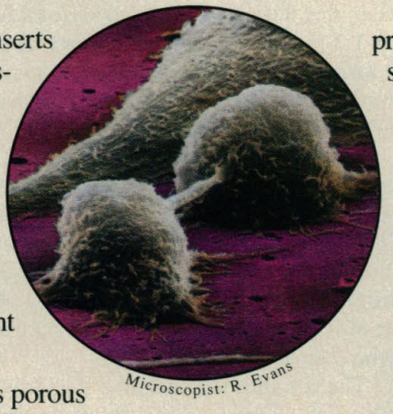

Microscopist: R. Evans

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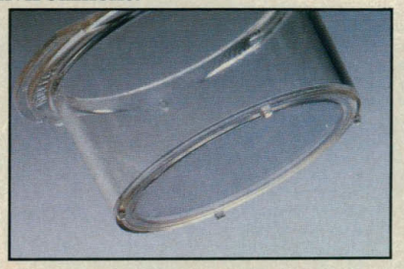

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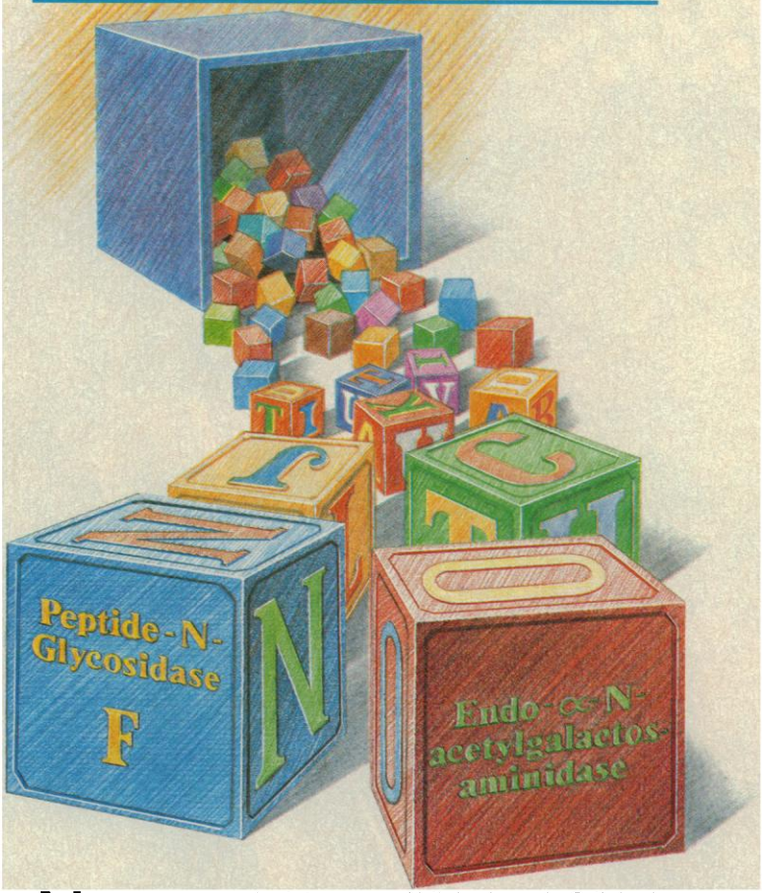

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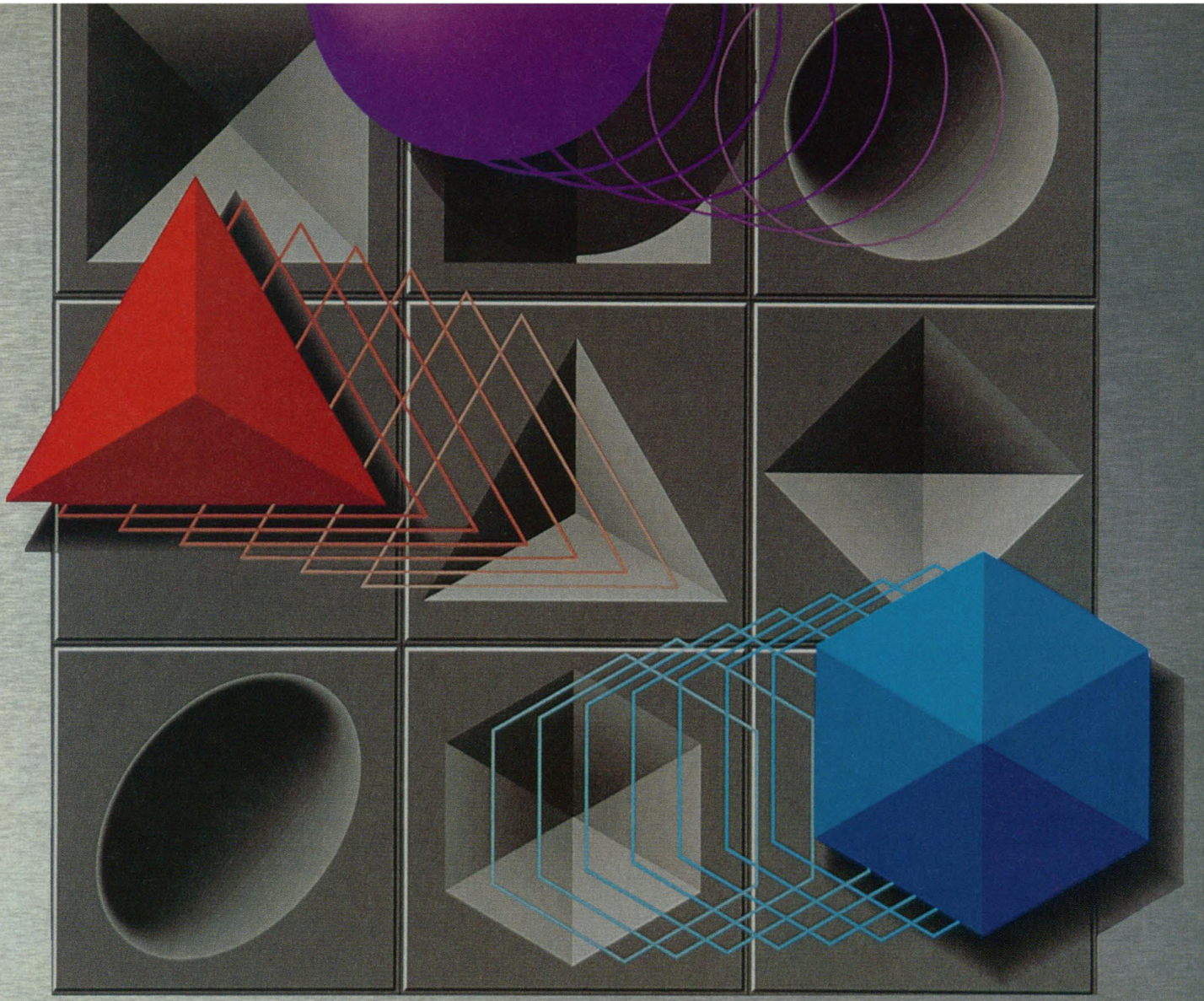

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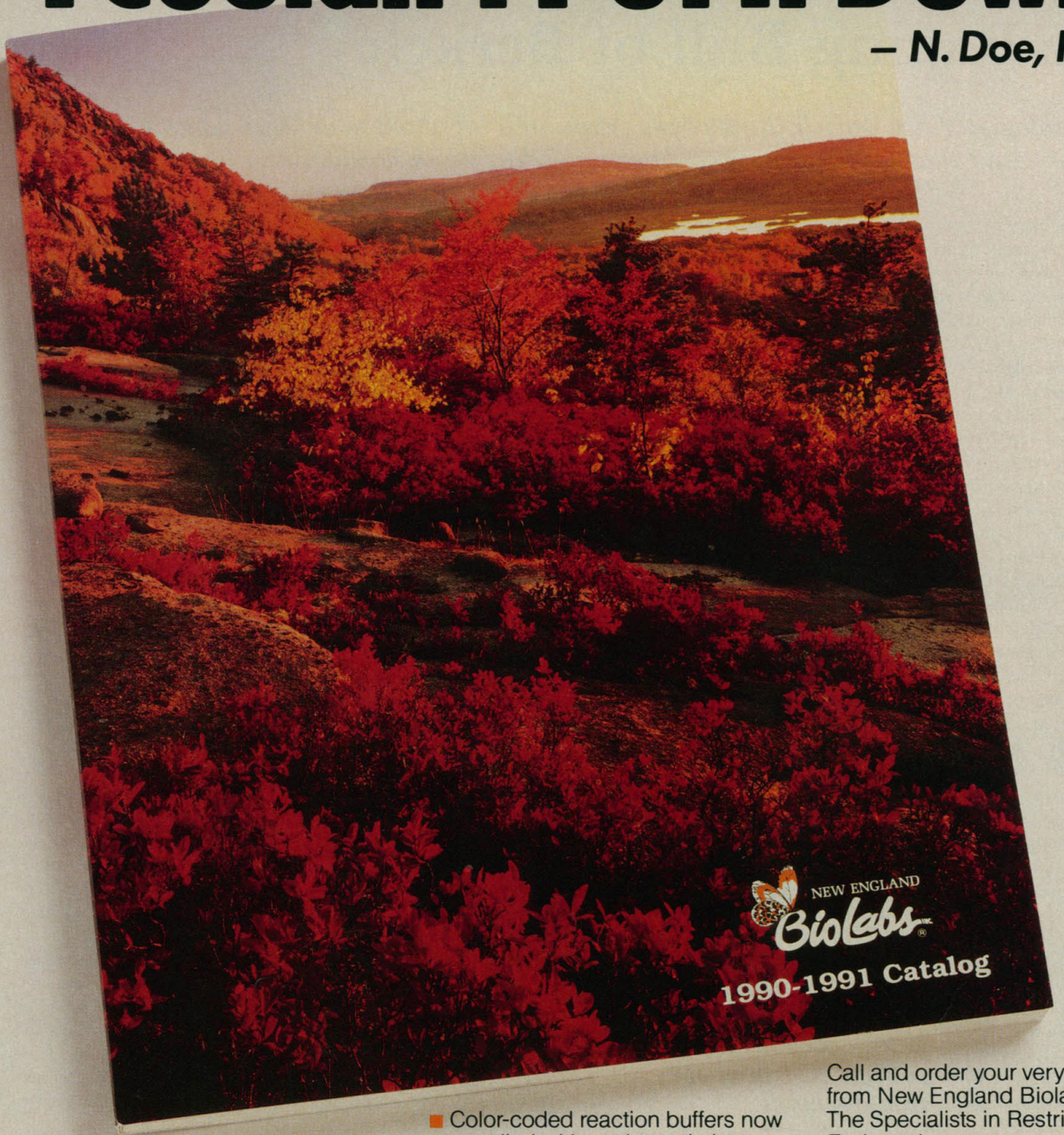

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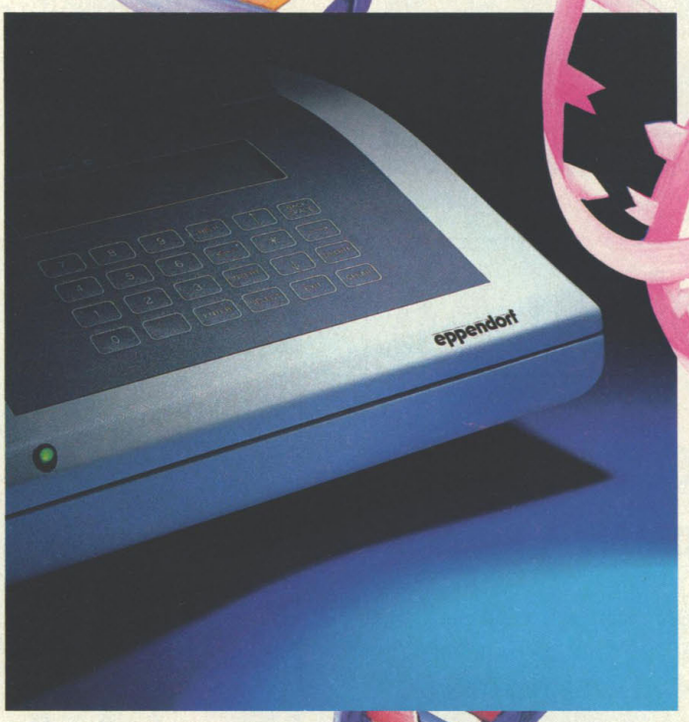

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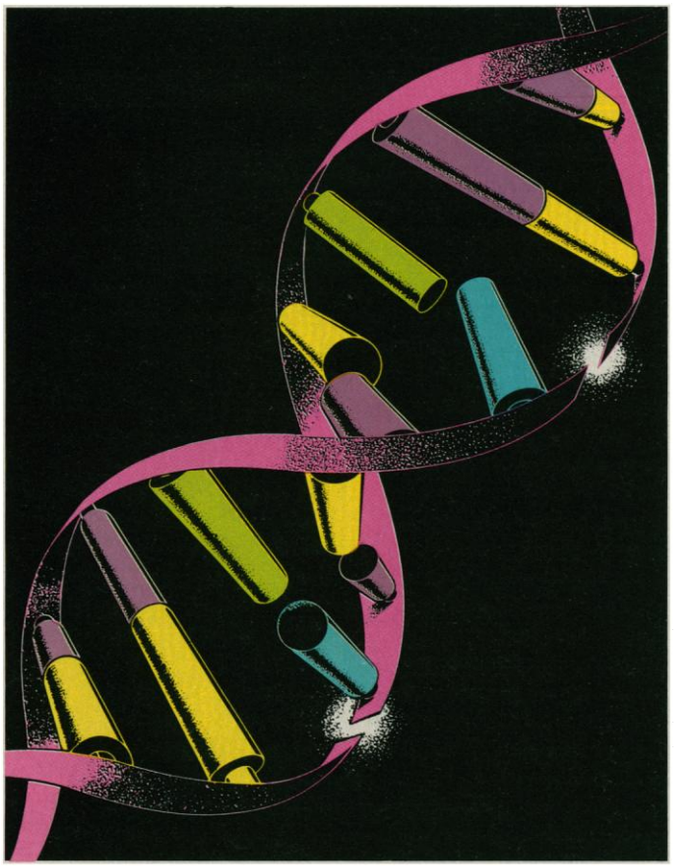

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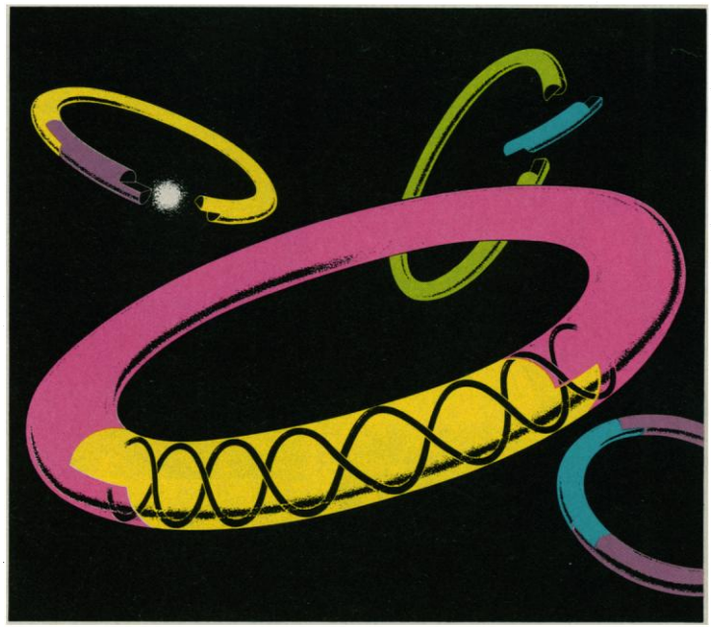

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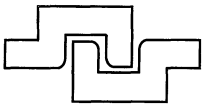
NATO International Scientific Exchange Programmes



Applications are invited for support under the programmes of the NATO Science Committee

Advanced Study Institutes

ASIs are tutorial courses of two weeks' duration on new important topics for up to 100 scientists and research students. They aim at the dissemination of advanced scientific knowledge and the promotion of international contacts among scientists.

Advanced Research Workshops

ARWs are working meetings which enable scientists and engineers to review the state-of-the-art in specific topics in fast moving fields and to formulate recommendations for the future. They are of about five days' duration.

Collaborative Research Grants

CRGs are aimed at encouraging cooperation between researchers in different nations of the Alliance seeking solutions to common problems. The proposed research must be specific and carried out jointly by researchers in at least two member countries. Short reciprocal visits are funded.

Those wishing to organize and direct an ASI or an ARW, or participate in collaborative research should write for information and application forms to :

Scientific Affairs Division (Ref. 1991-1), NATO, B-1110 Brussels, Belgium

1991

Programme of meetings

The Advanced Study Institutes and Advanced Research Workshops to be held in 1991 are given in the following pages. **Each meeting is held under the responsibility of its director, to whom all requests for information, attendance or support should be addressed.** Participation or tuition fees are not required from participants, some of whom may obtain small grants from the meeting director to assist with travel and living expenses. Attendance at ASIs is open to all suitably-qualified applicants. Attendance at ARWs is usually by invitation only, but a few places are available for particularly well-qualified scientists upon application to the director.

Locations and dates noted in this list may change. Many meetings are of an interdisciplinary nature - please check all subject areas.

In addition to the general Advanced Study Institutes and Advanced Research Workshops Programmes, NATO supports these types of meeting as part of a special effort in Advanced Educational Technology (AET), Chaos, Order and Patterns : Aspects of Non-Linearity (COP) and Science of Global Environmental Change (SGEC).

PUBLICATION - The papers and discussions are published in the NATO ASI Series by :
Plenum - Kluwer - Springer Verlag

LIFE SCIENCES

BIOLOGICAL EFFECTS AND PHYSICS OF SOLAR AND GALACTIC COSMIC RADIATION
Dr. PD McCORMACK, NASA HQ, LIFE SCIENCES DIVISION (CODE EBM), WASHINGTON, DC 20546, USA
1-10 April 1991 CESME, IZMIR, TURKEY **890648**

RHYTHMS IN FISHES
Prof. MA ALI, UNIVERSITE DE MONTREAL, DEP. DE BIOLOGIE, C.P. 6128, SUCC. A,MONTREAL, QUEBEC, CANADA H3C 3J7
4-17 August 1991 MONTREAL, QUEBEC, CANADA **891043**

ASTHMA TREATMENT: A MULTIDISCIPLINARY APPROACH
Prof. D OLIVIERI, UNIVERSITY OF PARMA, DEPT. OF RESPIRATORY DISEASES, RASORI HOSPITAL, SCHOOL OF MEDICINE, 43100 PARMA, ITALY
19-29 May 1991 ERICE, SICILY, ITALY **900321**

DYNAMICS OF MEMBRANE ASSEMBLY
Dr. JAF OP DEN KAMP, UNIVERSITY OF UTRECHT, CTR FOR BIOMEMBRANES & LIPID ENZYMOLOGY, PADUALAAN 8, 3584 CH UTRECHT, THE NETHERLANDS
17-29 June 1991 CARGESE, CORSICA, FRANCE **900337**

PHOTOPROCESSES IN TRANSITION METAL COMPLEXES, BIOSYSTEMS AND OTHER MOLECULES; EXPERIMENT AND THEORY
Dr. E KOCHANSKI, UNIVERSITE LOUIS PASTEUR, UPR139DU CNRS, LAB.DE CHIMIE THEORIQUE, BP 196, 67008 STRASBOURG, FRANCE
1-13 September 1991 AUSSOIS, FRANCE **900403**

ANGIOGENESIS IN HEALTH AND DISEASES
Prof. ME MARAGOUDAKIS, UNIVERSITY OF PATRAS, MEDICAL SCHOOL, DEPT. OF PHARMACOLOGY, PATRAS 265 00, GREECE
16-27 June 1991 PORTO HYDRA, GREECE **900747**

THE CHANGING VISUAL SYSTEM: FROM EARLY TO LATE STAGES OF LIFE
Prof. P BAGNOLI, UNIVERSITY OF PISA, DEPT. OF PHY... & BIOCHEMISTRY, VIA S. ZENO 31, 56127 PISA, ITALY
26 May-6 June 1991 VITERBO, ITALY **900752**

GENETIC CONSERVATION OF SALMONID FISHES
Prof. JG CLOUD, UNIVERSITY OF IDAHO, DEPT. OF BIOLOGICAL SCIENCES, MOSCOW, IDAHO 83843, USA
23 June-5 July 1991 MOSCOW, IDAHO, USA **900754**

TARGETING OF DRUGS: THE CHALLENGE OF PEPTIDES AND PROTEINS
Dr. G GREGORIADIS, UNIVERSITY OF LONDON, CENTRE FOR DRUG DELIVERY RESEARCH, THE SCHOOL OF PHARMACY, 29-39 BRUNSWICK SQUARE, LONDON WC1N 1AX, UK
24 June-5 July 1991 CAPE SOUNION, GREECE **900782**

RISK AND RELIABILITY IN WATER RESOURCES AND ENVIRONMENTAL ENGINEERING
Prof. J GANOULIS, ARISTOTLE UNIVERSITY OF THESSALONIKI, DEPARTMENT OF CIVIL ENGINEERING, 54006 THESSALONIKI, GREECE
18-28 May 1991 PORTO CARRAS, GREECE **900805**

T LYMPHOCYTES : STRUCTURE, FUNCTION, CHOICES
Prof. F CELADA, UNIV. OF GENOA, DEPT. OF IMMUNOLOGY, VIALE BENEDETTO XV, 10, 16132 GENOA, ITALY,
16-26 September 1991 PORTO CONTE, SASSARI, ITALY **900851**

DEVELOPMENT OF THE CENTRAL NERVOUS SYSTEM IN VERTEBRATES
Prof. SC SHARMA, NEW YORK MEDICAL COLLEGE, DEPT. OF OPTHALMOLOGY, VALHALLA, N.Y. 10595, USA
16-28 June 1991 MARATEA, ITALY **900860**

CHEMICAL REACTOR TECHNOLOGY FOR ENVIRONMENTALLY SAFE REACTORS AND PRODUCTS
Prof. HI DE LASA, UNIV.OF WESTERN ONTARIO, CHEMICAL REACTOR ENGINEERING CENTRE, FACULTY OF ENGINEERING SCIENCE, LONDON, ONTARIO, CANADA N6A 5B9
25 August-5 Sept. 1991 LONDON,ONT.,CANADA **900882**

NERVE-MUSCLE FUNCTION : BIOELECTROCHEMISTRY, MECHANISM, ENERGETICS AND CONTROL
Prof. G MILAZZO, UNIVERSITY OF ROME, PIAZZA G. VERDI 9, 00198 ROMA, ITALY
20 October-1 November 1991 ERICE, SICILY, ITALY **900916**

NEW FRONTIERS IN CARDIOVASCULAR ENGINEERING
Prof. NHC HWANG, MEMPHIS STATE UNIVERSITY, DEPT. OF BIOMEDICAL ENGINEERING, MEMPHIS, TN 38512, USA
10-21 May 1991 OLIVE BRANCH, MISSISSIPPI, USA **900937**

ADVANCEMENTS AND APPLICATIONS OF MECHATRONICS DESIGN IN TEXTILE ENGINEERING
Dr. M ACAR, LOUGHBOROUGH UNIVERSITY OF TECHNOLOGY, DEPARTMENT OF MECHANICAL ENGINEERING, LOUGHBOROUGH, LEICS LE11 3TU, UK
28 July-10 August 1991 BURSA, TURKEY **900951**

METHODOLOGY FOR GENETIC STUDIES OF TWINS AND FAMILIES
Prof. R VLIETINCK, UNIVERSITY HOSPITAL GASTHUISBERG, CENTRE OF HUMAN GENETICS,HERESTRAAT 49, B-3000 LEUVEN, BELGIUM
15-28 September 1991 LEUVEN, BELGIUM **901115**

PHYSICS AND CHEMISTRY

STRUCTURE AND DYNAMICS OF SUPRAMOLECULAR AGGREGATES AND STRONGLY INTERACTING COLLOIDS
Prof. SH CHEN, MASSACHUSETTS INSTITUTE OF TECHNOLOGY, DEPT.OF NUCLEAR ENGINEERING,24-211, CAMBRIDGE, MA 02139, USA
1-10 June 1991 IL CIOCCO, ITALY **891047**

OPTICAL PROPERTIES OF EXCITED STATES IN SOLIDS
Prof. B DI BARTOLO, BOSTON COLLEGE, DEPT. OF PHYSICS, CHESTNUT HILL, MA 02167, USA
16-30 June 1991 ERICE, SICILY, ITALY **900341**

COMPUTER SIMULATION IN MATERIALS SCIENCE: INTERATOMIC POTENTIALS,TECHNIQUES & APPLICATIONS
Dr. M MEYER, CNRS, LAB. DE PHYSIQUE DES MATERIAUX, 1 PLACE A. BRIAND, 92195 MEUDON CEDEX, FRANCE
24 March-5 April 1991 AUSSOIS, FRANCE **900384**

PHYSICS OF NANOSTRUCTURES
Dr. AR LONG, UNIVERSITY OF GLASGOW, DEPT. OF PHYSICS & ASTRONOMY, GLASGOW G12 8QQ, UK
29 July-9 August 1991 ST. ANDREWS, SCOTLAND. **900388**

STRONGLY INTERACTING FERMIONS AND HIGH TC SUPERCONDUCTIVITY
Dr. R RAMMAL, CENTRE NATIONAL DE LA RECHERCHE SCIENTIFIQUE, BP 166X, F-38042 GRENOBLE CEDEX, FRANCE
30 July-31 August 1991 LES HOUCHES, FRANCE **900408**

GUIDED WAVE NON-LINEAR OPTICS
Prof. DB OSTROWSKY, UNIV. DE NICE, LAB. DE PHYSIQUE DE LA MATIERE CONDENSEE, PARC VALROSE, F-06034 NICE CEDEX, FRANCE
12-23 August 1991 CARGESE, CORSICA, FRANCE **900504**

SPONTANEOUS FORMATION OF SPACE-TIME STRUCTURES AND CRITICALITY
Prof. T RISTE, INSTITUTT FOR ENERGITEKNIKK, P.O. BOX 40, N-2007 KJELLER, NORWAY,
2-12 April 1991 GEILO, NORWAY **900717**

CHEMISTRY AND CHEMICAL ENGINEERING OF CATALYTIC SOLID FUEL CONVERSION FOR THE PRODUCTION OF CLEAN SYNTHETIC FUELS
Prof. Y YURUM, HACETTEPE UNIVERSITY, DEPT. OF CHEMISTRY, BEYTEPE, 06532 ANKARA, TURKEY
21 July-3 August 1991 AKCAY BALIKESIR, TURKEY **900718**

METAL-LIGAND INTERACTIONS-FROM ATOMS,TO CLUSTERS, TO SURFACES
Prof. SALAHUB, UNIVERSITY OF MONTREAL,DEPT.OF CHEMISTRY, C.P.6128,SUCC.A,MONTREAL,QUEBEC,CANADA H3C 3J7
10-21 June 1991 CETRARO, ITALY **900744**

BLACK HOLE PHYSICS
Prof. V DE SABBATA, UNIVERSITA DI BOLOGNA, DIPTO. DI FISICA, VIA IRNERIO 46, 40126 BOLOGNA, ITALY
12-22 May 1991 ERICE, SICILY, ITALY **900749**

PARTICLES IN THE NINETIES
Prof. J ILIOPOULOS, ECOLE NORMALE SUPERIEURE, LAB.DE PHYSIQUE THEORIQUE, 24 RUE LHOMOND, 75231 PARIS CEDEX 05, FRANCE
30 June-26 July 1991 LES HOUCHES, FRANCE **900750**

SINGLE CHARGE TUNNELING
Prof. H GRABERT, UNIVERSITAT GHS ESSEN, FACHBEREICH PHYSIK, D-4300 ESSEN 1,GERMANY
5 March-15 March 1991 LES HOUCHES, FRANCE **900753**

THEORETICAL ADVANCEMENT IN CHROMATOGRAPHY AND RELATED SEPARATION TECHNIQUES
Prof. F DONDI, UNIVERSITA DI FERRARA, DEPT. OF CHEMISTRY, VIA L.BORSARI 46, 44100 FERRARA, ITALY
25 May-5 June 1991 FERRARA, ITALY **900830**

NEW SYMMETRY PRINCIPLES IN QUANTUM FIELD THEORY
Prof. G MACK, UNIVERSITY OF HAMBURG, II. INSTITUT FUR THEORETISCHE PHYSIK, LURUPER CHAUSSEE 149, D-2000 HAMBURG 50, GERMANY
16-27 July 1991 CARGESE, CORSICA, FRANCE **900832**

MOLECULAR LIQUIDS: NEW PERSPECTIVES IN PHYSICS AND CHEMISTRY
Prof. JJC TEIXEIRA-DIAS, UNIVERSITY OF COIMBRA, CHEMICAL DEPARTMENT, P-3049 COIMBRA, PORTUGAL
15-26 Sept. 1991 FIGUEIRA-DA-FOZ, PORTUGAL **900837**

PHASE TRANSITIONS IN LIQUID CRYSTALS
Prof. S MARTELLUCCI, THE SECOND UNIVERSITY OF ROME,MECH. ENGINEERING DEPT,VIA ORAZIO RAIMONDO,I-00173 ROME,ITALY
2-12 May 1991 ERICE, SICILY, ITALY **900890**

ENERGETICS OF ORGANOMETALLIC SPECIES
Dr. JA MARTINHO SIMOES, INSTITUTO SUPERIOR TECNICO, DEPTO. DE ENGENHARIA QUIMICA, 1096 LISBOA CODEX, PORTUGAL
27 August-6 Sept. 1991 CARVOEIRO, PORTUGAL **900902**

METHODS IN COMPUTATIONAL MOLECULAR PHYSICS
Dr. S WILSON, SCIENCE AND ENGINEERING RESEARCH COUNCIL, RUTHERFORD APPLETON LABORATORY, CHILTON, OXFORDSHIRE OX11 0QX, UK
22 July-2 August 1991 BAD WINDSHEIM, GERMANY **900910**

DEFECTS AND DISORDER IN CRYSTALLINE AND AMORPHOUS SOLIDS
Prof. CRA CATLOW, THE ROYAL INSTITUTION, 21 ALBEMARLE STREET, LONDON W1X 4BS,UK
23 September-5 October 1991 EL ESCORIAL, SPAIN **900917**

LASER MANIPULATION OF ATOMS AND IONS
Prof. E ARIMONDO, UNIVERSITY OF PISA, DEPT. OF PHYSICS, I-56100 PISA, ITALY
9-19 July 1991 VARENNA, ITALY **900928**

FUNDAMENTALS OF FRICTION
Dr. IL SINGER, NAVAL RESEARCH LABORATORY, TRIBOLOGY SECTION/CODE 6176,WASHINGTON, DC 20375, USA
29 July-9 August 1991 BRAUNLAGE, GERMANY **900938**

NUCLEAR MAGNETIC RESONANCE IN MODERN TECHNOLOGY
Prof. GE MACIEL, COLORADO STATE UNIVERSITY, DEPT. OF CHEMISTRY, FORT COLLINS,CO 80523, USA
18-30 August 1991 BODRUM, TURKEY **900944**

MICROSCOPIC SIMULATIONS OF COMPLEX HYDRODYNAMIC PHENOMENA
Dr. M MARESCHAL, UNIVERSITE LIBRE DE BRUXELLES, CHIMIE PHYSIQUE II, CP.231, BLD. DU TRIOMPHE, B-1050 BRUXELLES, BELGIUM
15-27 July 1991 ALGHERO, SARDINIA (COP)**901104**

ASTRONOMY & ASTROPHYSICS

THE SUN: A LABORATORY FOR ASTROPHYSICS
Dr. JT SCHMELZ, NASA/GODDARD SPACE FLIGHT CENTER, SMM-XRP CODE 602.6, GREENBELT, MD 20771, USA
16-29 June 1991 CRIEFF, SCOTLAND, UK **900390**

INFRARED ASTRONOMY WITH INFRARED SPACE OBSERVATORY
Dr. T ENCRENAZ, CNRS, OBSERVATOIRE DE PARIS, F-92195 MEUDON CEDEX, FRANCE
13-27 June 1991 LES HOUCHES, FRANCE **900780**

CLUSTERS AND SUPERCLUSTERS OF GALAXIES
Prof. AC FABIAN, INSTITUTE OF ASTRONOMY, UNIVERSITY OF CAMBRIDGE, MADINGLEY ROAD, CAMBRIDGE CB3 0HA, UK
1-12 July 1991 CAMBRIDGE, UK **900901**

THE INFRARED AND SUBMILLIMETRE SKY AFTER THE COSMIC BACKGROUND EXPLORER SATELLITE
Dr.MG SIGNORE,ECOLE NORMALE SUPERIEURE, LAB.DE RADIOASTRONOMIE, 24 RUE LHOMOND, 75231 PARIS CEDEX 05, FRANCE
20-30 March 1991 LES HOUCHES, FRANCE **900906**

MATHEMATICS

FINITE AND INFINITE COMBINATORICS IN SETS AND LOGIC
Prof. NW SAUER, UNIVERSITY OF CALGARY, DEPT. OF MATHS. & STATS ,2500 UNIVERSITY DRIVE, N.W., CALGARY, ALBERTA, CANADA T2N 1N4
21 April-4 May 1991 BANFF, ALBERTA, CANADA **900413**

ALGEBRAS AND ORDERS
Prof. A DAIGNEAULT, UNIVERSITE DE MONTREAL, DEP. DE MATHEMATIQUES & DE STATISTIQUE, C.P. 6128, SUCC. A, MONTREAL, P.Q., CANADA H3C 3J7
29 July-9 August 1991 MONTREAL, CANADA **900755**

APPROXIMATION THEORY,SPLINE FUNCTIONS & APPLICATIONS
Prof. SP SINGH, MEMORIAL UNIVERSITY, DEPT. OF MATHEMATICS & STATISTICS, ST. JOHNS, NEWFOUNDLAND, CANADA ALC 5S7
29 April-10 May 1991 MARATEA, ITALY **900870**

PROBABILISTIC AND STOCHASTIC METHODS IN ANALYSIS, WITH APPLICATIONS
Dr. JS BYRNES, PROMETHEUS INC., 21 ARNOLD AVENUE, NEWPORT, RI 02840, USA
14-27 July 1991 IL CIOCCO, ITALY **900889**

COMPUTER & SYSTEMS SCIENCES

RECENT DEVELOPMENTS IN DECISION SUPPORT SYSTEMS
Prof. AB WHINSTON, THE UNIVERSITY OF TEXAS AT AUSTIN, DEPT.OF MANAGEMENT SCIENCE & INFORMATION SYSTEMS, AUSTIN, TX 78712-1175, USA
16-28 June 1991 IL CIOCCO, ITALY **900400**

LOGIC AND ALGEBRA OF SPECIFICATION
Prof. FL BAUER, TECHNISCHE UNIVERSITAT MUNCHEN, INSTITUT FUR INFORMATIK, ARCISSTR. 21, POSTFACH 20 24 20, D-8000 MUNCHEN 2, GERMANY
23 July-4 August 1991 MARKTOBERDORF, GERMANY **900743**

PARALLEL COMPUTING ON DISTRIBUTED MEMORY MULTIPROCESSORS
Dr. F OZGUNER, THE OHIO STATE UNIVERSITY, DEPT. OF ELECTRICAL ENGINEERING, 2015 NEIL AVENUE, COLUMBUS, OHIO 43210, USA
1-13 July 1991 ANKARA, TURKEY **900873**

BATCH PROCESSING SYSTEMS ENGINEERING: CURRENT STATUS AND FUTURE DIRECTIONS
Prof. A SUNOL, SOUTH FLORIDA UNIVERSITY, CHEMICAL ENGINEERING DEPT , TAMPA, FL 33620-5350, USA
1-10 June 1991 ISTANBUL, TURKEY **900977**

Advanced Study Institutes (continued)

APPLIED SCIENCES & ENGINEERING

ZEOLITE MICROPOROUS SOLIDS: SYNTHESIS, STRUCTURE, AND REACTIVITY
Prof.EG DEROUANE,FACULTES UNIVERSITAIRES N.D.DE LA PAIX, LAB.DE CATALYSE,61 RUE DE BRUXELLES, B-5000 NAMUR, BELGIUM
13-25 May 1991 ESTORIL, PORTUGAL **900096**

PHYSICS AND MATERIALS SCIENCE OF HIGH TEMPERATURE SUPERCONDUCTORS
Dr. R KOSSOWSKY, M.M.F.D., 6327 BURCHFIELD AVENUE, PITTSBURGH, PA 15217, USA
18-31 August 1991 CORFU, GREECE **900339**

EQUILIBRIUM STRUCTURE AND PROPERTIES OF SURFACES AND INTERFACES
Dr. A GONIS, LAWRENCE LIVERMORE NATIONAL LABORATORY, L-268, LIVERMORE, CA 94550, USA
18-30 August 1991 MALEME, CRETE, GREECE **900340**

INNOVATIONS IN ADVANCED FLOTATION TECHNOLOGY
Dr. KA MATIS, ARISTOTLE UNIVERSITY OF THESSALONIKI, DEPT. OF CHEMISTRY, BOX 114,GR-54006 THESSALONIKI, GREECE
12-25 May 1991 HALKIDIKI, GREECE **900392**

OPTIMIZATION OF LARGE STRUCTURAL SYSTEMS
Prof. G ROZVANY, UNIVERSITAT ESSEN, FB 10, POSTFACH 10 37 64, 4300 ESSEN 1, GERMANY
23 Sept.-4 October 1991 BERCHTESGADEN, GERMANY **900419**

RECENT ADVANCES IN INDUSTRIAL APPLICATIONS OF BIOTECHNOLOGY
Prof. SS SUKAN, EGE UNIVERSITY, BIOTECHNOLOGY CENTRE, 35100 BORNOVA, IZMIR, TURKEY
16-27 September 1991 KUSADASI, TURKEY **900722**

INDUSTRIAL AIR POLLUTION: ASSESSMENT AND CONTROL
Dr. A MUEZZINOGLU, DOKUZ EYLUL UNIVERSITY, DEPT. OF ENVIRONMENTAL ENGINEERING, FACULTY OF ENGINEERING-ARCHITECTURE, BORNOVA-IZMIR, TURKEY
29 April-12 May 1991 AKBUK-DIDIM, TURKEY **900756**

HIGH TEMPERATURE SUPERCONDUCTIVITY - MECHANISMS, MATERIALS AND DEVICES
Dr. DP TUNSTALL, UNIVERSITY OF ST. ANDREWS, DEPT. OF PHYSICS & ASTRONOMY, NORTH HAUGH, ST. ANDREWS, FIFE KY16 9SS, UK
17-28 June 1991 ST. ANDREWS, SCOTLAND, UK **900757**

DEVELOPMENTS IN DYNAMIC SOIL STRUCTURE INTERACTION
Prof. P GULKAN, MIDDLE EAST TECHNICAL UNIVERSITY, CIVIL ENGINEERING DEPT., 06531 ANKARA, TURKEY,
10-21 June 1991 ANTALYA, TURKEY **900801**

CONCURRENT ENGINEERING TOOLS AND TECHNOLOGIES FOR MECHANICAL SYSTEM DESIGN
Dr. EJ HAUG, THE UNIVERSITY OF IOWA, CENTRE FOR COMPUTER AIDED DESIGN, 208 ENGINEERING RESEARCH FACILITY, IOWA CITY, IA 52242, USA
12-23 August 1991 IOWA CITY, USA **900881**

SEMICONDUCTOR MATERIALS AND PROCESSING TECHNOLOGIES: THE ROLE OF PHASE TRANSITION, DEFECTS AND DIFFUSION
Dr. JM POATE, AT&T BELL LABORATORIES, MURRAY HILL, 600 MOUNTAIN AVE., MURRAY HILL, NJ 07974, USA
1-15 July 1991 ERICE, SICILY, ITALY **901097**

THE BEHAVIOR OF SYSTEMS IN THE SPACE ENVIRONMENT
Dr. RN DEWITT, NAVAL SURFACE WARFARE CENTER, ENERGY TECHNOLOGY BRANCH, CODE R42, SILVER SPRING, MD 20903, USA
7-19 July 1991 PITLOCHRY, SCOTLAND, UK **901114**

EARTH SCIENCES

FLOW AND DYNAMIC MODELING OF THE EARTH AND PLANETS
Prof. SK RUNCORN, UNIVERSITY OF ALASKA, GEOPHYSICAL INSTITUTE, FAIRBANKS, AK 99775, USA
19-29 June 1991 FAIRBANKS, ALASKA, USA **900021**

THE GLOBAL CARBON CYCLE
Dr. M HEIMANN, MAX-PLANCK-INSTITUT FUR METEOROLOGIE, BUNDESSTRASSE 55, D-2000 HAMBURG 13, GERMANY
8-20 September 1991 IL CIOCCO, ITALY (SGEC) **901122**

ENERGY AND WATER CYCLES IN THE CLIMATE SYSTEM
Prof. E RASCHKE, GKSS RESEARCH CENTRE, INSTITUTE FOR PHYSICS, D-2054 GEESTHACHT, GERMANY
30 Sept.-11Oct. 1991 LUNEBURG, GERMANY (SGEC) **901129**

SOCIAL & BEHAVIOURAL SCIENCES

COGNITIVE NEUROPSYCHOLOGY OF READING AND WRITING DISABILITIES:DIFFERENTIAL DIAGNOSIS AND TREATMENTS
Dr. R MALATESHA JOSHI, OKLAHOMA STATE UNIVERSITY, COLLEGE OF EDUCATION, 103 GUNDERSEN HALL, STILLWATER, OK 74078-0146, USA
30 September-12 October 1991 BONAS, FRANCE **900417**

CRIME AND MENTAL DISORDER
Dr. S HODGINS, UNIV. OF MONTREAL, INSTITUTE PHILIPPE PINEL, DEPT.OF RESEARCH,10905 EST, BOULEVARD HENRI-BOURASSA, MONTREAL, CANADA H1C 1H1
25 August-4 September 1991 IL CIOCCO, ITALY **900462**

GAME THEORETIC METHODS IN ECONOMIC EQUILIBRIUM
Prof. JF MERTENS, UNIVERSITE DE LOUVAIN-LA-NEUVE, CORE, 34 VOIE DE ROMAN PAYS,B-1348 LOUVAIN-LA-NEUVE, BELGIUM
1-12 July 1991 LONG ISLAND, USA **901100**

Advanced Research Workshops

LIFE SCIENCES

FOREST DEVELOPMENT IN COLD CLIMATES
Dr. FH LOCKYEAR, RETREE INTERNATIONAL, P.O. BOX 346, WILSONVILLE, OR 97070, USA
25-30 June 1991 LAUGARVATN, ICELAND **880898**

ONCOGENE AND TRANSGENICS CORRELATES OF CANCER RISK ASSESSMENTS
Dr. C ZERVOS, US FOOD AND DRUGS ADMINISTRATION, PO BOX 105, SIMPSONVILLE, MD 21150, USA
28 April-3 May 1991 CHALKIDILI, GREECE **890761**

DEEP-SEA FOOD CHAINS: THEIR RELATION TO THE GLOBAL CARBON CYCLE
Prof. GT ROWE, TEXAS A&M UNIVERSITY, DEPT OF OCEANOGRAPHY, COLLEGE STATION, TX 77843-3146, USA
1-5 April 1991 COLLEGE STATION, TEXAS, USA **891026**

THE SUPER-FAMILY OF RAS RELATED GENES
Prof. DA SPANDIDOS, NATIONAL HELLENIC RESEARCH FOUNDATION, INST. OF BIOLOGICAL RESEARCH & BIOTECHNOLOGY, 48 VAS CONSTANTINOU AVENUE, ATHENS 11635, GREECE
17-21 May 1991 AGHIA PELAGIA, CRETE, GREECE **900359**

PHOSPHOLIPIDS AND SIGNAL TRANSMISSION
Dr. R MASSARELLI, CENTRE DE NEUROCHIMIE DU CNRS, ANTENNE CRONENBOURG,23 RUE DU LOESS, 67037 STRASBOURG CEDEX, FRANCE
29 May-2 June 1991 WIESBADEN, GERMANY **900453**

FORMATION AND DIFFERENTIATION OF EARLY EMBRYONIC MESODERM
Prof. JW LASH, UNIVERSITY OF PENNSYLVANIA, DEPT.OF ANATOMY /SCHOOL OF MEDICINE, PHILADELPHIA, PA 19104-6058, USA
19-23 April 1991 ANAZYSSOS, GREECE **900477**

BIOLOGICAL CONTROL OF PLANT DISEASES: PROGRESS AND CHALLENGES FOR THE FUTURE
Prof. EC TJAMOS, AGRICULTURAL UNIVERSITY,LABORATORY OF PLANT PATHOLOGY, VOTANIKOS 118 55, ATHENS, GREECE
1-5 May 1991 ATHENS, GREECE **900592**

COHERENT AND EMERGENT PHENOMENA IN BIOMOLECULAR SYSTEMS
Dr. SR HAMEROFF, UNIVERSITY OF ARIZONA HEALTH SCIENCES CENTER, DEPT. OF ANESTHESIOLOGY, TUCSON, AZ 85724, USA
15-19 January 1991 TUCSON, ARIZONA, USA (COP) **900644**

MECHANICS OF SWELLING: FROM CLAYS TO LIVING CELLS AND TISSUES
Prof. TK KARALIS, DEMOCRITOS UNIVERSITY OF THRACE, SCHOOL OF CIVIL ENGINEERING,67100 XANTHI, GREECE
1-6 July 1991 CORFU, GREECE **900721**

PRADER-WILLI SYNDROME AND OTHER CHROMOSOME 15Q DELETION DISORDERS
Prof. SB CASSIDY, UNIVERSITY OF ARIZONA, COLLEGE OF MEDICINE, SECTION OF GENETICS/DYSMORPHOLOGY, TUCSON, AZ 85724, USA
2-3 May 1991 DELEEUWENHORST, NETHERLANDS **900737**

REGULATION OF CHLOROPLAST BIOGENESIS
Dr. JH ARGYROUDI-AKOYUNOGLOU, NRCPS "DEMOKRITOS", INST. OF BIOLOGY, AGHIA PARASKEVI ATTIKIS, ATHENS, GREECE
28 July-2 August 1991 AGHIA PELAGIA, CRETE, **900745**

BASIC MECHANISM OF PHYSIOLOGIC AND ABBERRANT LYMPHOPROLIFERATION IN THE SKIN
Prof. WA VAN VLOTEN, UNIVERSITY HOSPITAL UTRECHT, DEPT. OF DERMATOLOGY, HEIDELBERGLAAN 100, 3584 CX UTRECHT, THE NETHERLANDS
1-6 October 1991 SAN MINIATO, ITALY **900760**

PHYSIOLOGICAL AND COMPUTATIONAL ASPECTS OF CORTICAL FUNCTIONS
Prof. R CAMINITI, UNIVERSITA "LA SAPIENZA", ISTITUTO DI FISIOLOGIA UMANA, PIAZZALE A. MORO 5, I-00185 ROMA, ITALY
20-24 May 1991 ANCONA, ITALY **900761**

THE MARINE DIAZOTROPH TRICHODESMIUM: BIOLOGY AND ECOLOGY
Prof. EJ CARPENTER, STATE UNIVERSITY OF NEW YORK, MARINE SCIENCES RESEARCH CENTER, STONY BROOK, NY 11794, USA
27-31 [illegible] ERMANY **900768**

THE MAMMALIAN COCHLEAR NUCLEI: ORGANIZATION & FUNCTION
Prof. MA MERCHAN, UNIVERSITY OF SALAMANCA, DEPT. OF CELLULAR BIOLOGY & PATHOLOGY, AV. DEL CAMPO CHARRO s.n. 37007, SALAMANCA, SPAIN
14-16 September 1991 SALAMANCA, SPAIN **900820**

SURVIVAL ANALYSIS AND RELATED TOPICS
Prof. JP KLEIN, OHIO STATE UNIV., BIOSTATISTICS PROG., 1958 NEIL AVE. COLUMBUS, OH 43210, USA
23-28 June 1991 COLUMBUS, OHIO, USA **900862**

MHC (MAJOR HISTOCOMPATIBILITY COMPLEX) EVOLUTION
Prof. J KLEIN, M-P INSTITUT FUR BIOLOGIE, ABTEILUNG IMMUNGENETIC, CORRENSSTRASE 42, D-7400 TUBINGEN 1, GERMANY
28 April-2 May 1991 KEY BISCAYNE, FLORIDA, USA **900865**

PLAYBACK AND STUDIES OF ANIMAL COMMUNICATION: PROBLEMS AND PROSPECTS
Dr. PK McGREGOR, UNIVERSITY OF NOTTINGHAM, DEPT. OF ZOOLOGY, UNIVERSITY PARK, NOTTINGHAM NG7 2RD, UK
12-16 August 1991 Nr.SHEFFIELD, UK **900874**

INTRACELLULAR MODULATORS OF CARDIAC AND NEURONAL ION CHANNELS
Prof. M MORAD, UNIVERSITY OF PENNSYLVANIA, SCHOOL OF MEDECINE, DEPT. OF PHYSIOLOGY, 4TH FLOOR, RICHARDS BUILDING, PHILADELPHIA, PA 19104-6085, USA
24-27 April 1991 IL CIOCCO, ITALY **900888**

STRATEGY FOR BIOMARKER RESEARCH AND APPLICATION IN THE ASSESSMENT OF ENVIRONMENTAL HEALTH
Dr. LR SHUGART, ENVIRONMENTAL SCIENCES DIV., OAK RIDGE NATIONAL LAB., P.O.BOX 2008, OAK RIDGE, TN 37831-6036, USA
8-13 May 1991 TEXEL, NETHERLANDS **900903**

BIOLOGY OF SALMONELLA
Prof. F CABELLO, NEW YORK MEDICAL COLLEGE, DEPT. OF MICROBIOLOGY& IMMUNOLOGY, VALHALLA, NY 10595, USA
21-26 April 1991 PORTOROSA, SICILY, ITALY **900926**

PHYSICS AND CHEMISTRY

ASYMPTOTICS BEYOND ALL ORDERS
Prof. H SEGUR, UNIVERSITY OF COLORADO, PROGRAM IN APPLIED MATHEMATICS, BOULDER, CO 80309-0426, USA
7-11January 1991 SAN DIEGO, CA., USA (COP) **891056**

PROTON TRANSFER IN HYDROGEN-BONDED SYSTEMS
Dr. S PNEVMATIKOS, UNIVERSITY OF CRETE, FOUNDATION FOR RESEARCH & TECHNOLOGY, PO BOX 1527, 71110 HERAKLION, CRETE, GREECE
21-25 May 1991 HERAKLION, CRETE (COP) **900377**

QUANTUM MEASUREMENTS IN OPTICS
Prof. P TOMBESI, UNIVERSITY OF ROME "LA SAPIENZA", DEPT. OF PHYSICS, PIAZZALE A. MORO 2, 00185 ROMA, ITALY
22-26 January 1991 CORTINA D'AMPEZZO, ITALY **900399**

NEW TECHNOLOGIES FOR SUBNUCLEAR PHYSICS
Prof. A ZICHICHI, CERN, EP DIVISION, CH-1211 GENEVA 23, SWITZERLAND
3-7 July 1991 ERICE, SICILY, ITALY **900435**

ORDERED INTERMETALLICS: PHYSICAL METALLURGY AND MECHANICAL BEHAVIOR
Dr. CT LIU, OAK RIDGE NATIONAL LABORATORY, P.O.BOX 2008, OAK RIDGE, TN 37831-6115, USA
23-29 June 1991 IRSEE, GERMANY **900445**

CLUSTER MODELS FOR SURFACE AND BULK PHENOMENA
Prof. G PACCHIONI, UNIVERSITY OF MILANO, DIP.DI CHIMICA INORGANICA E METALLORGANICA, VIA VENEZIAN 21, 20133 MILANO, ITALY
21-27 April 1991 ERICE, SICILY, ITALY **900522**

FRONTIERS OF HIGH PRESSURE RESEARCH
Dr. HD HOCHHEIMER, COLORADO STATE UNIVERSITY, DEPT. OF PHYSICS, FORT COLLINS, CO 80523, USA
15-18 July 1991 FORT COLLINS, COLORADO, USA **900538**

QUANTUM CHAOS - THEORY AND EXPERIMENT
Dr. P CVITANOVIC, NIELS BOHR INST., BLEGDAMSVEJ 17, DK-2100 KOBENHAVN, DENMARK
28 May-1 June 1991 COPENHAGEN, DENMARK **900725**

THE ROLE OF COMPUTATIONAL MODELS AND THEORIES IN BIOTECHNOLOGY
Prof. J BERTRAN, UNIVERSIDAD AUTONOMA, BARCELONA, DEPT. DE QUIMICA FISICA, 08193 BELLATERRA, BARCELONA, SPAIN
13-19June 1991 SANT FELIU DE GUIXOLS,SPAIN **900728**

ORDERED AND TURBULENT PATTERNS IN TAYLOR-COUETTE FLOW
Prof. CD ANDERECK, OHIO STATE UNIV, DEPT. OF PHYSICS, 174 WEST 18TH AVENUE, COLUMBUS, OH 432105713, USA
22-24 May 1991 COLUMBUS, OHIO, USA **900763**

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Prof. EPJ VAN DEN HEUVEL, UNIVERSITY OF AMSTERDAM, ROETERSSTRAAT 15, 1018 WB AMSTERDAM, NETHERLANDS
14-18 January1991 SANTA BARBARA,CA., USA **900769**

STATUS AND FUTURE DEVELOPMENTS IN THE STUDY OF TRANSPORT PROPERTIES
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29-31May1991 PORTO CARRAS, GREECE **900771**

NEW TRENDS IN NONLINEAR DYNAMICS: NONVARIATIONAL ASPECTS
Prof. C PEREZ-GARCIA, UNIVERSIDAD DE NAVARRA, DEPT. OF PHYSICS, 31080 PAMPLONA (NAVARRA), SPAIN
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5-10 May 1991 NIAGARA ON THE LAKE. CANADA **900857**

EMULSIONS - A FUNDAMENTAL AND PRACTICAL APPROACH
Prof. J SJOBLOM, UNIVERSITY OF BERGEN, DEPT. OF CHEMISTRY, N-5007 BERGEN, NORWAY,
24-25 June 1991 BERGEN, NORWAY **900861**

NUCLEAR SHAPES AND NUCLEAR STRUCTURE AT LOW EXCITATION ENERGIES
Dr. J SAUVAGE, INSTITUT DE PHYSIQUE NUCLEAIRE, 91406 ORSAY CEDEX, FRANCE
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22-27 September 1991 CAMBRIDGE, UK **900934**

QUANTUM FIELD THEORY, STATISTICAL MECHANICS, QUANTUM GROUPS, AND TOPOLOGY
Prof. TL CURTRIGHT, UNIVERSITY OF MIAMI, CORAL GABLES, DEPT. OF PHYSICS, PO BOX 248046, CORAL GABLES, FL33124, USA
7-12 January 1991 CORAL GABLES, FLORIDA, USA **900972**

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Prof. J-P BOON, UNIVERSITE LIBRE DE BRUXELLES, FACULTE DES SCIENCES, CAMPUS PLAINE, CP 231, B-1050 BRUSSELS, BELGIUM
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Prof. P VAN NIEUWENHUIZEN, STATE UNIV. OF NEW YORK AT STONY BROOK, INST. FOR THEORETICAL PHYSICS, STONY BROOK, NY 11794-3840, USA
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15-20 December 1991 TAORMINA, SICILY, ITALY **901148**

MATHEMATICS

APPROXIMATION BY RESOLUTIONS OF PARTIAL DIFFERENTIAL EQUATIONS, QUADRATURE FORMULAE & RELATED TOPICS
Prof. M GOLDSTEIN, ARIZONA STATE UNIVERSITY, DEPT. OF MATHEMATICS, TEMPE, AZ 85287, USA
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Prof. R HERMAN, UNIV. OF MARYLAND, 2300 MATHS. BUILDING, COLLEGE PARK, MD 20742, USA
1-5 July 1991 ISTANBUL, TURKEY **900891**

INVERSE PROBLEMS IN SCATTERING AND IMAGING
Prof. M BERTERO, UNIVERSITA DI GENOVA, DIP. DI FISICA, VIA DODECANESO 33, I-16146 GENOVA, ITALY
14-19 April 1991 CAPE COD, MA, USA **900914**

SINGULAR LIMITS OF DISPERSIVE WAVES
Prof. NM ERCOLANI, UNIV. OF ARIZONA, DEPT. OF MATHEMATICS, TUCSON, AZ 85721, USA
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COMPUTER & SYSTEMS SCIENCES

NUMERICAL INTEGRATION: RECENT DEVELOPMENTS, SOFTWARE AND APPLICATIONS
Prof. TO ESPELID, UNIV. OF BERGEN, DEPT. OF INFORMATICS, THORMOHLENSGT. 55, 5008 BERGEN, NORWAY
17-21 June 1991 BERGEN, NORWAY **900746**

ASYMPTOTIC-INDUCED NUMERICAL METHODS FOR PDEs, CRITICAL PARAMETERS AND DOM DECOMPOSITION
Dr. HG KAPER, ARGONE NATIONAL LABORATORY, MATHEMATICS & COMPUTER SCIENCE DIV., 9700 S. CASS AVE., LEMONT, IL 60439, USA
5-8 June 1991 NOLAY, FRANCE **901119**

APPLIED SCIENCES & ENGINEERING

RELIABILITY-BASED DESIGN OF ENGINEERED WOOD STRUCTURES
Prof. J BODIG, ENGINEERING DATA MANAGEMENT INC., 4700 McMURRAY AVENUE, BLDG A, FORT COLLINS, CO 80525, USA
3-5 June 1991 STEAMBOAT, COLORADO, USA **900381**

MEASUREMENT OF RESIDUAL AND APPLIED STRESS USING NEUTRON DIFFRACTION
Dr. MT HUTCHINGS, AEA TECHNOLOGY, MATERIALS PHYSICS & METALLURGY DIVISION, B 521 1, DIDCOT OX11 ORA, UK
18-22 March 1991 OXFORD, UK **900814**

EMERGING TECHNOLOGIES FOR IN-SITU PROCESSING
Dr. J MELNGAILIS, MASSACHUSETTS INSTITUTE OF TECHNOLOGY, ROOM 39-427, CAMBRIDGE, MA 02139, USA
23-27 September 1991 DALAMAN, TURKEY **900855**

SENSORS & SENSORY SYSTEMS FOR AN ELECTRONIC NOSE
Dr. J GARDNER, UNIVERSITY OF WARWICK, DEPT. OF ENGINEERING, COVENTRY CV4 7AL, UK
5-8 August 1991 REYKJAVIK, ICELAND **900883**

CLAY SWELLING AND EXPANSIVE SOILS
Dr. P BAVEYE, CORNELL UNIVERSITY, ITHACA, SOIL SCIENCE DEPT, BRADFIELD HALL, ITHACA, NY 14853, USA
12-16 August 1991 ITHACA, NEW YORK, USA **900931**

EARTH SCIENCES

INTERACTIONS OF C,N,P AND S BIOGEOCHEMICAL CYCLES
Prof. R WOLLAST, U.L.B., LABORATOIRE D'OCEANOGRAPHIE CHIMIQUE, CAMPUS PLAINE, C.P. 208, BOULEVARD DU TRIOMPHE, B-1050 BRUSSELS, BELGIUM
4-8 March 1991 MELREUX, BELGIUM (SGEC) **900809**

CLIMATE CHANGE: THE BIOLOGICAL IMPLICATIONS
Prof. K PETERSON, CLEMSON UNIVERSITY, DEPT. OF BIOLOGICAL SCIENCES, CLEMSON, SC 29634, USA
15-19 October 1991 CLEMSON, SC, USA (SGEC) **900819**

OPPORTUNITIES FOR HYDROLOGICAL DATA IN SUPPORT OF CLIMATE CHANGE STUDIES
Prof. H LIEBSCHER, GLOBAL RUNOFF DATA CENTRE, BUNDESANSTALT FUR GEWASSERKUNDE, KAISERIN-AUGUSTA-ANLAGEN 15-17, 5400 KOBLENZ, GERMANY
26-30 August 1991 LAHNSTEIN, GERMANY (SGEC) **901085**

CORRELATING RECORDS OF THE PAST
Dr. G KUKLA, COLUMBIA UNIVERSITY, LAMONT-DOHERTY GEOLOGICAL OBSERVATORY, PALISADES, NY 10964, USA
4-9 April 1991 MALLORCA, SPAIN (SGEC) **901105**

THE GLOBAL CYCLE OF METHANE: SOURCES, SINKS, DISTRIBUTIONS AND ROLE IN GLOBAL CHANGE
Dr. M ASLAM KHAN KHALIL, OREGON GRADUATE INSTITUTE, 19600 N.W. VON NEUMANN DR., BEAVERTON, OR 97006, USA
November 1991 PORTLAND, OREGON, USA (SGEC) **901110**

TOWARDS A MODEL OF OCEAN BIOGEOCHEMICAL PROCESSES
Dr. MJR FASHAM, INSTITUTE OF OCEANOGRAPHIC SCIENCES, DEACON LABORATORY, BROOK ROAD, WORMLEY, GODALMING, SURREY GU8 5UB, UK
November 1991 BONAS, FRANCE (SGEC) **901111**

PREDICTION OF INTERANNUAL CLIMATE VARIATIONS
Prof. J SHUKLA, UNIVERSITY OF MARYLAND, DEPT. OF METEOROLOGY, CENTER FOR OCEAN-LAND-ATMOSPHERE INTERACTION, COLLEGE PARK, MD 20742, USA
22-26 July 1991 TRIESTE, ITALY (SGEC) **901116**

MODELLING SUSTAINABLE DEVELOPMENT AND GLOBAL ENVIRONMENTAL CHANGE
Pr. RA BERK, UCLA SOCIOLOGY DEPT., 264 HAINES HALL, 405 HILGARD, LOS ANGELES, CA 90024-1551, USA
11-17 Nov. 1991 LAKE ARROWHEAD, CA, USA (SGEC) **901121**

PALEOCLIMATE MODELLING
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27-31 May 1991 GIF-SUR-YVETTE, FRANCE (SGEC) **901124**

SOCIAL & BEHAVIOURAL SCIENCES

INSTRUCTIONAL MODELS IN COMPUTER-BASED LEARNING ENVIRONMENTS
Dr. S DIJKSTRA, UNIVERSITY OF TWENTE, DEPT. OF EDUCATION, P.O. BOX 217, 7500 AE ENSCHEDE, THE NETHERLANDS
1-4 July 1991 ENSCHEDE, NETHERLANDS (AET) **891048**

AUTHORING ENVIRONMENTS FOR COMPUTER-BASED COURSEWARE
Prof. R LEWIS, UNIVERSITY OF LANCASTER, DEPT. OF PSYCHOLOGY, LANCASTER LA1 4YF, UK
26-30 May 1991 MARATEA, ITALY (AET) **891055**

LEARNING ELECTRICITY OR ELECTRONICS WITH ADVANCED EDUCATIONAL TECHNOLOGY
Prof. M CAILLOT, UNIVERSITE PARIS VII, LIREST, 2 PLACE JUSSIEU, 75251 PARIS CEDEX 05, FRANCE
24-27 June 1991 MARNE-LA-VALLEE, FRANCE (AET) **900439**

INTERACTIVE LEARNING SYSTEMS: HUMAN FACTORS AND TECHNICAL CONSIDERATIONS
Dr. M GIARDINA, UNIVERSITE LAVAL, DEP. DE TECHNOLOGIE EDUCATIVE, 1466 PAVILLON DE KONINCK, STE-FOY (QUEBEC), CANADA G1K 7P4
10-14 June 1991 STE-FOY, QUEBEC, CANADA (AET) **900461**

THEORETICAL PERSPECTIVES ON AUTOBIOGRAPHICAL MEMORY
Dr. MA CONWAY, LANCASTER UNIVERSITY, DEPT. OF PSYCHOLOGY, LANCASTER LA1 4YF, UK
9-13 July 1991 GRANGE-OVER-SANDS, UK **900724**

CONFLICT, CRIME AND RECONCILIATION - THE ORGANIZATION OF WELFARE INTERVENTION IN THE FIELD OF RESTITUTIVE JUSTICE
Prof. HU OTTO, UNIVERSITY OF BIELEFELD, POSTBOX 8640, D-4800 BIELEFELD, GERMANY,
8-12 April 1991 IL CIOCCO, ITALY **900727**

INTERACTIVE LEARNING TECHNOLOGY FOR THE DEAF
Dr. F CONINX, INST. VOOR DOVEN, DEPT. FOR RESEARCH & DEVELOPMENT, THEERESTRAAT 42, 5271 GD SINT-MICHIELSGESTEL, THE NETHERLANDS
4-7 June 1991 SINT-MICHIELSGESTEL, NETHERLANDS (AET) **901101**

THE DESIGN OF CONSTRUCTIVIST LEARNING ENVIRONMENTS: IMPLICATIONS FOR INSTRUCTIONAL DESIGN AND THE USE OF TECHNOLOGY
Prof. TM DUFFY, INDIANA UNIVERSITY, INSTRUCTIONAL SYSTEMS TECHNOLOGY, 210 EDUCATION, BLOOMINGTON IN 47405, USA
14-18 May 1991 LEUVEN, BELGIUM (AET) **901103**

STUDENT MODELLING: THE KEY TO INDIVIDUALIZATION IN ADVANCED EDUCATIONAL COMPUTER SYSTEMS
Prof. G McCALLA, UNIVERSITY OF SASKATCHEWAN, ARIES LABORATORY, DEPT. OF COMPUTATIONAL SCIENCE, SASKATOON, SK, CANADA S7N 030
5-8 May 1991 QUEBEC, CANADA (AET) **901107**

ADVANCED MODELS OF COGNITION FOR MEDICAL TRAINING AND PRACTICE
Prof. VL PATEL, MCGILL UNIVERSITY, DEPT. OF MEDICINE & EDUCAT. PSYCHOLOGY, 3655 DRUMMOND STREET, ROOM 529, MONTREAL, QUEBEC, CANADA H3G 1Y6
17-21 June 1991 SORRENTO, ITALY (AET) **901135**

INFORMATION TECHNOLOGIES AND MATHEMATICAL PROBLEM SOLVING RESEARCH
Prof. JP MENDES DA PONTE, UNIVERSIDADE DE LISBOA, FAC. DE CIENCIAS, AV. 24 DE JULHO, 134-4E, 1300 LISBOA, PORTUGAL
27-30 APRIL 1991 VIANA DO CASTELO, PORTUGAL (AET) **901136**

INTELLIGENT TUTORIAL SYSTEMS IN GEOGRAPHY
Dr. H CHAMUSSY, UNIVERSITE JOSEPH FOURIER, INST. DE GEOGRAPHIE ALPINE, 17 RUE MAURICE GIGNOUX, 38031 GRENOBLE CEDEX, FRANCE
19-22 November 1991 MONTPELLIER, FRANCE (AET) **901137**

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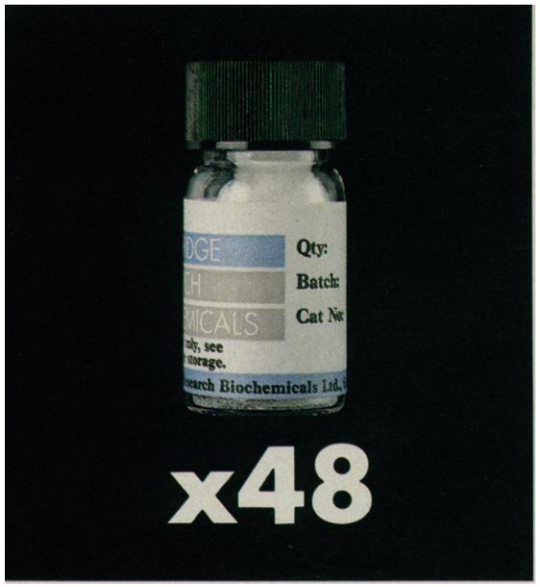

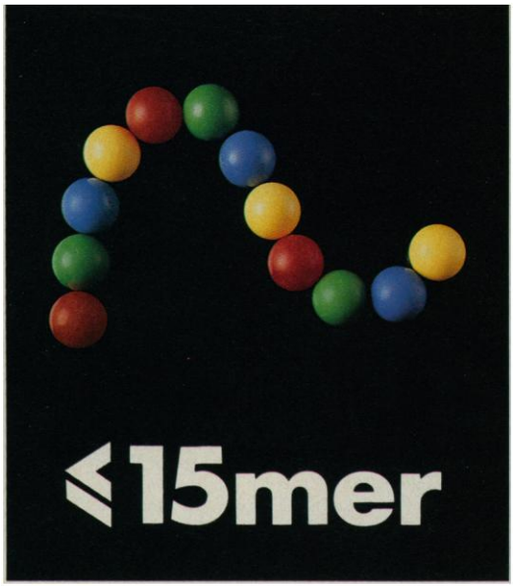

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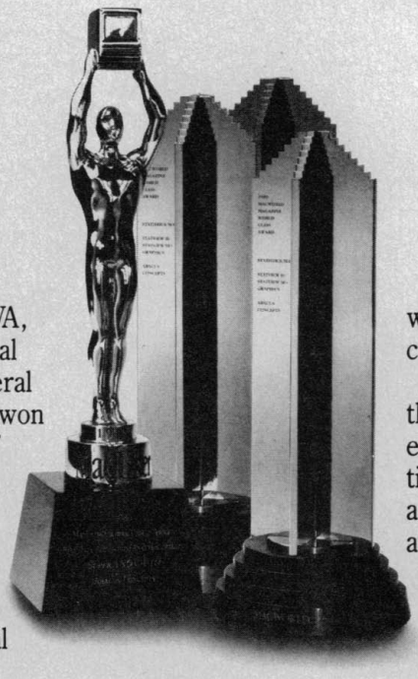

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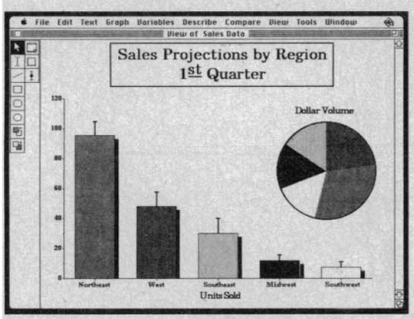

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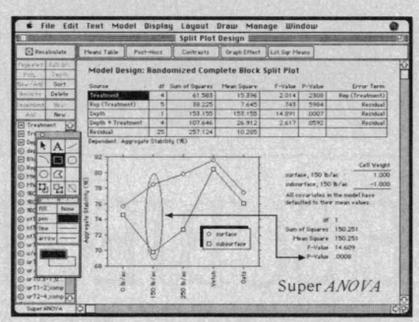

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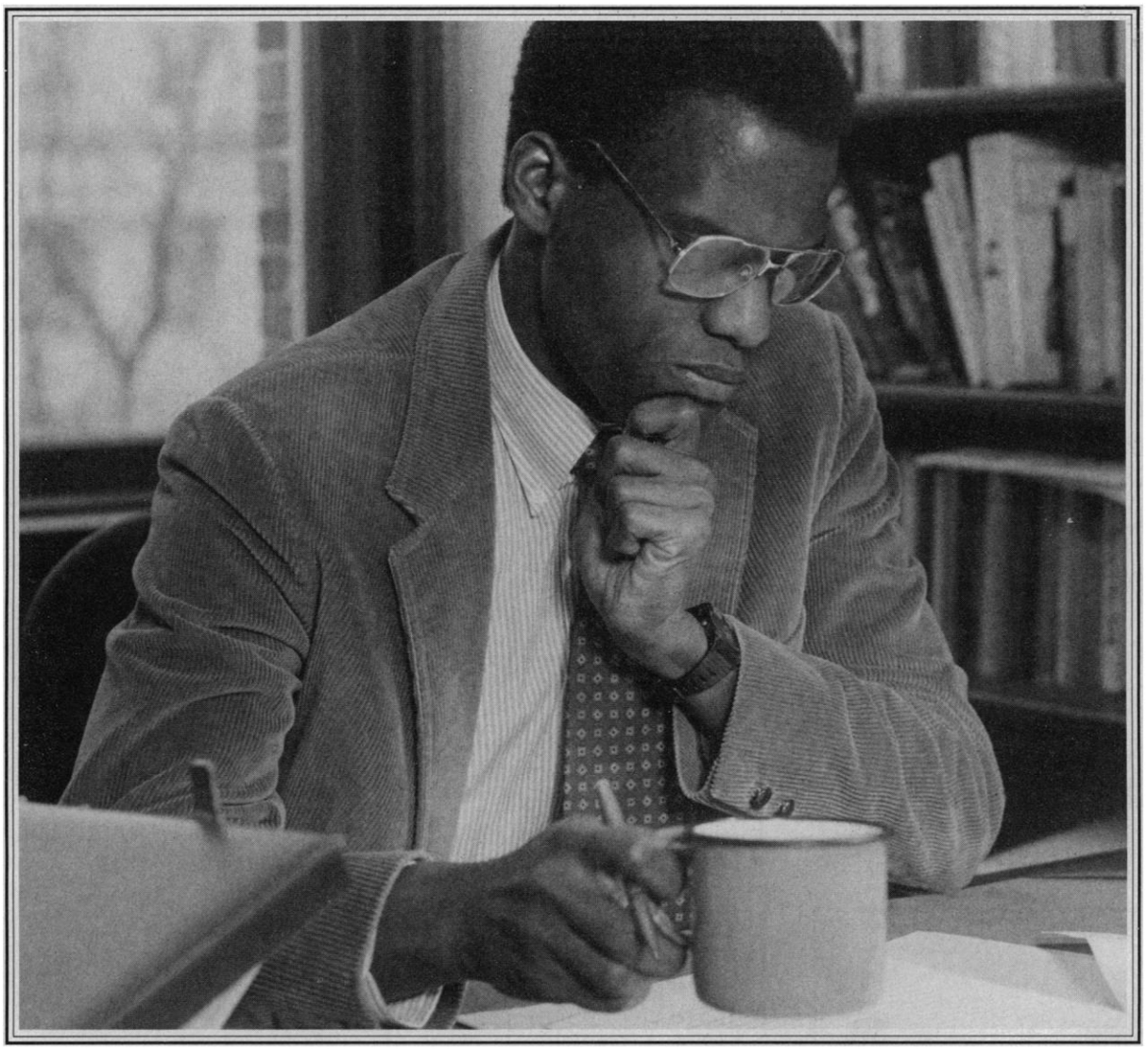

THE SUBJECT IS MORE THAN ACADEMIC.

For a while, it seemed that investments only went up—and the higher the risk, the bigger the gain. Nowadays, many investors are learning that the risks are real. What goes up *can* come down.

But how well your retirement investments perform throughout your career can determine how well you'll live when you retire. Especially in times like these, it's important to know that your retirement funds are well-managed. But how do you judge? Consider these principles:

RETIREMENT INVESTING IS LONG TERM

A long-term view helps you avoid short-term risks. When you make steady contributions to your retirement plan over long periods, you minimize the effects of market fluctuations, *and* you gain the advantages of compounded growth and interest.

TIAA, an insurance company, backs your traditional annuity with long-term mortgages, bonds, and real estate investments. And TIAA's size and strong capital base mean it can ride out swings in the market—buying or selling only when the time is right.

The bottom line: because of its stability, sound investments, and overall financial strength, TIAA has received the highest possible ratings from all three of the industry's leading independent rating agencies—A+ (Superior) from A.M. Best Co., Aaa from Moody's, and AAA from Standard & Poor's.

DIVERSIFY FOR SAFETY AND GROWTH

A diverse mix of quality investments helps protect you from market volatility and lets you benefit from the strengths of several types of investments. Most retirement experts recommend diversification as the key to successful retirement savings.

You get opportunities for widespread diversity with each of CREF's variable annuity accounts. The CREF Stock Account holds a broad portfolio of domestic and foreign stocks, and CREF's Social Choice Account invests in a balanced portfolio of stocks, bonds and money market instruments. CREF's Money Market and Bond Market Accounts offer you further avenues to diversification.

TAKE APPROPRIATE RISKS—NOT MORE

Try to strike a balance. Be conservative enough so the resources will be there when you need them. But look for enough growth potential that your retirement income will support the kind of retirement you want.

PAY ATTENTION TO PERFORMANCE

Compare your investments' performance to their stated objectives. Have they done what they said they would do? Over long periods?

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LOOK FOR INVESTMENT EXPERTISE

Finally, retirement investing is a specialized skill, so look at who is managing your retirement savings. TIAA and CREF are recognized experts in retirement investing, with over 70 years of experience serving the academic community.

In fact, we've done so well, for so many, for so long that TIAA-CREF is now the largest retirement system in the world, with over $80 billion under management.

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Ensuring the future for those who shape it.℠

1. American Council of Life Insurance 2. Lipper Analytical Services, Inc., Mutual Fund Performance Analysis Reports. Growth Funds Index and General Equities Funds Averages, ending 9/30/90.

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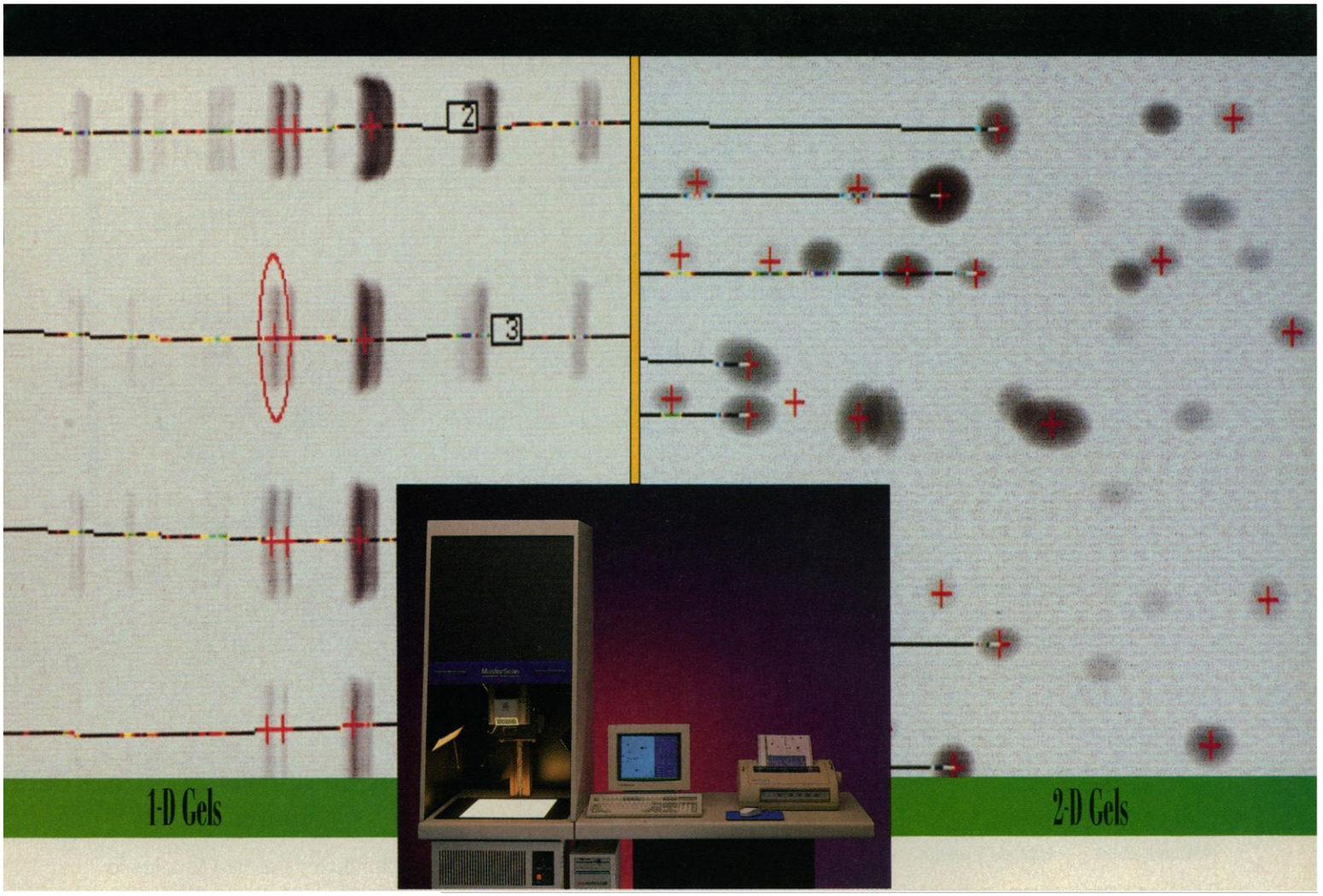

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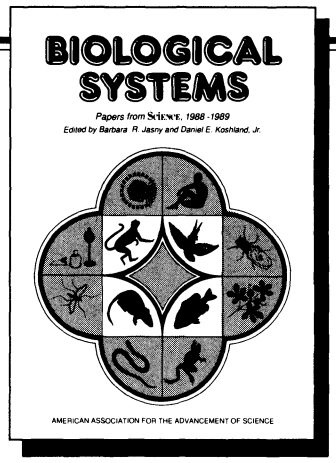

Biological Systems

Edited by Barbara R. Jasny and Daniel E. Koshland, Jr.

This collection of *Science* magazine articles explores some of the diverse biological systems in research today. The authors describe major experimental systems in terms of the state of the art, potential advantages, and possible disadvantages for particular kinds of research.

Organisms explored range from retroviruses to humans, and the aspects of biological processes in which they have been applied include developmental and molecular biology, genetics, immunology, and behavior. Genetic engineering is also discussed as a means of designing optimal systems for basic research and the biotechnology industry. The information presented will be especially useful to graduate students and to all researchers interested in learning the limitations and assets of biological systems currently in use.

1990; 288 pp.; fully indexed and illustrated
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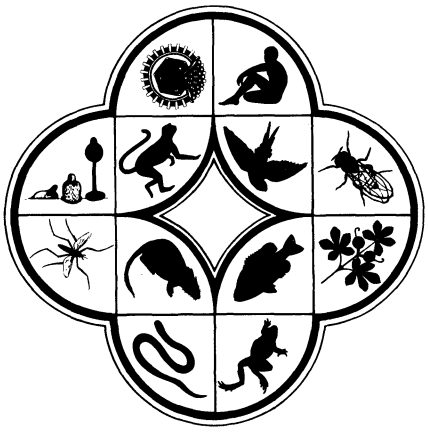

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