

Authors

John A. Armstrong

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

A.B., 1956, Harvard College; Ph.D. in Applied Physics, 1961, Harvard University. Post Doctoral Fellow in Applied Physics, 1961-62, Harvard University. Joined IBM in 1963 at the Research Center. Research interests include nonlinear optics, quantum noise in lasers, and holography.

Paul T. Chang

Systems Development Division, Poughkeepsie, New York

M.S. in Physics, 1956, University of Michigan. Previously employed in research and development by Curtiss Wright Corp. and Daystrom Inc. Joined IBM in 1961 to work in an advanced optics group at the Poughkeepsie laboratories. Most recently employed in the area of advanced recording technology, working on problems involving beam interactions with magnetic materials. Has been on educational leave since September 1965 at Syracuse University for an advanced degree in physics. Member, RESA.

George T. Czaykowski

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

B.A. in Applied Mathematics, 1961; M.A., 1966, Trinity College, Cambridge. Attended postgraduate year in fluid mechanics at Cambridge. In 1962 joined IBM Development Laboratory, Hursley (England) to work on the design and implementation of scientific compilers. Transferred to Research Center in 1964 and is now on leave studying towards a D.Phil. at Queens College, Oxford.

Charles E. Hasty

Systems Development Division, San Jose, California

B.S.M.E., 1961, University of Texas; M.S.M.E., 1962, Stanford University. Joined IBM at San Jose in June 1962 to work with the mechanical reliability group. At the time of writing he was a senior associate engineer with the same group in the Systems Development Division. He is at present enrolled in a Ph.D. course in Mechanical Engineering at Stanford University on an IBM resident fellowship. Member, Tau Beta Pi and Phi Eta Sigma.

Chung You Ho

Components Division, Burlington, Vermont

B.S.M.E., 1956, Taiwan National University; M.S.M.E., 1959, University of Texas; Ph.D., 1962, Rensselaer Polytechnic Institute. Was with the Bendix Corporation in 1962. Joined IBM in 1963 to work in the Scientific Computation department of the Systems Development Division laboratory at Rochester. In 1964-65 was also Assistant Professor of Applied Mathematics at St. Mary's College, Winona, Minn. Currently Staff Systems Analyst at Burlington where he is investigating techniques for computer control of the SLT manufacturing process. Member, Sigma Xi, AAAS, ASME, IEEE and the Mathematical Association of America.

David P. Kennedy

Components Division, East Fishkill, New York

Member of Radiation Laboratory, MIT, 1940-42, engaged in the design of radar equipment. From 1942-58 was employed by Raytheon Manufacturing Company to work in the fields of microwave tubes, microwave communication systems, and semiconductor devices. Instructed at the Graduate School of Engineering, Northeastern University, 1953-58. Joined the IBM Development Laboratory, Data Systems Division, Poughkeepsie, in 1958 as an Advisory Physicist in the mathematical analysis of boundary value problems relating to the design and development of semiconductor devices. Is currently a Senior Physicist and Manager of Mathematical Analysis, Semiconductor Device Theory at the East Fishkill laboratory. Member, American Physical Society.

Guenter Knauff

Systems Development Division, Boeblingen, Germany

B.S. in Electrical Engineering, Technical College, Esslingen, Germany. Joined IBM Germany in 1956 as a customer engineer. During 1958-61 worked as product engineer and is now doing development work at the Boeblingen laboratory.

Herbert J. Kump

Systems Development Division, Burlington, Vermont

B.S. in Physics, 1951, Pennsylvania State University; M.E.E., 1960, Syracuse University. Joined IBM at Endicott in 1955 where he worked in the magnetic recording and storage fields. Later, was engaged in the development of a magnetic thin film memory in the Data Systems Division at Poughkeepsie and is now working on the development of advanced magnetic memory systems at the Burlington laboratory.

Helmut Lamparter

Systems Development Division, Boeblingen, Germany

M.S. in Electrical Engineering, 1959, Technical University, Stuttgart, Germany. Joined IBM in 1959 at the Boeblingen laboratory, where he is now working on System/360 Model 20 tape support.

John R. Morrison

Systems Development Division, Boulder, Colorado

A.A.S. in Physics, 1961, Dutchess Community College; B.S. in Physics, 1963, Marist College; later attended Syracuse University Graduate School of Physics. Joined IBM in 1961 at Poughkeepsie where he was primarily concerned with magnetic tape development. Currently working in the recording physics section of the Advanced Technology department in the Boulder laboratory.

Redmond R. O'Brien

Components Division, East Fishkill, New York

B.S. in Mathematics, 1953; M.S. in Mathematics, 1954; and Ph.D. in Mathematics, 1957, Massachusetts Institute of

Technology. Joined Sylvania Electric in 1958 as a member of the Operations Research and Mathematical Analysis Department of the Applied Research Laboratory. Worked on communication and detection problems on noisy environments. Joined IBM in 1960, to work on the theoretical analysis of semiconductor devices and associated computational problems. Member, Sigma Xi, American Mathematical Society, Mathematical Association of America, and American Statistical Association.

William A. Pliskin

Components Division, East Fishkill, New York

B.S. in Physics, 1941, Kent State University; M.S. in Physics, 1943, Ohio University; and Ph.D. in Physics, 1949, Ohio State University. Fellow at Ohio State University, 1948-49. Was a research physicist at Texaco Research Center, working on fundamental catalysis studies such as molecular surface structures determined by the infrared spectra of chemisorbed molecules. Joined IBM in 1959 at Poughkeepsie and has been engaged in structure and application studies of oxide and glass systems for surface passivation of silicon devices. Presently is manager of special studies of oxides and insulators at the East Fishkill laboratory. Member, Sigma Xi, Pi Mu Epsilon, Sigma Pi Sigma, American Physical Society, American Chemical Society, Electrochemical Society, and RESA; Senior Member, IEEE.

J. Frank Potts

Systems Development Division, San Jose, California

B.S.M.E., 1963, Texas Technological College. Joined IBM at San Jose in 1963 to work with the mechanical reliability group. He is at present taking leave of absence from the Systems Development Division to complete his M.S.M.E. at Stanford University. Member, Tau Beta Pi, Phi Kappa Phi, Phi Beta Sigma.

Archibald W. Smith

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

B.Sc. in Physics, 1951, University of Alberta; Ph.D., 1955, University of Toronto. Was engaged in research on ferromagnetism and lasers at the Defense Research Telecommunications Establishment, Ottawa, 1956-62. Joined IBM at the Research Center in 1962, and worked in the fields of nonlinear optics and laser modulation. Is currently studying noise in gas and injection lasers. Member, American Physical Society.

Dennis E. Speliotis

Systems Development Division, Boulder, Colorado

B.S. in Electrical Engineering, 1955, University of Rhode Island; M.S. in Electrical Engineering, 1957, M.I.T.; Ph.D. in Solid State Physics, 1961, University of Minnesota. From 1957-59 he taught at M.I.T. and worked at A. K. Kusko Consultants and IBM Research Laboratory on magnetic thin films. Joined IBM at Poughkeepsie in 1961, where he has worked on hard magnetic films and magnetic recording. Presently manager of advanced recording technology at the Boulder laboratory.

Wilhelm G. Spruth

Systems Development Division, Boeblingen, Germany

Ph.D. in Electrical Engineering, 1957, Technical University, Aachen. Assistant Professor of Electrical Engineering, Carnegie Institute of Technology, Pittsburgh, 1957-59. Joined IBM at the Advanced Systems Development Division laboratory in Mohansic, 1959, and transferred to the Boeblingen laboratory, 1961. Member, IEEE and ACM.

Iradj G. Tadjbakhsh

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

B.S., 1954, University of Maryland; M.S., 1955, University of Michigan; Ph.D., 1959, Rensselaer Polytechnic Institute. In 1960 he became a temporary member at the Courant Institute of Mathematical Sciences and was an Assistant Professor of Mechanics at R.P.I. from 1960-61. Joined IBM in 1961 at the Research Center and has been working in mechanics and applied mathematics. Member, RESA, SIAM, AMS, AAS, and the International Society of Engineering Science.

Yih-O Tu

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

B.S. in Ordnance Engineering, 1946, College of Ordnance Engineering, China; M.S. in Mechanical Engineering, 1954, Carnegie Institute of Technology; Ph.D. in Mathematics, 1959, Rensselaer Polytechnic Institute. Joined IBM at the Research Center and has been studying continuum mechanics since 1959. Member, American Mathematical Society, American Physical Society, Society of Industrial and Applied Mathematics, American Society of Mechanical Engineers, and Sigma Xi.

• *Articles:*

Solution of the Partial Differential Equations Describing Photodecomposition in a Light-absorbing Matrix having Light-absorbing Photoproducts by <i>C. E. Herrick, Jr.</i>	2
Calculations of Impurity Atom Diffusion through a Narrow Diffusion Mask Opening by <i>D. P. Kennedy and P. C. Murley</i>	6
Design Technique for High-Efficiency Frequency Doublers Based on the Manley and Rowe Energy Relations by <i>E. M. Rutz-Philipp</i>	13
Computation of Ion Trajectories in the Monopole Mass Spectrometer by Numerical Integration of Mathieu's Equation by <i>R. F. Lever</i>	26
* On the Design and Performance of a Small 60-nsec Destructive Readout Magnetic Film Memory by <i>W. Anacker, G. F. Bland, P. Pleshko, and P. E. Stuckert</i>	41
On Measures of Logic Performance: Logic Quantum, Factor, and Figure of Merit by <i>L. J. Giacoletto</i>	51

Some Experiments in Spoken Word Recognition by <i>J. H. King, Jr. and C. J. Tunis</i>	65
--	----

• *Letter to the Editor:*

An Experiment in Cluster Detection by <i>J. E. Dammann</i>	80
---	----

• *Short Communications:*

The Dispersion Locked Memory Mode for Magnetic Films by <i>H. J. Kump, H. G. Hottenrott, B. I. Bertelsen, and P. T. Chang</i>	89
Dynamic Thermal Response and Voltage Feedback in Junction Transistors by <i>F. A. Reid</i>	95
Conditions for Termination of the Method of Steepest Descent after a Finite Number of Iterations by <i>W. E. Langlois</i>	98

* *Addendum*

Page 48: The word driver circuit shown in Figure 7 was designed by Mr. Wei W. Wu, of the IBM Systems Development Division, Poughkeepsie, New York. The authors regret that specific acknowledgment of Mr. Wu's contribution was not made at the time of publication.