Authors

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Mr. Ahearn is in the Manufacturing Research Laboratory, where he works on electro-optics and gaseous electronics. 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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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.

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Dr. Chance is a senior engineer currently engaged in the design, fabrication and analysis of gas devices and interconnection support structures for semiconductor devices. He received the B.S., M.S., and Ph.D. degrees in engineering science from the University of California, Los Angeles, in 1959, 1960 and 1963. He was research assistant from 1959 to 1962 and Ramo Foundation Fellow 1962–1963 working in the area of photoeffects at solid-electrolyte interfaces. In 1963 he joined IBM Components Division at Poughkeepsie and was engaged in high speed tunnel diode development. Subsequently he had various assignments on joining technology for silicon devices and the development of multilayer ceramic and glass for component packaging. Dr. Chance is a member of the American Society of Mechanical Engineers and Sigma Xi.

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Mr. Chastang is a staff engineer in the Manufacturing Research Laboratory. He has been with IBM since 1970 and has worked in optics, high speed photography, metrology, and laser development. He previously worked at the French Atomic Energy Commission, Saclay, in 1965 and at the Laboratoire de Recherches Balistiques et Aérodynamiques, Vernon, in 1966. In 1967 he joined the Itek Corporation, where he worked on research and development in interferometry and optical testing. His education includes an M.S. from the Faculty of Sciences and an Ingenieur-Opticien diploma from the Institute of Optics, received from the University of Paris in 1963 and 1965.

William T. Chen

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Dr. Chen is a senior engineer in Endicott laboratory's technical operations function. He joined an advanced technology group in IBM in 1963 at Endicott. From 1963 to 1973 he held a variety of positions in mathematical methods and mechanical analysis. In 1974 he was promoted to electrical analysis laboratory manager and in 1977 was named to his present post in mechanics and metallurgy. Dr. Chen received a B.S. in mechanical engineering from the University of London in 1958, an M.S. in mechanical engineering from Brown University, Providence, Rhode Island, in 1962, and a Ph.D. in applied mechanics from Cornell University, Ithaca, New York, in 1963.

James P. Considine

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Dr. Considine is a research staff member working on the problems of data management in large computing systems. He has been with IBM in the Research Division since 1966, during which time he has been involved in a number of projects aimed at making computing systems more accessible to the general user. He spent 1973 at the IBM United Kingdom Scientific Centre at Peterlee, joining in the development of a relational data base system, the Peterlee Relational Test Vehicle (PRTV). Between 1975 and 1977 at the Thomas J. Watson Research Center, he helped develop the prototype of the IBM Hierarchical Storage Manager Program Product. He continues to be involved with projects designed to enhance the usability of data storage and data storage devices. Dr. Considine received the B.S. degree from Manhattan College in New York City in 1957 and the Ph.D. degree from the Polytechnic Institute of Brooklyn in 1962, both in chemistry. He is a member of the American Association for the Advancement of Science and the Association for Computing Machinery.

Vincent S. Crawford

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Mr. Crawford is currently involved in studies relating to the understanding and design parameters of vacuum chip joining at the Manufacturing Research Laboratory. He joined IBM in Brooklyn, New York, in 1970. From then until he joined the Research Division in 1974, he worked on the design of test equipment. At Research, he studied the effects of design fabrication variables relating to the life and reliabilities of gas lasers. Prior to joining IBM, he was employed by the Clairex Corporation, Mt. Vernon, New York, working on experimental and theoretical studies of evaporated semiconductor CdSe and CdS photoelectric cells and their design, construction and electrical test parameters along with manufacturing support. Mr. Crawford received an A.S. in electrical technology, physics, mathematics, and electronics in 1971 from Queensborough Community College, Bayside, New York. In 1974 he obtained his B.S. in electrical technology from the City College of New York. At present he is doing graduate work at Fairleigh Dickinson University, Rutherford, New Jersey.

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Dr. Dave is a staff member at the Palo Alto Scientific Center where his current technical interests include modeling of radiation transfer in the atmosphere with application to the use of solar energy and the effect of pollutants on climate. He joined IBM in 1967, having previously worked as a research assistant at the Physical Research Laboratory, Ahmedabad, India, from 1949 to 1957, and as a visiting assistant professor and research physicist in the Department of Meteorology, University of California, Los Angeles, from 1957 to 1960. He also worked as a research assistant in the Department of Meteorology, Imperial College, London, England from 1960 to 1962. Dr. Dave was a program scientist at the National Center for Atmospheric Research, Boulder, Colorado from 1962 to 1967, and an affiliate associate professor in the Department of Meteorology, Florida State University, Tallahassee, from 1966 to 1968. His education includes a B.S. in physics and mathematics in 1948, an M.S. in physics in 1952, both from the Bombay University, India, and a Ph.D. in physics in 1957 from the Gujurat University, India. He is coauthor of the books *Tables Related to Radiation Emerging from a Planetary Atmosphere with Rayleigh Scattering* and *Scattered Radiation in the Ozone Absorption Bands at Selected Levels of a Terrestrial, Rayleigh Atmosphere*.

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Dr. Franaszek is a member of the computer sciences department at the Thomas J. Watson Research Center. His interests include analytical problems associated with storage hierarchies, magnetic recording, and digital communications. He received the B.Sc. degree from Brown University, Providence, Rhode Island, in 1962, and the M.A. and Ph.D. degrees from Princeton University, New Jersey, in 1964 and 1965. During the academic year 1973 to 1974, he was on sabbatical leave at Stanford University, California, as a Consulting Associate Professor of Electrical Engineering and Computer Science. Prior to joining IBM in 1968, he was a member of the technical staff at Bell Telephone Laboratories. Dr. Franaszek is a member of Sigma Xi, Tau Beta Pi, and the Institute for Electrical and Electronics Engineers.

Herm J. Greenberg

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Dr. Greenberg joined IBM in 1971 at the Research laboratory in San Jose, where his primary technical interests have been directed toward mathematical modeling and computer simulation of mechanical systems. He is currently serving a one year sabbatical assignment at the IBM General Products Division, Santa Teresa Laboratory, where he is working on computer systems architecture. He received a B.S. in engineering mechanics in 1964, an M.S. in theoretical and applied mechanics in 1965, both from the University of Illinois, Urbana, and a Ph.D. in applied mechanics in 1968 from the University of California at Berkeley.

Richard E. Horstmann

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Mr. Horstmann is a member of the Manufacturing Research Laboratory located at the Thomas J. Watson Research Center. His current interest as a materials bonding specialist is in the packaging of nozzles for ink jet printers. He joined IBM Research, then in Poughkeepsie, New York, in 1957 and worked in the infancy of superconducting digital logic. Since then, he has contributed to a task force on aluminum electromigration, an ongoing program in magnetic bubble memories, and conducted an investigation of the manufacturing of HeNe lasers. He was formerly employed by Columbia University, New York, as a laboratory assistant to several doctoral candidates in the geochemistry department. Mr. Horstmann received his B.S. in electrical engineering in 1964 from Fairleigh Dickinson University, Rutherford, New Jersey. He received an IBM Outstanding Invention Award in 1969 for his work in copper aluminum electromigration and was recognized by NASA in 1975 for a publication on magnetic bubbles. Mr. Horstmann is a member of the Institute of Electrical and Electronics Engineers.

Ting C. Huang

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Dr. Huang is in a crystallography and microstructure group of an applied sciences department, where he joined IBM in 1973. He is responsible for the characterization of materials using x-ray diffraction and x-ray fluorescence for chemical analysis. His main research interest is in the development of x-ray and profile-fitting computer methods for fast and precise data acquisition and reduction. He received a B.S.E.E. degree and an M.S.E.E. degree, both from the Cheng-Kung University, Taiwan, in 1964 and 1966. He came to the United States in 1968 and received an M.S. in physics from C. W. Post College of Long Island University, 1969. He obtained his Ph.D. degree from Polytechnic Institute of Brooklyn in 1972. Afterward, he spent one year as a Postdoctoral Fellow at IBM in Burlington, Vermont. Dr. Huang is a member of the American Crystallographic Association and the Joint Committee on Powder Diffraction Standards. In 1974, Dr. Huang was co-recipient of an IBM Outstanding Contribution Award on "Automated X-Ray Powder Diffraction Analysis."

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Dr. Langdon is a member of the San Jose Research laboratory working in compression of image data. He received the B.S. in electrical engineering from Washington State University in 1957, the M.S. in electrical engineering from the University of Pittsburgh in 1963, and the Ph.D. in electrical engineering from Syracuse University in 1968. He joined IBM in 1963 at the Endicott development laboratory where he did logic design work on small computers. In 1965 he received an IBM Resident Study Fellowship. During the academic year 1971-1972 he was in Brazil as a Visiting Professor at the University of Sao Paulo. He is the author of *Logic Design: A Review of Theory and Practice* and coauthor of *Projeto de Sistemas Digitais*. Dr. Langdon is a member of the Association for Computing Machinery and a senior member of the Institute of Electrical and Electronics Engineers.

Robert O. Lussow

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Dr. Lussow is presently manager of a group developing substrates for MLC packaging. After joining IBM in 1965, he worked on gas laser development, gas panel display development, photolithography, and etching technology developments. He received his Ph.D. in solid state technology from the Pennsylvania State University, University Park, in 1966. Dr. Lussow is a Fellow of the American Institute of Chemists, and a member of the American Association for the Advancement of Sciences, the New York Academy of Sciences, Phi Lambda Upsilon, and Sigma Xi.

Robert D. MacInnes

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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.

Carl W. Nelson

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Prior to retirement on March 1, 1977, Dr. Nelson was a senior engineer at the Endicott laboratory. He joined IBM at Endicott in 1959 and worked on the theory of friction and wear, static stress and deflection analysis, transient stresses in plates and bars, and thermal stresses and displacements in mechanical components and assemblies. He earned a B.S. in electrical engineering in 1934, a B.S. in engineering mathematics in 1934, an M.S. in engineering mathematics in 1934, and a Ph.D. in engineering mathematics in 1939, all from the University of Michigan. Before coming to IBM, he worked on railway engineering problems relating mostly to steam locomotives at the Timken Roller Bearing Company, Canton, Ohio, from 1939 to 1941. He held appointments as Assistant Professor of Mathematics at Texas Christian University, Ft. Worth, and Assistant/Associate Professor of Engineering Design at the University of California, Berkeley, from 1946 to 1959. Dr. Nelson is a member of the American Society of Mechanical Engineers and Sigma Xi.

Nicholas Pippenger

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Dr. Pippenger joined IBM in 1973 at the Thomas J. Watson Research Center, where he is a member of a mathematical sciences department. His main interest is in the theory of communication and computation. From 1969 through 1972 he was at the MIT Instrumentation Laboratory (now the Charles Stark Draper Laboratory), where he worked on the Apollo and Minuteman projects. In 1978 he was on sabbatical leave as Visiting Associate Professor in the Computer Science Department at the University of Toronto, Canada. He received his B.S. in natural science from Shimer College, Mt. Carroll, Illinois, in 1965, and the B.S., M.S., and Ph.D. in electrical engineering from the Massachusetts Institute of Technology, Cambridge, in 1967, 1969, and 1973. He is a member of the Association for Computing Machinery, the Institute for Electrical and Electronics Engineers, and the Society for Industrial and Applied Mathematics.

Martin A. Reed

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Mr. Reed is a senior associate engineer currently involved in satellite communications controller development. He joined IBM in 1974 as a member of a Kingston system performance evaluation group, where he developed queuing models for distributed systems analysis. He received a B.S. degree in electrical engineering in 1973, an M.S. degree in electrical engineering in 1974, and an M.S. degree in operations research and statistics in 1978, all from Rensselaer Polytechnic Institute, Troy, New York. Mr. Reed is a member of the Institute of Electrical and Electronics Engineers and Eta Kappa Nu.

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Dr. Rissanen is a member of a computer science department at the IBM Research laboratory in San Jose. He joined IBM in 1960 at the IBM Nordic Laboratories, Stockholm, Sweden, and transferred to the Research laboratory in San Jose in 1965. He spent the year 1973-74 at Linkoping University, Sweden, as Professor of Control Engineering. His current research interests are in combinatorial information theory, algebraic system theory, and estimation problems in time series. He received the Doctor of Technology Degree in control theory and mathematics in 1965 from Helsinki Institute of Technology, Finland.

Terence D. Smetanka

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Mr. Smetanka is a senior associate programmer working on developing a detailed queuing analysis of the TCAM (Telecommunications Access Method) software product. He first joined IBM in 1974 as a member of the Kingston system performance evaluation group, where he concentrated on simulation and mathematical modeling of display systems. He received his B.S. degree in mathematics from the University of Toledo, Ohio, in 1974 and will obtain his M.B.A. in 1979 from Duke University, Durham, North Carolina. Mr. Smetanka is a member of Phi Kappa Phi, Pi Gamma Mu, and Pi Mu Epsilon.

Arnold Weinberger

Data Systems Division, Poughkeepsie, New York

Mr. Weinberger is a senior engineer in a high-speed processor design area. Since he joined IBM in 1960, his interests have included general-purpose logic and methodology, arithmetic logic, and applications of LSI to logic. Prior to joining IBM, he was with the National Bureau of Standards, Washington, DC, working on the designs of the SEAC, DYSEAC, and PILOT computers. Among his 16 inventions are included the high-speed adder known as the carry-look-ahead adder and the use of 2-bit input decoders for PLAs. After receiving his B.S. in electrical engineering from City College of New York in 1950, he continued graduate studies at the University of Maryland, College Park. He is a senior member of the Institute of Electrical and Electronics Engineers.