

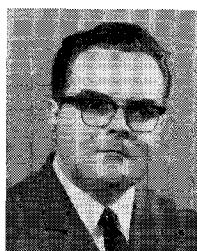
# Contributors



**Charles A. Burrus, Jr.** (SM'63) was born in Shelby, N. C., on July 16, 1927. He received the B.S. degree, cum laude, from Davidson College, Davidson, N. C., in 1950, the M.S. degree from Emory University, Atlanta, Ga., in 1951, and the Ph.D. degree from Duke University, Durham, N. C., in 1955, all in physics. At Duke University he studied under Texas Company and Shell Company fellowships.

He was employed as a Research Associate at Duke University from 1954 to 1955. In 1955 he joined the Technical Staff of the Bell Telephone Laboratories, Inc., Holmdel, N. J. His work has been concerned primarily with the millimeter- and submillimeter-wave region of the spectrum; microwave spectroscopy and various types of varactor, tunnel, backward, avalanche-oscillator, and harmonic generating diodes for millimeter-wave use.

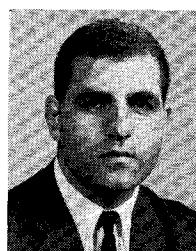
Dr. Burrus is a member of Phi Beta Kappa, Sigma Pi Sigma, Sigma Xi, the American Physical Society, and the American Association for the Advancement of Science.



ing, mainly physical area of interest, besides teaching, has been research in the fields of electromagnetic theory and parametric devices.

tion on the subject of parametric amplification in periodic structures with application at decimeter wavelengths.

Since 1961, he has been an Assistant at the same Institute teaching fundamentals of electrical engineer-electronics. His main



celerators. In 1958, he joined the Electron Physics Laboratory, where he has been engaged in research on masers, parametric amplifiers, detectors, electron-beam devices, and microwave solid-state devices. He held a University of Michigan Research Institute Fellowship for the academic year of 1958-1959, and a sponsored research fellowship for the spring semester of 1959-1960. He served as an Instructor in the Electrical Engineering Department from 1960 to 1963, an Assistant Professor from 1963 to 1965, and is presently an Associate Professor and Director of the Electron Physics Laboratory.

Dr. Haddad is a member of Eta Kappa Nu, Sigma Xi, Phi Kappa Phi, and the American Physical Society.

Robert S. Elliott, (S'46-A'52-SM'54-F'61) was born in Brooklyn, N. Y., on March 9, 1921. He received the A.B. degree in English literature and the B.S.E.E. degree from Columbia University, New York, N. Y., in 1942 and



1943, respectively, and the M.S. and Ph.D. degrees from the University of Illinois, Urbana, in 1947 and 1952, respectively.

He was with the Applied Physics Laboratory of the Johns Hopkins University for three years and at the University of Illinois from 1946 to 1952, where he was an Assistant Professor. He was with the U. S. Navy in 1952 on a missile development program, and with the Hughes Research Laboratories as head of their antenna research activities, including work on surface-wave antennas and arrays from 1953 to 1956. In 1956, he helped found the Rantec Corporation and served as its Vice President and Technical Director. Since 1958, he has been Professor of Engineering at the University of California, Los Angeles, and is also a Consultant to the Hughes Aircraft Company. His specialties include electromagnetic theory and the electrical properties of materials.

Dr. Elliott is a member of Sigma Xi, Tau Beta Pi, and the New York Academy of Sciences. He is also the author of a recently published textbook *Electromagnetics*, which is concerned with special relativity and electromagnetic theory.

Mark K. Krage (S'65) was born in Cayuga, Ontario, Canada, on July 16, 1943. He received the B.S.E.E. and B.S. degrees in mathematics, in 1965, from the University of Michigan, Ann Arbor.

He is presently working toward the M.S.E.E. degree, and is employed as a Research Assistant in the Electron Physics Laboratory at the University of Michigan.

Mr. Krage is a member of Eta Kappa Nu.



Hans-Jürgen Butterweck (M'61) was born in Gevelsberg/Westfalen, Germany, on June 23, 1932. He received the Diplom-Ingenieur and the Ph.D. degree from the Technological University of Aachen, Germany, in 1956 and

1959, respectively.

In 1962 he became a lecturer there in the Department of Electrical Engineering, where he was concerned with research on microwaves and network theory. From 1964 to 1967 he was a member of the technical staff of the Philips Research Laboratories, Eindhoven, The Netherlands, where he was engaged in work on quantum electronics and electromagnetic wave propagation. In 1967 he joined the Technological University of Eindhoven, where he is a Professor of Electrical Engineering.

Dr. Butterweck is a member of the Nachrichtentechnische Gesellschaft (NTG) and the Nederlands Elektronica- en Radiogenootschap (NERG).

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**J. Borges DaSilva** was born in Lisbon, Portugal, on May 10, 1934. He received the Engineer Degree in electrical engineering and the Engineering Diploma from the Instituto Superior Técnico of Lisbon Technical University in 1958 and 1961, respectively. He is currently finishing work for a doctoral disserta-



Tien Pei Lee (S'61-M'64) was born in Nanking, China, on September 8, 1933. He received the B.S. degree in electrical engineering from National Taiwan University, Taiwan, China, in 1957, the M.S. degree in electrical engineer-

ing from the Ohio State University, Columbus, in 1959, and the Ph.D. degree from Stanford University, Stanford, Calif., in 1963.

From 1959 to 1963, he worked on a millimeter-wave backward wave oscillator at the Hansen Microwave Laboratory, Stanford University, as a research assistant. He joined Bell Telephone Laboratories, Inc., in 1963, and worked on solid-state microwave varactor diodes and photodiodes. His present interests are millimeter-wave harmonic generators, IMPATT diode oscillators, and optical photodiode mixers.

Dr. Lee is a member of Sigma Xi.

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**George I. Haddad** (S'57-M'61-SM'66) was born in Aindara, Lebanon, on April 7, 1935. He received the B.S.E., M.S.E., and Ph.D. degrees in electrical engineering in 1956, 1958 and 1963, respectively, from the University of Michigan, Ann Arbor.

From 1957 to 1958 he was associated with the Engineering Research Institute of the University of Michigan, where he was engaged in research on electromagnetic ac-