Authors

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Mr. Ahearn is in the Manufacturing Reasearch Laboratory, where he works on electro-optics and gaseous electronics. Until recently the laboratory was part of the System Products Division. Since joining IBM in 1964, he has worked on GaAs injection lasers for device development and systems applications. He also has investigated plasma properties of helium neon lasers and gas display panels. During 1963 and 1964, Mr. Ahearn worked for the Sylvania Company, Waltham, Massachusetts, on high power lasers for range finding applications and programs. Previously he had worked for RCA, Burlington, Massachusetts, on solid-state lasers and electro-optic systems. He received his B.A. in physics from Clark University, Worcester, Massachusetts, in 1960 and his M.S. in electrical engineering from New York University in 1970. Mr. Ahearn is a member of the Institute of Electrical and Electronics Engineers and the Society for Information Display.

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Miss Alessandrini is a research staff member in a physical sciences department at the Thomas J. Watson Research Center. Her current interests are in the crystal structure studies of oxidation, precipitation, diffusion, recrystallization, and kinetic reactions in thin films. Prior to joining IBM in 1960, she was a staff member at the General Electric Company Research Center in Schenectady, New York. She received her A.B. and B.S. degrees from Barnard College, Columbia University, New York, in 1943. Miss Alessandrini is a member of the American Crystallographic Association, the American Vacuum Society, and the Electron Microscope Society of America.

Joseph Angilello

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Mr. Angilello is in a physical sciences department at the Thomas J. Watson Research Center, where he joined IBM in 1963. His principal interest is in x-ray diffraction structures. Mr. Angilello is a member of the American Crystallographic Association.

Raymond G. Bayer

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Mr. Bayer is in a mechanics and metallurgy department at the Endicott development laboratory. He joined IBM in 1958 and has held a variety of positions in the areas of printer technology and materials. His principal activity has been in tribology. He obtained a B.S. in physics from St. John's University, Jamaica, New York, in 1956, and an M.S. in applied mathematics from Brown University, Providence, Rhode Island, in 1959. Mr. Bayer is coauthor of *Handbook of Analytical Design for Wear* and an editor of *Selection and Use of Wear Tests for Metals*, an ASTM Special Technical Publication. He has received two IBM Outstanding Contribution Awards, one for a friction and wear design approach and the other for a study of fatigue in welds.

Melvin Berkenblit

Research Division, Yorktown Heights, New York

Mr. Berkenblit is a research staff member in an exploratory silicon technology department within a semiconductor science and technology group, where he is currently engaged in etching and oxidation studies of silicon. He has been involved with the vapor growth of germanium and zinc oxide and with the etching of a variety of semiconducting and insulating materials. He joined IBM in 1954 at the Watson Laboratory at Columbia University in New York. He received a B.S. from the City College of New York in 1950 and an M.A. from Brooklyn College in 1959, both in chemistry. Mr. Berkenblit is a member of the American Chemical Society and the Electrochemical Society.

Vlasta Brusic

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Dr. Brusic joined IBM in 1970 and has worked since that time in the Manufacturing Research Laboratory on material/process characterization. Her principal interest is in the study of metallic corrosion and passivation processes. She received the B.S. in chemistry technology from the University of Zagreb, Yugoslavia, in 1962, and the Ph.D. in physical chemistry from the University of Pennsylvania in 1970. Dr. Brusic is a member of the American Association for the Advancement of Science, the Electrochemical Society, and Sigma Xi.

John G. Cahill

Research Division, Yorktown Heights, New York

Mr. Cahill is in the terminal technologies area of an exploratory terminal technology group at the Thomas J. Watson Research Center. He joined IBM at Research in 1963, and from then until 1969, he worked in the field of thin film and vacuum technology in a central scientific services group. From 1969 to 1971, he was in an equipment engineering area of the Components Division in East Fishkill, New York. Mr. Cahill returned to Research in 1971 working in a surface chemistry group on a cadmium selenide project until 1973. From then until 1977, he was in an exploratory materials group working on gas panels. Mr. Cahill has studied at the University of Bridgeport, Connecticut.

See Ark Chan

Research Division, Yorktown Heights, New York

Mr. Chan is in a semiconductor science and technology group at the Thomas J. Watson Research Center. He is currently studying the etching of silicon and polysilicon. He joined IBM in 1967 at Yorktown, where he has worked in gas panel fabrication processes. Mr. Chan received his B.S. in electrical engineering in 1974 and his M.S. in computer science in 1978, both from Polytechnic Institute of New York, Brooklyn.

Frank I. Chow

Data Systems Division, East Fishkill, New York

Mr. Chow joined IBM's System Products Division in 1977 at East Fishkill, where he is currently working in a support group for semiconductor manufacturing lines. As a graduate student prior to joining IBM, while in a collaborative program with the IBM System Products Division, Endicott, New York, he prepared a thesis on stress analysis of print characters. Mr. Chow received his B.S. in industrial engineering in 1976 and his M.S. in engineering in 1977, both from Cornell University, Ithaca, New York.

James J. Dempsey

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Mr. Dempsey, who joined the Thomas J. Watson Research Center in 1965, is presently engaged in studies concerning the preparation of thin films by various techniques and the correlation of film properties to film deposition parameters.

Francois M. d'Heurle

Research Division, Yorktown Heights, New York

Since joining IBM in 1958, Dr. d'Heurle has been working on the phenomena relating to thin metallic films, especially electromigration and diffusion. He received his B.S. in mechanical engineering from Arts Métiers, Paris, France, in 1946, his M.S. in metallurgical engineering from Michigan Technological University, Houghton, in 1948, and his Ph.D., also in metallurgical engineering, from the Illinois Institute of Technology, Chicago, in 1958. Dr. d'Heurle is a member of the American Institute of Mining, Metallurgical and Petroleum Engineers, the American Vacuum Society, the Electrochemical Society, the Federation of American Scientists, the French Engineers in the U.S.A., and the Institute of Electrical and Electronics Engineers.

Peter A. Engel

System Products Division, Endicott, New York

Dr. Engel is in a mechanics and metallurgy department at the Endicott laboratory. He joined IBM in 1968 after receiving his Ph.D. in theoretical and applied mechanics from Cornell University, Ithaca, New York. He received a B.E. from Vanderbilt University, Nashville, Tennessee, in 1958 and an M.S. from Lehigh University, Bethlehem, Pennsylvania in 1960, both in civil engineering. At IBM, his work has included investigations of mechanical response and failure, with emphasis on dynamic contact phenomena, impact and wear. Prior to joining IBM, he worked as a structural analyst with Praeger-Kavanagh-Waterbury in New York City from 1959 to 1962, and as a structures research engineer on the Saturn booster project with the Boeing Company in New Orleans, Louisiana, from 1962 to 1965. Dr. Engel is the author of *Impact Wear of Materials*. He is an adjunct staff member at the State University of New York at Binghamton. He is a member of the American Society of Mechanical Engineers.

Robert Hammer

Research Division, Yorktown Heights, New York

Mr. Hammer is presently working on gas panels at the Thomas J. Watson Research Center. He joined IBM in 1962 and has done research on several electronic devices, including light emitting diodes, injection lasers, and MOS logic and memory. Prior to joining IBM, he worked on communication systems with the U.S. Navy and Western Union. Mr. Hammer received his A.A.S. in engineering science from Westchester Community College, Valhalla, New York, in 1968.

Robert P. Havreluk

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Mr. Havreluk is in an exploratory silicon technology department at the Thomas J. Watson Research Center. He is currently working on the testing and characterization of advanced FET devices and the implementation of an automated testing system. In 1972 he graduated from the State University of New York at Farmingdale with an A.S. He joined IBM in 1974 after receiving a B.S. in electrical engineering from the New York Institute of Technology. Mr. Havreluk is a member of the Institute of Electrical and Electronics Engineers.

David C. Heath

Cornell University, Ithaca, New York

Dr. Heath is an assistant professor in the School of Operations Research and Industrial Engineering at Cornell University. Prior to 1974, he was an assistant professor in the School of Mathematics at the University of Minnesota, Minneapolis. He received his A.B. in 1964 from Kalamazoo College, Michigan, and his M.S. in 1965 and his Ph.D. in 1969 from the University of Illinois, all of which were in mathematics. Dr. Heath is a member of the American Mathematical Society, the Institute of Mathematical Statistics, the Mathematical Association of America, and Sigma Xi.

Conrad Lanza

Research Division, Yorktown Heights, New York

Mr. Lanza is a member of an electro-optical semiconductor device group at the Thomas J. Watson Research Center and is currently working on solar cell devices and solar concentrators. Since joining IBM in 1959, his research has included studies of gas panel displays, tunnel diodes, semiconductor injection lasers, and Gunn effect devices. From 1953 to 1959 he was employed by Raytheon, Boston, where he worked on transistorized pulse-position-modulation communication systems; and from 1947 to 1953 he was involved in the development of radio aids to navigation while with Hazeltine Laboratories, Little Neck, Long Island. Mr. Lanza received the B.S. in electrical engineering from the Polytechnic Institute of Brooklyn in 1947 and the M.S. in electrical engineering from Northeastern University, Boston, in 1956.

Siriphong Lawphongpanich

The Johns Hopkins University, Baltimore, Maryland

Mr. Lawphongpanich received his B.S. in 1976 and his M.Eng. in 1977 in operations research and industrial engineering from Cornell University, Ithaca, New York. He is currently a Ph.D. student in the Department of Mathematical Sciences at The Johns Hopkins University. His research interests lie in the application of mathematical programming to operations research problems.

Robert D. MacInnes

Data Systems Division, Yorktown Heights, New York

Mr. MacInnes is in the Manufacturing Research Laboratory and is currently active in the electrochemical study of thin films under corrosive conditions. He joined IBM's Research Division in 1970 in a radiotracer laboratory. Mr. MacInnes received a B.A. in biology in 1973 from Hartwick College in Oneonta, New York.

John F. O'Hanlon

Research Division, Yorktown Heights, New York

Dr. O'Hanlon is in an electroluminescent materials group at the Thomas J. Watson Research Center, where he is studying vacuum deposition of phosphors. He joined IBM at the Poughkeepsie Product Development laboratory in 1957 and transferred in 1958 to the Research Division, where he was a member of a superconductivity department. He investigated plasma anodization and the ZnO-plasma display from 1968 to 1973. From 1973 to 1977 he was engaged in characterizing the ac gas display panel. He received the A.A.S. degree from the State University of New York at Farmingdale in 1957, the B.S. in electrical engineering and the M.S. from the University of Arizona, Tucson, in 1962 and 1963, and the Ph.D. in physics in 1967 from Simon Fraser University, Vancouver, Canada. Dr. O'Hanlon is a member of the American Vacuum Society, the Electrochemical Society, Tau Beta Pi, and is a senior member of the Institute of Electrical and Electronics Engineers.

K. C. Park

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Dr. Park is presently program director of display technology. In recent years he has worked on gas panel display technology. He received a B.S. and a Ph.D. in chemistry from the University of Minnesota in 1957 and 1967, an Sc.M. from the Massachusetts Institute of Technology, Cambridge, in 1961, and an M.B.A. from New York University in 1978. From 1962 to 1966 he was associated with the Honeywell Research Center, where he was responsible for a group investigating optical and electrical properties of thin films. He joined IBM in the Systems Development Division in 1967 and since 1968 he has been working at the Research Center on memory and display technologies. Dr. Park is a fellow of the American Institute of Chemists, a member of the American Chemical Society, the Society of Information Display, and Beta Gamma Sigma.

Alfred Phillips, Jr.

Data Systems Division, East Fishkill, New York

Dr. Phillips is a member of a computer aided device design department in East Fishkill, where he joined IBM in 1968. His current technical interests include heavy doping and hot electron modeling. Dr. Phillips received a B.S. in physics from Loyola University of Chicago and an M.S. and a Ph.D., also in physics, from Howard University of Washington, D.C., in 1964 and 1968. He is a member of the American Physical Society, the Institute of Electrical and Electronics Engineers, and Sigma Xi.

Rhodes W. Polleys

General Products Division, Tucson, Arizona

Mr. Polleys is assigned to the sensor and tribology department at the Tucson laboratory with interests in materials science and engineering, especially magnetic recording heads and media. Currently, he is working at the San Jose Research laboratory on a sabbatical assignment in the area of advanced magnetic recording media. He joined IBM in 1951 at Poughkeepsie, New York, in technical services, moving to an advanced media development department in 1959. In 1968–1969, he completed a year as a Fellow in the Practicing Engineer Program at the Center for Advanced Engineering Study at the Massachusetts Institute of Technology, Cambridge. Mr. Polleys earned a B.S. in chemical engineering from Yale University, New Haven, Connecticut, in 1947. He is a member of the American Electroplaters Society, the American Society for Testing and Materials, the Electrochemical Society, and the Scientific Research Society of America. Mr. Polleys holds five U.S. patents in magnetic materials.

Arnold Reisman

Research Division, Yorktown Heights, New York

Dr. Reisman is currently a manager of an exploratory silicon technology department within semiconductor science and technology and has been with IBM since 1953 when he joined the staff of the Watson Laboratory at Columbia University working on ferroelectric materials. From 1958 to the present he has worked in research programs on photoconductivity, semiconductors, subnanosecond technology, bistable resistor materials,

FET technology, and advanced gas panel technology at the Poughkeepsie and Yorktown research centers. He received his B.S. in chemistry from City College of New York, his M.A. in physical chemistry from Brooklyn College, and his Ph.D. in physical chemistry from the Polytechnic Institute of Brooklyn. Dr. Reisman is an associate editor of the *Journal of Electronic Materials*. He is a fellow of the American Institute of Chemists and a member of the New York Academy of Sciences, the American Institute of Mining, Metallurgical, and Petroleum Engineers, the Electrochemical Society, and Sigma Xi. Dr. Reisman is author of the book *Phase Equilibria*.

David D. Roshon

System Products Division, Endicott, New York

Mr. Roshon joined IBM in 1953 at the Endicott product development laboratory. From 1954 to 1971, he was a member of a physical technology department where he worked in various fields, including photoelasticity, heat transfer, magnetics, wear and optics. He is currently in a mechanics and metallurgy group in the materials laboratory. He has been involved in work on wear by paper and wear resistant materials as well as serving as a consultant on metals applications. He is a 1953 graduate of the University of Buffalo, New York, with a B.S. in mechanical engineering. Mr. Roshon is a member of the American Society for Metals. He holds five patents and has received two IBM Invention Achievement Awards.

Omesh Sahni

Research Division, Yorktown Heights, New York

Dr. Sahni is in an exploratory display technologies group at the Thomas J. Watson Research Center, where he is currently working on thin film electroluminescent devices for display applications. His other technical interests are in the field of gaseous electronics. He joined IBM's Research Division in 1972 and has worked on gas discharge display devices. He received an M.S. in physics in 1960 from the Banaras Hindu University, India, and another M.S. in electrical engineering in 1962 from the Indian Institute of Technology, Bombay. From 1962 to 1967, he was a member of the faculty of electrical engineering at the Indian Institute of Technology. In 1967 and 1968, he did research in France at the Center for Nuclear Studies, Saclay, and the Laboratory for Plasma Studies, Orsay. He came to Rensselaer Polytechnic Institute, Troy, New York, in 1969 and received a Ph.D. in electrophysics in 1972. Dr. Sahni is a member of the American Physical Society, the Institute of Electrical and Electronics Engineers, the Society for Information Display, and Sigma Xi.

Michael Sampogna

Research Division, Yorktown Heights, New York

Mr. Sampogna is presently working in a packaging and multilevel metals area at the Thomas J. Watson Research Center. He joined the Research Division in 1962, working in exploratory materials until 1969, when he transferred to the System Products Division laboratory at East Fishkill, New York, where he worked in a photoprocessing technology area and MST manufacturing support. In 1971 he returned to Research to work on gas panel displays. He received his B.S. from City College of New York in 1969 and his M.S. from Vassar College, Poughkeepsie, New York, in 1972, both in physics. Mr. Sampogna is a member of the American Vacuum Society.

Eugene S. Schlig

Research Division, Yorktown Heights, New York

Mr. Schlig is a member of an I/O technologies department at the Thomas J. Watson Research Center. He joined IBM in 1956 at the Watson Laboratory at Columbia University in New York City and has worked on various aspects of digital circuits, electron devices, and displays. He received a B.S. in electrical engineering from the City College of New York in 1956 and an M.S. in electrical engineering from Columbia University in 1961.

George R. Stilwell, Jr.

System Communications Division, Research Triangle Park, North Carolina

Mr. Stilwell is in an optical communications development department. He joined IBM in 1951 at the development laboratory in Endicott, New York. He transferred to the Thomas J. Watson Research Center, Yorktown Heights, New York, and worked on the development of electronic weighing systems and managing the development and release of digital computers. He received the B.S. in electrical engineering from Lehigh University, Bethlehem, Pennsylvania, in 1951 and attended the graduate school of Syracuse University, New York. Mr. Stilwell is the author of numerous patents including the A-B-B Parallel Tone Transmission System, which has been adopted as an international standard.

Elizabeth J. Weitzman

Boulder, Colorado

Mrs. Weitzman was an associate engineer in a thin film area at the Thomas J. Watson Research Center, Yorktown Heights, New York. She had joined IBM in 1970 and worked on various thin film materials studies and on gas panels. She received her B.A. in chemistry in 1969 from Ithaca College, New York, and her M.S. in metallurgy in 1973 from New York University. She retired from IBM in 1974 to pursue family interests.