

## Contributors



**Edward G. Cristal** (S'58 - M'61 - SM'66) was born in St. Louis, Mo., on January 27, 1935. He received the B.S. and A.B. degrees in electrical engineering and mathematics in 1957, and the M.S. degree in electrical engineering in 1958 from

Washington University, St. Louis, Mo. In 1961 he received the Ph.D. degree in electrical engineering from the University of Wisconsin, Madison.

He joined the staff of the Electromagnetic Techniques Laboratory of the Stanford Research Institute, Menlo Park, Calif., in 1961, and has since been engaged in applied research and development of microwave and UHF components.

Dr. Cristal is a member of the Scientific Research Society of America.



**A. N. Datta** was born in Chandernagore, West Bengal, India, in 1941. He received the B.Sc. degree in physics in 1961 and the B.Tech. and M.Tech. degrees in radio physics and electronics in 1963 and 1965, respectively, from the

University of Calcutta, Calcutta, India.

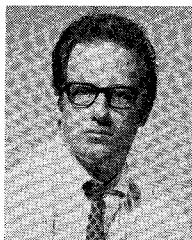
In 1965 he became a Research Fellow at the Solid State Electronics Laboratory, the Institute of Radio Physics and Electronics, University of Calcutta, India. Since January, 1968, he has been working as a Research Associate in the Center of Advanced Study in Radio Physics and Electronics at the University of Calcutta. He has been engaged in the study of the transport properties of artificial dielectrics and semiconductors at microwave frequencies. His research interest has also been in the study of the Faraday effect in inhomogeneous media.



**James W. Gewartowski** (S'53-M'57-SM'63) was born in Chicago, Ill., on November 10, 1930. He received the B.S. degree in electrical engineering from Illinois Institute of Technology, Chicago, in 1952, the S.M. degree in electrical engineering from Massachusetts Institute of Technology, Cambridge, in 1953, and the Ph.D. degree in electrical engineering from Stanford University, Stanford, Calif., in 1958.

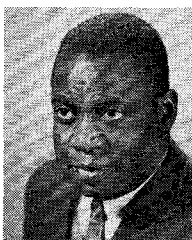
From 1954 to 1957 he was a Research Assistant at the Stanford Electronics Laboratory, engaged in fundamental research on backward-wave oscillators. Since 1957 he has been a member of the technical staff at Bell Telephone Laboratories, Murray Hill, N. J. From 1957 to 1962 he was engaged in research and development on high-power traveling-wave tubes, crossed-field amplifiers, and electron guns. From 1962 to the present he has been Supervisor of the Microwave Source Group, concerned with circuit applications of varactor diodes and IMPATT diodes. He is co-author of the books *Principles of Electron Tubes* and *Introduction to Electron Tubes* (Van Nostrand, 1965 and 1969).

Dr. Gewartowski is a member of Tau Beta Pi, Eta Kappa Nu, and Sigma Xi. In 1960 he received the Browder J. Thompson Memorial Prize Award of the IEEE.



**Dennis L. Gish** (S'68-M'69) was born in Los Angeles, Calif., on August 3, 1941. He received the B.S., M.S., and Ph.D. degrees from the University of California, Los Angeles, in 1964, 1966, and 1968, respectively.

For the academic year 1968 to 1969, he served as an Acting Assistant Professor for the U.C.L.A. Engineering Department where he is now serving as a Research Engineer working on underwater acoustic wave scattering problems.



**Odell Graham** (S'60-M'62) was born in Chicago, Ill., on March 31, 1931. He received the B.S. degree in applied physics in 1961 and the M.S. degree in engineering in 1967, both from the University of California, Los Angeles. He is currently studying for the Ph.D. degree in electrical engineering under a Howard Hughes doctoral fellowship at UCLA.

He joined Hughes Aircraft Co., Culver City, Calif., in 1954, where he was engaged in electromechanical design and microwave

component development for the early Falcon missiles. From 1960 to 1961 he was employed by Hycon Manufacturing Co., where he was engaged in the design and development of strip transmission line microwave components. He returned to Hughes Aircraft Co. in 1961, and is currently a Project Engineer in the Missile Systems Division where he is engaged in the analysis and design of strip transmission line and microwave integrated circuits.



**Tatsuo Itoh** (S'69-M'69) was born in Tokyo, Japan, on May 5, 1940. He received the B.S. and M.S. degrees in electrical engineering from the Yokohama National University, Yokohama, Japan, in 1964 and 1966, respectively, and the

Ph.D. degree in electrical engineering from the University of Illinois, Urbana, in 1969.

Before coming to the United States in September, 1966, he held a teaching position at Tamagawa University, Tokyo, Japan. From September, 1966, to February, 1969, he was a Research Assistant in the Antenna Laboratory of the University of Illinois, where he is now a Research Associate. His research has been on open resonators, quasi-optical gratings, waveguide discontinuity problems, and microstrip transmission lines.

Dr. Itoh is a member of the Institute of Electronics and Communication Engineers of Japan.



**Raj Mittra** (S'54-M'57-SM'69) received the Ph.D. degree in electrical engineering from the University of Toronto, Toronto, Canada, in 1957.

He taught at Pennsylvania State University, University Park, from 1956 to 1957, and also worked in their Ionosphere Research Laboratory. From 1965 to 1966 he was a Guggenheim Fellow at Oxford University, Oxford, England. He was appointed to the Center for Advanced Study of the University of Illinois, Urbana, in 1968 where he currently holds the position of Professor of Electrical Engineering. He has held summer positions with the University of Colorado, Boeing, Hughes Aircraft Company, Bell Telephone Laboratories, and TRW Systems,

and has acted as a Consultant to a number of industrial organizations.

Dr. Mitra is a member of Sigma Xi and Commission VI of the International Scientific Radio Union.



**James E. Morris** (A'61-M'69) was born in New York, N. Y., on December 17, 1934. He attended the University of Michigan, Ann Arbor, from 1953 to 1955.

From 1955 to 1959 he served in the U. S. Navy and was engaged in radar maintenance. He joined Bell Telephone Laboratories, Whippany, N. J., in 1959, where he worked on microwave stripline receiving, filtering, and switching circuits. Since transferring to Bell Telephone Laboratories, Murray Hill, N. J., in 1963, he has been engaged in the design of high-speed pulse circuits and microwave integrated hybrid phase shifters. He is currently in the Solid-State Device Electronics Department and is investigating the properties of IMPATT diodes and circuits.



**B. R. Nag** was born in Comilla (now East Pakistan), on October 1, 1932. He received the B.Sc. degree (with honors) in physics in 1951, the M.Sc. (Tech.) degree in radio physics and electronics in 1954, and the D.Phil. degree in 1961, all from the

University of Calcutta, Calcutta, India. He also received the M.S. degree in electrical engineering from the University of Wisconsin, Madison, in 1960.

From 1954 to 1955 he was at the Electronics Laboratory of the Indian Statistical Institute, Calcutta. He joined the staff of the Institute of Radio Physics and Electronics, Calcutta, as a Lecturer in 1956 and became a Reader in 1964. Since 1968 he has been a Professor in the Centre of Advanced Study in Radio Physics and Electronics, University of Calcutta, India. His research interests have been in the fields of electronic computers, nonlinear phenomena in electronic oscillators, microwave propagation in semiconductors and artificial dielectrics, hot-electron transport in semiconductors and ionized media, and solid-state devices based on the Gunn effect and acoustoelectric interaction. He

has published approximately 80 papers in international journals.

Dr. Nag is a Fellow of the IERE (England).



**Risaburo Sato** (SM'62) was born in Furukawa City, Miyagiken, Japan, on September 23, 1921. He received the B.E. and Ph.D. degrees from Tohoku University, Japan, in 1944 and 1952, respectively.

From 1949 to 1961 he was an Assistant Professor at Tohoku University. Since 1961 he has been a Professor at the same school. His research interests are in the areas of network theory, communication systems, active transmission-line theory, and antenna theory. He is author of the books, *Transmission Circuit*, *An Introduction to the Design of Passive Network*, and *Electrical Communication Engineering* (all in Japanese).

Dr. Sato is a member of the Institute of Electrical Communication Engineers of Japan.