

Authors

Arieh Aviram

Thomas J. Watson Research Center, Yorktown Heights, New York

Mr. Aviram is a Research Associate in the liquid crystal group. He joined IBM in 1968 and has worked as organic chemist on mechanistic and liquid crystal studies. He received his B.S. in Chemistry from the Technion, Israel Institute of Technology in 1965 and worked at Ayerst Pharmaceutical Corporation, before joining IBM.

Edward M. Barrall II

Research Division, San Jose, California

Dr. Barrall is a Staff Member at the Research Division Laboratory in San Jose. He has been with IBM since 1969. Prior to joining the IBM staff he was a Senior Research Chemist at Chevron Research Company, Richmond, California for eight years. He received a B.S. in Chemistry in 1955 from the University of Louisville and an M.S. in Analytical Chemistry from the same university in 1957. He received a Ph.D. in Analytical Chemistry in 1961 from MIT. Dr. Barrall has worked for the Army Ballistics Missile Agency, W. R. Grace and E. I. DuPont and has taught at the Universities of Louisville and Georgia. His professional interests for the past 12 years have been thermal methods of analysis and polymer characterization. He is a member of the American Chemical Society, Sigma Xi, North American Thermal Analysis Society, the International Confederation for Thermal Analysis, and is listed in American Men of Science. He is currently acting secretary of N.A.T.A.S.

George Castro

Research Division, San Jose, California

Dr. Castro is head of the Organic Photoconductor Project in the Molecular Physics Department at the Research Laboratory in San Jose. He has been with IBM since 1968. He received a B.S. in Chemistry from the University of California at Los Angeles in 1960 and a Ph.D. in Chemistry from the University of California at Riverside in 1965. He was a Research Fellow in Chemistry at Dartmouth College, 1962-1965, and was a Post-doctoral Fellow at both the University of Pennsylvania, 1965-1967, and the California Institute of Technology, 1967-1968.

Richard A. Ellefsen

Department of Geography, San Jose State College, San Jose, California

Dr. Ellefsen is a professor of Geography at San Jose State College where he has been since 1960. His education includes an A.B. from San Jose State College, 1955; an M.A. in 1958 from Clark University, Worcester, Massachusetts; and a Ph.D. from the University of California in 1968. He was awarded one of seven Distinguished Teacher Awards for the California State College system in 1966. He was on the staff of International Urban Research at the University of California, Berkeley in 1959-60. His research includes work for a year and half in India examining the character of milk supply for Indian cities. Local research has been directed towards urban problems. He is a member of the California Council of Geography, the Association of Pacific Coast Geographers, and the Association of American Geographers.

Ivan Haller

Thomas J. Watson Research Center, Yorktown Heights, New York

Dr. Haller joined IBM at the Research Center in 1960. His research interests have been in various aspects of photochemistry, spectroscopy, interaction of electron beams with matter, and liquid crystals. His education includes a B.S. from the University of Technical Sciences, Budapest in 1956, and a Ph.D. in Chemistry in 1961 from the University of California, Berkeley. He is a member of the American Chemical Society, the American Physical Society and Phi Beta Kappa, and is a fellow of the American Institute of Chemists.

Heinrich E. Hunziker

Thomas J. Watson Research Center, Yorktown Heights, New York

Dr. Hunziker has been with IBM since 1967. His current interests as a staff member at the Research Center are in the application of spectroscopy to photochemical processes. He received his education in chemistry and physics from the Eidgenoessische Technische Hochschule in Zürich, where he obtained his Diploma in 1958 and a Ph.D. in 1964. He stayed there as a Research Assistant until 1965, and subsequently held a position as a Post-doctoral Research Associate at Brookhaven National Laboratory. He is a member of the American Physical Society and the American Chemical Society.

Hisashi Kobayashi

Thomas J. Watson Research Center, Yorktown Heights, New York

Since 1967 Dr. Kobayashi has been a research staff member in the communication sciences group at the Thomas J. Watson Research Center. His major field of specialization is communication and signal processing systems and his interests encompass related areas of systems theory. During the period of September 1969 through March 1970 he visited the Department of Systems Science at the University of California at Los Angeles. As an acting assistant professor he taught courses in probability theory, information theory and signal detection theory. He holds the B.S. and M.S. Degrees in Electrical Engineering, obtained in 1961 and 1963, respectively, from the University of Tokyo and the M.A. and Ph.D. Degrees in Electrical Engineering, both received in 1967 from Princeton University. He worked at the Toshiba Electric Company in Japan from 1963 to 1965, where he was engaged in research and development of advanced radar systems. He is a member of Eta Kappa Nu, IEEE and the Institute of Electrical Communication Engineers, Japan.

Hon-Chung W. Kwok

Research Division, San Jose, California

Mr. Kwok is a systems programmer in the Computer Facility Department at the Research Laboratory in San Jose. He has been with IBM since January 1966. Before he joined the systems group in March 1970, he was working

in the fluid mechanics group of the Large Scale Scientific Computation Department. During that period of time, he was working with W. E. Langlois on the general global circulation model. His education includes a B.A. from San Francisco State College, 1964 and an M.A. in Applied Mathematics in 1966 from the University of California. He worked as an application programmer at the Tidewater Corporation in the summer of 1965 and was a teaching assistant in statistics during his graduate studies. He is a member of the Mathematical Association of America, the Environmental Sciences Institute and the Association for Computing Machinery.

William E. Langlois

Research Division, San Jose, California

Dr. Langlois is currently a visiting professor of mathematics at Notre Dame University. He is on leave of absence from the Large Scale Scientific Computations Department of the IBM San Jose Research Laboratory, where he managed the Fluid Mechanics Group. His education includes an Sc.B. in Physics from Notre Dame, 1953, and a Ph.D. in Applied Mathematics from Brown University, 1957. He was a research engineer with DuPont from 1956 until 1959, at which time he joined IBM Research. He has been a part-time lecturer in physics at Santa Clara University since 1961. Dr. Langlois is a member of the Society for Natural Philosophy and the Environmental Sciences Institute. He is author of the book *Slow Viscous Flow*.

Charles P. Mignosa

Advanced Systems Development Division, Los Gatos, California

Mr. Mignosa is an Associate Chemist in an Advanced Technology Group at the laboratory in Los Gatos. He has been with IBM since 1966. He holds a B.S. degree from San Jose State College, 1968, and is currently pursuing an M.S. degree course at San Jose State College.

Roland M. Schaffert

*Formerly: Office Products Division, San Jose, California
Currently: 12771 Woodmont Drive, Saratoga, Calif. 95070*

Dr. Schaffert was a Senior Physicist in an advanced technology group at the Office Products Division Laboratory in San Jose and had been with IBM since 1956. He has now retired to become a consultant in electrophotography and electroprinting. His education includes an A.B. from Doane College, 1930, an M.S. in 1931 and a Ph.D. in Physics in 1933, both from the University of Cincinnati. He worked at the Sinclair Refining Co. in 1934, was an assistant professor of Physics at Duquesne University from 1934 to 1936 and a Research Physicist at the Mergenthaler Linotype Corp. from 1936 to 1941. He was on the staff of the Battelle Memorial Institute from 1941 to 1956, where he pioneered in research and development on xerography. He received the Certificate of Merit from the Office of Scientific Research and Development in 1946. Dr. Schaffert is a member of the American Physical Society, the Electrochemical Society, the Society of Photographic Scientists and Engineers, the Technical Association of Graphic Arts and the Research and Engineering Council of the Graphic Arts Industry. He is a Senior Member of the IEEE and a Fellow of the American Association for the Advancement of Science. He is a registered Professional Engineer and author of the book *Electrophotography*.

Rangaswamy Srinivasan

Thomas J. Watson Research Center, Yorktown Heights, New York

Dr. Srinivasan is a member of the Physical Sciences Department at the Research Center, working in photochemistry. He has been with IBM since 1961. His education includes a B.Sc. (Hons.) from Madras University, India, 1949; an M.S. from Madras University, India, 1950; and a Ph.D. from the University of Southern California in 1956. He was a Post-doctoral Fellow at the University of Rochester from 1957 to 1961, a visiting professor of Chemistry at City College of the City University of New York from 1963 to 1964, and a Guggenheim Fellow from 1965 to 1966. From 1966 to 1967 he was a professor of Chemistry at Ohio State University. Dr. Srinivasan was Chairman of the Gordon Conference on Photochemistry in 1967 and organized the Fifth International Conference on Photochemistry in 1969. He is a member of the American Chemical Society, Sigma Xi, Phi Lambda Upsilon and the A.A.A.S.

Marcel J. Vogel

Advanced Systems Development Division, Los Gatos, California

Mr. Vogel is an Advisory Chemist at the Los Gatos Laboratory where he is currently engaged in research on the application of liquid crystals to display systems. He received his B.S. in Chemistry in 1939 from the University of San Francisco. From 1941 to 1957 he was President and Director of Research of the Vogel Luminous Corporation where his research activities included the development of luminous materials such as printing inks, temperas and artists' oil colors. He joined IBM at the San Jose Research Laboratory in 1957. Mr. Vogel is a member of the Electrochemical Society, the Society of Biological Photographers, the American Chemical Society and RESA. He is coauthor with Peter Pringsheim of the book *Luminescence of Liquids and Solids and its Practical Application*.

Costantino S. Yannoni

Thomas J. Watson Research Center, Yorktown Heights, New York

Dr. Yannoni has been with IBM since 1967 as a member of the General Chemistry Group in the Research Center. He received an A.B. from Harvard College in 1957 and a Ph.D. in Chemistry from Columbia University in 1967. Before coming to IBM, he spent one year at the Union Carbide Research Institute in Tarrytown, New York. He is a member of the American Chemical Society and the American Physical Society.

William R. Young

Thomas J. Watson Research Center, Yorktown Heights, New York

Dr. Young is a staff member at the Research Center, where he has worked since 1967. He received his B.S. in 1964 from the Massachusetts Institute of Technology, where he won the American Institute of Chemists Award and the Alpha Chi Sigma Prize for outstanding promise and scholastic achievement in chemistry. He completed his academic training at the University of California, Berkeley, in 1967, earning his Ph.D. in Organic Chemistry. Since coming to IBM, Dr. Young's research interests have been in the fields of physical-organic chemistry and liquid crystals. He is a member of the American Chemical Society, Phi Lambda Upsilon and Sigma Xi.

Contents of previous two issues

September 1970

Vol. 14, No. 5

● *Papers on Holography:*

The Conference on Holography and the Computer by J. A. Jordan, Jr.	476
Some Effects of Fourier-domain Phase Quantization by J. W. Goodman and A. M. Silvestri	478
Incoherent Filtering Using Kinoforms by J. C. Patau, L. B. Lesem, P. M. Hirsch and J. A. Jordan, Jr.	485
Acoustic Holography with Crossed Linear Arrays by D. M. Milder and W. H. Wells	492
Structural-information Storage in Holograms by J. T. Winthrop	501
Laser Speckle and Its Elimination by D. Gabor	509
A Theory of Granularity and Bleaching for Holographic Information Recording by H. W. Lorber	515
Noise and Distortion in Photographic Data Storage by D. G. Falconer	521

Characteristics of Dielectric Holograms by J. Upatnieks and C. D. Leonard	527
High-efficiency Phase-hologram Gratings by A. Schmackpfeffer, W. Jarisch and W. W. Kulcke	533

● *Papers:*

A Statistical Mechanical Approach to Systems Analysis by A. E. Ferdinand	539
Moment Normalization of Handprinted Characters by R. G. Casey	548
Performance Equivalence of Suboptimally Controlled Nonlinear Systems by R. C. Durbeck	558
Concurrent Error Detection for Group Look-ahead Binary Adders by G. G. Langdon, Jr. and C. K. Tang	563