Authors

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Dr. Av-Ron joined IBM at the East Fishkill facility in 1968, working on electron transport in metals. Currently he is working in the area of electrical properties in dielectrics. He received his B.S. in 1966 and his M.S. in 1968, both in physics, from Fairleigh Dickinson University, Teaneck, New Jersey. He received his Ph.D. in 1977, in materials science, from the Polytechnic Institute of New York, Brooklyn. Dr. Av-Ron is a member of the American Physical Society.

Erich Berndlmaier

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Mr. Berndlmaier is presently an advisory engineer working on VLSI process and circuit development for potential product leverage. His current interests are the identification and value association of new process and circuit concepts, such as chip multi-level metal processes, circuit delay regulation, and the development of algorithms to enhance wireability of VLSI circuits. He joined IBM in 1961 at Poughkeepsie, New York. His previous work assignments included test equipment engineering, developing manufacturing test equipment for SLT and MST products, and process product support, which covered silicon processing to packaging. He received a B.S. in 1961 from Brooklyn Polytechnic Institute, New York, and an M.S. in 1972 from Syracuse University, both in electronic engineering. Mr. Berndlmaier is a member of the Institute of Electrical and Electronics Engineers and a member of the executive committee of its Mid-Hudson section.

Joseph Z. Chen

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Mr. Chen joined the IBM Components Division in 1962. He worked in SLT circuit and module development for the IBM System/360, and followed this with designs for the SLD circuit families. He was responsible for the introduction of a 500-bit ROS with Schottky barrier diodes in MST technology in 1969 and a 1K-bit Schottky array ROS for IBM System/370 in 1970. He has also worked in the areas of lithographic tools, multi-layer ceramic designs, and process equipment engineering. He has been involved in high-density bipolar logic circuit and chip design since 1976, and is currently manager of bipolar products development, engaged in VLSI circuit design. Mr. Chen received his B.S. and M.S. in electrical engineering from the University of Illinois, Urbana, in 1960 and 1962.

William Chin

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Mr. Chin joined IBM in 1962 in Poughkeepsie, New York, and is now an advisory engineer in East Fishkill. His technical interests have been in FET memory and bipolar logic and memory circuit design. He is currently engaged in high-density bipolar gate array design. He received his B.S. in 1961 and his M.S. in 1962 in electrical engineering from the University of Illinois. Mr. Chin is a member of the Institute of Electrical and Electronics Engineers.

Allan H. Dansky

General Technology Division, East Fishkill, New York

Mr. Dansky is a senior engineer in Advanced Applications, where he is currently working on new, high-speed VLSI circuits. He received the B.S. in electrical engineering from the City College of New York in 1960 and the M.S. in electrical engineering from Syracuse University in 1969. Prior to joining IBM at Poughkeepsie, New York, in 1964, he worked for RCA in Princeton, New Jersey, on solid state circuits for television. From 1964 to 1969, he was responsible for the design of MST and SMT circuits, including formulation of application rules and product test approvals. During the early 1970s, he held management positions in Component Development in Poughkeepsie's Machine Technology and Functional Products areas and was responsible for technology evaluation and bipolar logic circuit design. He joined the products design function in 1974 and was responsible for logic circuit test strategy and product test planning for LSI. In 1975, he became manager of Low-End Extensions and later Microprocessor Design, where the design of the IBM 370 microprocessor was initiated. Mr. Dansky is a member of Eta Kappa Nu and the Institute of Electrical and Electronics Engineers.

Wilm E. Donath

Research Division, Yorktown Heights, New York

Dr. Donath joined IBM in 1959 and for the past ten years has worked primarily on problems connected with design automation at the Thomas J. Watson Research Center. He received a B.S. degree in chemical engineering from the Carnegie Institute of Technology in Pittsburgh and a Ph.D. in chemistry from the University of California at Berkeley. He is a member of the Institute of Electrical and Electronics Engineers, Sigma Xi, and the Society for Industrial and Applied Mathematics.

Jack Arthur Dorler

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Mr. Dorler is presently a senior technical staff member working in current products advanced technology in the area of circuit and chip design. He joined the IBM Components Division in Poughkeepsie, New York, in 1962, and has since held assignments in the circuit design of bipolar ROS, logic, and microprocessor chips in several IBM circuit technologies, including MST and its subsequent extensions. From 1960 to 1962, he worked for Bell Telephone Laboratories on switching systems equipment layout. Mr. Dorler has received two IBM Outstanding Contribution Awards, the first for a transistor sorting method in 1969 and the second for the introduction of Schottky barrier diodes into MST products. He also received a Data Systems Division Award in 1978 for his contributions to IBM System 303X circuit technology, and has been awarded ten United States patents.

Evon C. Greanias

Research Division, Yorktown Heights, New York

Mr. Greanias is a senior manager at the Thomas J. Watson Research Center. In this position, he is responsible for research into new applications of computer systems. Office systems are one of his current interests. He joined IBM in 1952 and has spent most of his career in research and development activities. He was an early developer of technologies for optical and magnetic ink character recognition. He has managed programs in medical electronics and medical information systems. Mr. Greanias was appointed an IBM Fellow in 1967 and joined the Research Division in 1974. He received his B.S. in engineering physics from the University of Illinois in 1944 and his M.S. in physics from the Illinois Institute of Technology in 1951.

J. K. Hassan

General Technology Division, East Fishkill, New York

Mr. Hassan is presently manager of lithography systems and technology tools at the East Fishkill laboratory. He is responsible for directing development of e-beam lithography tools, materials, and processes, as well as tool technology in areas such as ion implantation, reactive ion etching, and automated assembly/packaging processes. He joined IBM's Data Systems Division in 1968 at the East Fishkill laboratory. Mr. Hassan received his B.S. in mechanical engineering in 1962 from the University of Kerala, India, and an M.S. in material science and engineering in 1968 from the University of Bridgeport, Connecticut. He has received two IBM Outstanding Innovation Awards and two Invention Achievement Awards.

Joseph Hutt, Jr.

General Technology Division, East Fishkill, New York

Mr. Hutt joined IBM in 1966 in Poughkeepsie, New York. He is working in the physical design area of design automation of computer system development. This work has included placement and wiring of FET and STL designs. He is currently a staff programmer developing a form level automatic wiring program for advanced technology application. Mr. Hutt received his B.S. in electrical engineering from Union College, Schenectady, New York, in 1976. He is a member of the Institute of Electrical and Electronics Engineers.

Teh-Sen Jen

General Technology Division, East Fishkill, New York

Dr. Jen joined IBM in 1964 in Poughkeepsie, New York, and is now a senior engineering manager of product development in East Fishkill. His past experience involved MST, advanced bipolar, and FET logic/memory development. He has received over ten U.S. patents in the field of LSI circuits and devices and five IBM Invention Achievement Awards. In his current position he manages the design and product engineering activities of cost performance-oriented logic products. He received his B.S. in 1960 from the National Taiwan University, Taiwan, and his Ph.D. in 1968 from Carnegie-Mellon University, Pittsburgh, Pennsylvania, both in electrical engineering. Dr. Jen is a member of the Institute of Electrical and Electronics Engineers.

Walter J. Kleinfelder

Data Systems Division, Poughkeepsie, New York

Dr. Kleinfelder joined IBM in 1961 at the Poughkeepsie, New York, laboratory and is currently a senior engineer in the Advanced Systems Engineering Department. He has worked in various areas involving the development and manufacturing of semiconductor devices and in the circuit technology and design of large computing systems since that time. He received his B.S. in electrical engineering from Rensselaer Polytechnic Institute, Troy, New York, in 1961, an M.S. from Syracuse University in 1964, and his Ph.D. in electrical engineering from Stanford University in 1967. Dr. Kleinfelder was awarded the IBM Outstanding Contribution Award for his work in semiconductor manufacturing processes and was also a recipient of the IBM Data Systems Division Award. He received an IBM Resident Study Fellowship in 1964 for study at Stanford University and has been an adjunct staff member of IBM's Systems Research Institute since 1969. Dr. Kleinfelder is a member of Eta Kappa Nu, Tau Beta Pi, Sigma Xi, and the Institute of Electrical and Electronics Engineers.

Huey Ling

Research Division, Yorktown Heights, New York

Dr. Ling is a manager in the Computer Sciences Department at the Thomas J. Watson Research Center. He joined IBM in 1965 at the Research laboratory in San Jose, California. Recently he was with the forecasting group at Data Processing Product Group headquarters, White Plains, New York. He received his B.Sc. from the National Taiwan University in 1957, his M.Sc. from the University of New Brunswick in 1961, and his Ph.D. in electrical engineering from the University of Oklahoma in 1965. Dr. Ling was a method supervisor with Bell Telephone of Canada in 1961, an electronics engineer with Sundstrand Aviation, Denver, Colorado, from 1962 to 1963, and an assistant professor at Florida State University in 1965. Dr. Ling is a member of the Association for Computing Machinery and the Institute of Electrical and Electronics Engineers.

Joseph C. Logue

System Communications Division, Kingston, New York

Mr. Logue joined IBM in 1951 from a position as Assistant Professor of Electrical Engineering at Cornell University. During Mr. Logue's thirty-year career with IBM, he has been responsible for the circuits used in IBM's 7000 series machines, for large system designs such as Stretch and the IBM Models 91 and 95, tape drives such as Tractor and Hyper, displays such as GEM and large memories. Mr. Logue guided IBM into integrated circuits and LSI and conceptualized complex multilayer ceramic packages. Recently he has developed PLAs and their use in VLSI custom chip designs. In 1971, he was appointed an IBM Fellow. Mr. Logue received a B.S. in 1944 and an M.S. in 1949, both in electrical engineering from Cornell University. He is the recipient of two IBM Outstanding Innovation Awards for a special transistor circuit in 1964 and a PLA laser personalization in 1980. Mr. Logue is a member of the American Association for the Advancement of Science, Eta Kappa Nu, the Institute of Electrical and Electronics Engineers, where he is an IEEE Fellow, Phi Kappa Phi, the Scientific Research Society of America, and Sigma Xi.

Paul Lowy

System Communications Division, Kingston, New York

Mr. Lowy is an advisory engineer in the FET custom design department. He joined IBM's Advanced Systems Development Division, Poughkeepsie, New York, in 1959. Since 1973, he has contributed to various LSI design projects in the areas of logic design, technology support, and performance verification. His current interest is automatic checking of custom designs. He obtained a B.S. in engineering from Stevens Institute of Technology, Hoboken, New Jersey, in 1959 and an M.S. in electrical engineering from New York University in 1966. He is a Professional Engineer and a member of the Institute of Electrical and Electronics Engineers.

Joseph M. Mosley

General Technology Division, East Fishkill, New York

Mr. Mosley is a staff engineer in advanced applications, currently engaged in the development of new circuits for both logic and arrays. His earlier assignments included circuit design on a 1K-byte memory and the design of the personalization of logic designs which are used on the IBM 3033 machines. He joined IBM in East Fishkill in 1969, after receiving a B.S. in electrical engineering from the University of Bridgeport, Connecticut. Mr. Mosley is a member of the Institute of Electrical and Electronics Engineers.

J. Randal Moulic

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Mr. Moulic joined IBM in 1973 at the Poughkeepsie development laboratory. He has worked on surface acoustic wave devices and is currently investigating the use of lasers in semiconductor technology. Mr. Moulic received a B.S. in electrical engineering in 1972 and an M.S. in 1973 from the University of Illinois. Mr. Moulic is a member of the Institute of Electrical and Electronics Engineers.

John A. Paivanas

General Technology Division, East Fishkill, New York

Dr. Paivanas is an advisory engineer in fluid mechanics, heat transfer, and mechanical technology at the General Technology Division development laboratory in East Fishkill. His academic background includes a B.S. and an M.S. in mechanical engineering from the University of Buffalo, New York, and a Ph.D. in engineering mechanics from the State University of New York at Buffalo. Prior to joining IBM in 1968, he was employed from 1955 to 1968 by the Union Carbide Corporation, where he was engaged in research and development in cryogenics, high vacuum technology, and aerothermodynamics. He holds patents in the areas of cryogenic processes and fluid mechanics equipment. At the University of Buffalo, he served as a research associate and as an instructor in fluid mechanics. Dr. Paivanas is a member of the American Association for the Advancement of Science, the American Institute of Aeronautics and Astronautics, the American Society of Mechanical Engineers, and Sigma Xi.

Glenn A. Ritter

General Technology Division, East Fishkill, New York

Mr. Ritter joined IBM in 1968 after graduating from Ryder Technology, Allentown, Pennsylvania, with a major in electronics technology. For about eight years, he has been active in bipolar chip design, including design of the main logic masterslices used in the IBM 3033 CPU. Mr. Ritter was promoted to technical associate in 1979 and recently has been designing arrays using CTS memory cells.

Richard O. Seeger

General Technology Division, East Fishkill, New York

Mr. Seeger joined IBM in 1965 as a customer engineer in the Office Products Division in New York City, after receiving his A.A.S. in electrical engineering from Voorhees Technical Institute, New York. Following military and educational leaves of absence, Mr. Seeger transferred to the Data Systems Division in East Fishkill. In 1969 he received his B.S. in electrical engineering (*cum laude*) from the New York Institute of Technology. Mr. Seeger received his M.S. in electrical engineering from New York University in 1974 and his M.B.A. from Marist College, Poughkeepsie, New York, in 1978. He is an advisory engineer working on advanced bipolar RAM design concepts. His past experience includes work on monolithic MSI bipolar logic, bipolar RAM and bubble memory programs.

Morris Shatzkes

General Technology Division, East Fishkill, New York

Dr. Shatzkes is an advisory physicist in the process modeling and device physics department at the East Fishkill facility. He joined IBM in 1957 at Vestal, New York, in the area of radiation effects. From 1965 to 1968, he participated in an IBM educational sabbatical program to obtain his Ph.D. in physics from Syracuse University, New York, having received his B.S. in physics from the City College of New York in 1956, and his M.S. in physics from Syracuse University in 1963. He returned to IBM at East Fishkill to do development work in the advanced materials and technology department. His current interests are in the electrical properties of thin metal films and charge transport and electrical breakdown in insulators. Dr. Shatzkes is a member of the American Physical Society.

James R. Struk

General Technology Division, East Fishkill, New York

Mr. Struk is a development engineer and manager of high-performance bipolar RAM circuit and chip design. After graduation from RCA Institutes, New York, he joined the Components Division, Poughkeepsie, New York, in 1963, working in solid logic technology development. He received a B.S. in electrical engineering from Polytechnic Institute of New York in 1967, returning to IBM in monolithic systems technology logic circuit design. After further logic design assignments in MST-extensions and Dutchess, Mr. Struk became responsible for the design and analysis of several bipolar Harper cell array products, including a 256 × 9 static RAM. Mr. Struk is a member of Eta Kappa Nu.

Albert W. Vinal

System Communications Division, Research Triangle Park, North Carolina

Mr. Vinal is a senior engineer in the Signal Processing, Switching, and Transmission Department. He joined IBM in the Federal Systems Division in 1956 and worked in the solid state memory technology area until 1973, when he joined the Raleigh mission. Since then, he has worked on machine-readable magnetic coding technologies which include solid state and semiconductor scanner techniques. Mr. Vinal received an IBM Outstanding Invention Award for his work in the area of solid state nonvolatile memories. From 1948 to 1954, before coming to IBM, he worked at the Massachusetts Institute of Technology as a technician and engineer. He received a B.S. from the Massachusetts Institute of Technology in 1954 and an M.S. from Syracuse University in 1970, both in electrical engineering. Mr. Vinal is a member of the Institute of Electrical and Electronics Engineers.

Stephen D. Weitzel

General Technology Division, East Fishkill, New York

Mr. Weitzel is a senior associate engineer in the products design group at East Fishkill. In 1974 he received a B.S. in electrical engineering from Pennsylvania State University, University Park, and was elected to Eta Kappa Nu, Phi Kappa Phi, and Tau Beta Pi. He joined IBM in East Fishkill, where his work assignments included designing microprocessor-controlled product handlers and product test engineering. Presently Mr. Weitzel is working on logic and array circuits for VLSI.

Wei-Wha Wu

System Communications Division, Kingston, New York

Mr. Wu is a senior engineer and manager of laser development and integrated circuit diagnostics at the Kingston laboratory. He joined IBM at the Thomas J. Watson Research Center in 1962 and while there worked on semiconductor device modeling and memory circuits. He transferred to Poughkeepsie in 1965 and worked on the MST circuits for the IBM System/360 Models 85 and 195. He was also involved in LSI circuit designs, processing, and testing. In 1973, Mr. Wu was on the staff of IBM Fellow Joseph C. Logue and was involved in small systems, high-performance array logics, and programmable macroprocessors. In 1978, he transferred to Kingston and had responsibilities for laser personalization and bipolar PLA developments. He received an IBM System Communications Division Award for this work in 1980. Mr. Wu received a B.S. in 1957 from the National Taiwan University and an M.S. in 1962 from the University of Cincinnati, both in electrical engineering. From 1957 to 1959, he was manager of the Electronics Division at Ta-Tung Electric Corporation, Taipei. From 1959 to 1961, he was a teaching assistant in the Department of Electrical Engineering, National Taiwan University. Mr. Wu has received three IBM Invention Achievement Awards for semiconductor devices, circuits, and subsystems. He is a member of the Institute of Electrical and Electronics Engineers.

Ernesto F. Yhap

Research Division, Yorktown Heights, New York

Dr. Yhap is a member of the automatic programming group in the Computer Sciences Department at the Thomas J. Watson Research Center, where he is involved with experimental compiler systems. His previous research activities included work in design automation, microprogramming systems, and advanced system architecture. He joined IBM in 1958 at the Product Development laboratory in Poughkeepsie, where he worked on advanced technology semiconductor devices and from 1959 to 1965 was with the Advanced Systems Development Division, Mohansic, New York, where he worked extensively in digital communications, data multiplexing, and data concentration systems. He transferred to the Research Division in 1965. From 1972 to 1973, while on a Research Division sabbatical, Dr. Yhap was assigned to an advanced systems planning group at IBM World Trade Headquarters, White Plains, New York. His education includes B.S., M.S., and E.E. degrees in electrical engineering from Stanford University and a Ph.D. in mathematics from the Courant Institute of Mathematics, New York University. He is a senior member of the Institute of Electrical and Electronics Engineers and a member of the American Mathematical Society, the Association for Computing Machinery, and the Institute of Mathematical Statistics.