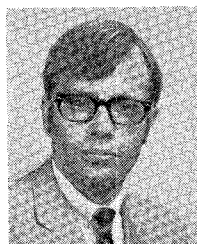


- wave irradiation," in *Proc. 4th Tri-Service Conf. Biological Effects of Microwave Radiation*. New York: Plenum, 1961, p. 251.
- [10] R. D. McAfee, "Neurophysiological effects of microwave irradiation," *Proc. 3rd Tri-Service Conf. Biological Effects of Microwave Radiating Equipment*, Aug. 1959, p. 315.
- [11] C. von Euler, "Selective response to thermal stimulation of mammalian nerves," *Acta Physiol. Scand.*, vol. 14, suppl. 45, 1947.

- [12] J. W. Howland, R. A. E. Thomson, and S. Michealson, "Biomedical aspects of microwave irradiation of mammals," *Proc. 4th Tri-Service Conf. Biological Effects of Microwave Radiation*. New York: Plenum, 1961, p. 261.
- [13] R. S. Katz, "The interaction of anesthetic agents and adrenergic drugs to produce cardiac arrhythmias," *Anesthesiology*, vol. 29, 1968, p. 763.
- [14] R. D. McAfee, "Microwave stimulation of the sympathetic nervous system," *Biomed. Sci. Instrum.*, vol. 1, 1963, p. 167.

## Contributors



**George E. Anderson** (S'63-M'64) was born in Bellingham, Wash., January 24, 1941. He received the B.S.E.E. degree from the University of Washington, Seattle, in 1963.

He received his commission in the U. S. Public Health Service upon graduation and worked for one and a half years in the Technical Operations Branch, Bureau of Radiological Health, as an Instrument Evaluation and Systems Design Engineer and then for one and a half years as Deputy Chief of the

Radiation Surveillance Network. He subsequently worked for three years in the area of Bioengineering Physics for the Division of Biological Effects. He is currently Chief of the Dosimetric Studies Section, Division of Biological Effects.



**Harold L. Bassett** (S'58-M'60) was born in Dunn, La., on August 29, 1932. He received the B.S. degree in electrical engineering from the Louisiana Polytechnic Institute, Ruston, in 1959 and the M.S. degree in physics from Rollins College, Winter Park, Fla., in 1967.

From 1959 until 1967 he was on the staff of the Research Division, Martin-Marietta Company, Orlando, Fla., where he was engaged in research on microwave components and antennas. He joined the staff of Georgia Institute of Technology, Atlanta, Ga, in 1967, where he has worked on focused microwave systems and microwave radome and materials measurement instrumentation.

Mr. Bassett is a member of Tau Beta Pi.



**Leo Birenbaum** (S'45-A'48-M'53-SM'70) was born in New York, N. Y., on December 1, 1927. He received the B.E.E. degree from the Cooper Union, New York, N. Y., in 1946, and the M.E.E. degree from the Polytechnic Institute of Brooklyn, Brooklyn, N. Y., in 1958.

After spending two years in the U. S. Navy as an Electronics Technician, from 1948 to 1951 he was an Electronics Engineer at the New York Naval Shipyard. Since 1951 he has been with the Polytechnic Institute of Brooklyn as a Research Associate. He has done research in the areas of microwave components and transmission lines, and on the biological effects of microwaves. At present, he is also engaged in the teaching of electrical engineering. He holds a number of patents in microwave devices.

Mr. Birenbaum is a member of Tau Beta Pi, Sigma Xi, the American Association for the Advancement of Science, and the International Microwave Power Institute.



**Ronald R. Bowman** was born in Berea, Ky., on August 27, 1930. He received the B.S. degree in engineering physics from the University of Colorado, Boulder, in 1955, and has done graduate study in applied mathematics and physics.

While attending graduate school, he worked for the U. S. Geological Survey, Geophysics Branch, Denver, Colo. In 1957 he joined the staff of the National Bureau of Standards, Boulder, Colo., where he has worked on microwave power and frequency stability, microwave attenuation, and microwave horn gain. He is currently a Project Leader in the Electromagnetic Fields Standards Section. One of his recent projects has developed theory, instrumentation, and techniques for measuring hazardous electromagnetic fields.



**Russell L. Carpenter** was born on November 7, 1901, in Meriden, Conn. He received the B.S. degree from Tufts University, Medford, Mass., in 1924, and the Ph.D. degree from Harvard University, Cambridge, Mass., in 1928.

From 1928 to 1938, he was, successively, Instructor and Assistant Professor of Anatomy at the College of Physicians and Surgeons, Columbia University, New York, N. Y. In 1938, he was appointed Professor of Zoology at Tufts University and served in that post until he became Professor Emeritus in 1968. From 1956 to 1968, he was Director of the Tufts Microwave Radiobiology Laboratory, studying the biological effects of microwave radiation under a contract with the Air Research and Development Command, U. S. Air Force, from 1956 to 1962, and under a grant from the Institute of General Medical Sciences, U. S. Public Health Service, from 1962 to 1968. In 1969 he was appointed Consultant and in 1970, Research Biologist, at North-eastern Radiological Health Laboratory, Bureau of Radiological Health, U. S. Public Health Service, where he is directing a program of research on the interaction of microwaves and biological tissues.

Dr. Carpenter is a Fellow of the American Academy of Arts and Sciences and a member of the International Microwave Power Institute, International Federation for Medical and Biological Engineering, Association for Research in Ophthalmology, American Association of Anatomists, American Society of Zoologists, Phi Beta Kappa, and Sigma Xi.



**H. Allen Ecker** (S'55-M'58) was born in Athens, Ga., on October 22, 1935. He received the B.E.E. and M.S.E.E. degrees from Georgia Institute of Technology, Atlanta, in 1957 and 1959, respectively, and the Ph.D. degree in electrical engineering from Ohio State University, Columbus, in 1965.

From 1959 to 1962, he was an officer in the U. S. Air Force assigned to the Navigation and Guidance Laboratory, Wright-Patterson Air Force Base, Ohio, and from 1962 to 1966, he

worked in systems analysis for the Air Force Systems Command. Since 1966, he has been with the Electronics Division, Georgia Institute of Technology, where he serves as Head of the Radar Branch and teaches courses in radar analysis and electromagnetic theory. His research interests include bioengineering, electromagnetic scattering, radar signal processing, and antenna synthesis.

Dr. Ecker is a member of Sigma Xi, Phi Kappa Phi, Tau Beta Pi, and Eta Kappa Nu.



**Allan H. Frey** (SM'67) was born in Philadelphia, Pa., in 1934.

He was previously employed by the Institute for Research, State College, Pa. and by HRB-Singer, Inc. Concurrently, he also carried out research at the National Institutes of Health. He is currently employed as Technical Director of Randomline, Inc., Willow Grove, Pa., where he is responsible for research involving the disciplines of biophysics, engineering, physiology, biochemistry, and psy-

chology. His interests are primarily in the areas of central nervous system function and sensory system function.



**Zorach R. Glaser** received the Ph.D. degree in physical and polymerchemistry from the Polytechnic Institute of Brooklyn, Brooklyn, N. Y., in 1968.

Prior to commissioning, he was an Electronics Technician and a Flight Crew Communicator with the U. S. Navy. He is currently a Military Scientist (Medical Service Corps Officer) at the Naval Medical Research Institute, Bethesda, Md. As Officer-in-Charge of the Electronics Laboratory Biophysics Division, he is studying biological effects of microwave and RF radiation and their relevance to the health of Naval personnel.

Dr. Glaser is a member of the American Chemical Society, the Aerospace Medical Association, the Undersea Medical Society, Phi Lambda Upsilon, and Sigma Xi.

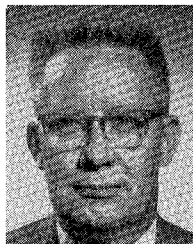


**Arthur W. Guy** (S'54-M'57) was born in Helena, Mont., on December 10, 1928. He received the B.S. degree in electrical engineering in 1955 and the M.S. and Ph.D. degrees in 1957 and 1966, respectively, all from the University of Washington, Seattle.

From 1947 to 1950 and from 1951 to 1952 he served in the United States Air Force as an electronics technician. Between 1957 and 1964 he was a research engineer in the Antenna Research Group, the Boeing Com-

pany, Seattle, Wash., and was engaged in research on broad-band and microwave devices, surface wave antennas, propagation through anisotropic dielectrics, and antennas buried in lossy media. Between 1964 and 1966 he was employed by the Department of Electrical Engineering, the University of Washington, and conducted research on VLF antennas buried in polar ice caps. Between 1957 and 1966 he was a consultant for the Department of Physical Medicine and Rehabilitation at the University of Washington School of Medicine, where he was concerned with problems associated with the effect of electromagnetic fields on living tissue. In 1966 he accepted his current position as an Assistant Professor in the above department where he is teaching and conducting research on the biological effects and medical applications of microwave energy.

Dr. Guy is a member of Phi Beta Kappa, Tau Beta Pi, Sigma Xi, and the American Association for the Advancement of Science and Chairman of C.95 Subcommittee IV of the American Standards Institute.



**Glenn M. Heimer** attended the University of Cincinnati, Cincinnati, Ohio, and received a degree in electrical engineering from the University of Maryland, College Park, in 1956.

He was previously employed by the National Bureau of Standards, Central Radio Propagation Laboratory Forecasting Group. Since 1960 he has headed the Navy's Ship Radio Frequency Radiation Hazard Reduction Program, where he is responsible for the development of protective clothing and

goggles for use at microwave frequencies and for the development of HF insulating links for use with cranes.

Mr. Heimer is a charter member of the ANSI C95 Sectional Committee on Radio Frequency Radiation Hazards and has been secretary of this committee since 1960.



**Henry S. Ho** (S'60-M'61) was born in Fukien, China, on September 8, 1942. He received the B.S., M.S., and Ph.D., degrees in electrical engineering from the University of Washington, Seattle, in 1965, 1967, and 1970, respectively.

He was a Research Assistant from 1965 to 1966, a Teaching Assistant from 1966 to 1967, and a Predoctoral Research Associate from 1967 to 1970, all at the University of Washington where he is currently doing postdoctoral research. His current research interest is directed towards the effect of electromagnetic field on human tissues.

Dr. Ho is a member of Tau Beta Pi.



**Richard C. Johnson** (M'57-SM'64) was born in Eleveth, Minn., on May 9, 1930. He received the B.S., M.S., and Ph.D. degrees in physics from the Georgia Institute of Technology, Atlanta, in 1953, 1958, and 1961, respectively.

In 1953 he entered the U. S. Navy, where he attended the Naval Electronic Materiel School and served as Electronics Officer aboard the U.S.S. Moale (DD693).

Since 1956, he has been actively engaged in research and development work in the Electronics Division, Georgia Institute of Technology. His fields of interest include microwave theory and techniques, antenna research and development, radar and radiometry systems, radio-frequency interference, and microwave spectroscopy. As Chief of the Electronics Division, he has general supervision over a wide range of research activities and he participates in his areas of specialization.

Dr. Johnson is a member of Tau Beta Pi, Sigma Pi Sigma, Sigma Xi, and the American Physical Society.



**Ira T. Kaplan** was born in New York, N. Y., on September 18, 1931. He received the B.A. degree from New York University, New York, in 1955, and the M.A. and Ph.D. degrees in experimental psychology from Columbia University, New York, N. Y., in 1956 and 1959, respectively.

He worked for several years in human engineering on the design of visual displays and on problems of man-computer interaction. Since 1965 he has been Chief Psychologist of the Zaret Foundation, Scarsdale, N. Y., and is on the faculties of New York University Medical School and Hofstra University. He has written over 20 papers on visual perception and human memory.

Dr. Kaplan is a member of the American Psychological Association.

**Justus F. Lehmann** was born in Koenigsburg, Germany, on February 27, 1921. From 1938 to 1939 he was a Candidate for Medicine at the Johann Wolfgang Goethe University, Frankfurt, Germany. He received the Medical Stateboard Diploma from the University of Leipzig, Leipzig, Germany, in 1939, and the Doctor of Medicine degree from Johann Wolfgang Goethe University in 1945.

He was with the Department of Medicine, University of Frankfurt, Frankfurt, Germany, from 1945 to 1947, the Max Planck Institute of Biophysics, Frankfurt, Germany, from 1947 to 1948, and again at the University of Frankfurt from 1948 to 1951. From 1951 to 1955 he was a Fellow in Biophysics and Physical Medicine and Rehabilitation at the Mayo Foundation and Mayo Clinic, Rochester, Minn. In 1955 he became Associate Director of the Department of Physical Medicine and Rehabilitation, University Hospital, Ohio State University, Columbus, and was an Assistant Professor at Ohio State University College of Medicine. In 1957 he accepted his current position as Professor and Chairman of the Department of Physical Medicine and Rehabilitation, University of Washington School of Medicine, Seattle.

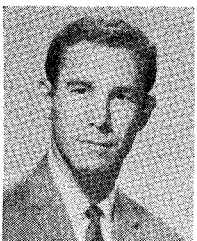


**Elliot M. Livstone** was born in Pittsburgh, Pa., on February 23, 1944. He received the B.S. degree from Tufts University, Medford, Mass., and the M.D. degree from Yale University School of Medicine, New Haven, Conn., in 1965 and 1969, respectively.

He served a straight medical internship at the University of Pittsburgh Health Center Hospitals, Pittsburgh, Pa., where he is currently a Teaching Fellow and a first year Resident in the Department of Internal Medicine.

He is a Diplomate of the National Board of Medical Examiners and the author of two *Yale Journal of Biology and Medicine* articles on the effects of X-radiation on the gastrointestinal tract.

Dr. Livstone is a member of Phi Beta Kappa and Sigma Xi.



**Richard F. Lutomirski** was born in Brooklyn, N. Y., on April 1, 1940. He received the B.S.E.E. degree from Brooklyn Polytechnic Institute, Brooklyn, N. Y., in 1960, the M.S. degree in electrical engineering from the California Institute of Technology, Pasadena, Calif., in 1961, and the Ph.D. degree in applied physics from Cornell University, Ithaca, N. Y., in 1965.

He is currently engaged in research on laser propagation through inhomogeneous media at The Rand Corporation, Santa Monica, California.



**Karel Marha** was born in Prague Czechoslovakia, on April 24, 1929. In 1952 he concluded studies at the Technical University, Prague, Czechoslovakia, in the field of physical chemistry and electrotechnology. He received the scientific degree in the branch of electrochemistry in 1957.

Since 1960 he has been in charge of the Laboratory of High Frequency, Institute of Industrial Hygiene and Occupational Diseases, Prague, where he is studying the mechanisms of biological effects of electromagnetic waves and problems concerning the protection of man against these effects.

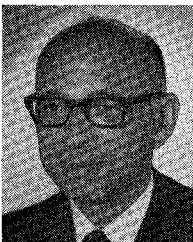
He is a member of Phi Beta Kappa and Alpha Omega Alpha.



**William Metlay** was born in New York, N. Y., on March 9, 1939. He received the B.A. degree from Southern Illinois University, Carbondale, in 1960, and the M.S. and Ph.D. degrees in experimental psychology from Lehigh University, Bethlehem, Pa., in 1962 and 1967, respectively.

From 1962 to 1963 he was a Research Scientist at Public Service Research, Inc., and Dunlap and Associates, Inc., Stamford, Conn. From 1963 to 1964 he performed human engineering research for the U. S. Naval Training Device Center, Port Washington, N. Y., also serving as Assistant Director of the Physiological Psychology Laboratory which conducted research on visual problems in homogeneous environments. After completing his doctoral work at Lehigh University, during which time he was a Research Assistant and Instructor of Psychology, he joined the faculty at Hofstra University, Hempstead, N. Y., as Assistant Professor of Psychology. He is also on the staff of the Zaret Foundation, New York, N. Y., and the Ophthalmology Department, New York University Medical Center, New York. He has over 20 publications in the field of visual perception and cognition.

Dr. Metlay is a member of the American Psychological Association, the American Association for the Advancement of Science, and Sigma Xi.

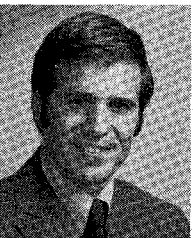


**Sol M. Michaelson** was born in New York, N. Y., on April 23, 1922. He received the B.S. degree from the College of the City of New York, N. Y., in 1942 and the D.V.M. degree from Middlesex University, Waltham, Mass., in 1946. From 1947 to 1948 he did postgraduate work in Biophysics at New York University, New York, N. Y.

From 1958 to 1965 he was a principal investigator for the USAF Tri-Service Program on Biologic Effects of Microwaves.

He is presently Associate Professor of Radiation Biology and Biophysics, and Medicine, School of Medicine and Dentistry, University of Rochester, Rochester, N. Y. As Chief, Radiation Physiology, Atomic Energy Project, University of Rochester, he is investigating the pathophysiology of exposure to electromagnetic radiation with emphasis on mechanisms of injury and recovery from both ionizing radiation and microwave exposure. He is a Visiting Radiation Biologist for the American Institute of Biological Sciences and has served as a Consultant to U.N.R.R.A., Walter Reed Army Institute of Research, Armed Forces Radiobiology Research Institute, Veterans Administration, and Association of Home Appliance Manufacturers. He is the senior author of the Air Force report on Biological Effects of Microwaves. He has written over 60 publications in the fields of physiology and electromagnetic radiation.

Dr. Michaelson is a member of Sigma Xi, American Physiological Society, International Federation for Medical Electronics and Biomedical Engineering, and the Radiation Research Society. He is currently a member of ANSI C-95.1 Subcommittee 4, Sectional Committee on RF Radiation Hazards and C 105 Subcommittee 3, Medical Electronics-Monitoring and Diagnostic Devices.



**Lawrence R. Muroff** was born in Philadelphia, Pa., on December 26, 1942. He received the B.S. degree from Dartmouth College, Hanover, N. H., 1964 and the M.D. degree from Harvard Medical School, Cambridge, Mass., in 1967.

He completed his internship at Boston City Hospital Harvard Surgical Service in 1968 and subsequently joined the Commission Corporation. He worked for the Division of Biological Effects, U. S. Public Health Service, for two years as a Staff Researcher. He is presently a resident in diagnostic radiology at Columbia Presbyterian Medical Center, New York, N. Y.

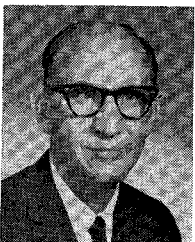
He is a member of Phi Beta Kappa and Alpha Omega Alpha.



**Vojin Popovic** was born in Belgrade, Yugoslavia, on September 18, 1922. He received a degree in physiology from the Faculty of Sciences in 1949 and the (Ph.D.) degree in physiology in 1951, both from the University of Belgrade, Belgrade, Yugoslavia.

He was Instructor of physiology at the University of Belgrade from 1949 to 1954 when he was appointed Associate Professor. He left Yugoslavia in 1956 to participate in the International Congress of Physiology

in Brussels, Belgium, and then went to Paris, France, at the invitation of the Centre National de la Recherche Scientifique to work in the Laboratory of Physiology of the Institute of Physico-Chemical Biology. In 1957 he went to the University of Rochester, Rochester, N. Y., as a Research Associate in the Department of Physiology, School of Medicine. From 1958 to 1959 he worked with the National Research Council, Division of Applied Biology, Medical School, University of Ottawa, Ont., Canada. He spent the academic year 1960-1961 at the Department of Biology, University of Houston, Houston, Tex., as Associate Professor. He began work with the Department of Physiology, Emory University, Atlanta, Ga., as Associate Professor, in 1961. In 1966 he was promoted to the rank of full Professor.

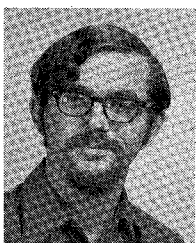


**Saul W. Rosenthal** (A'45-S'49-M'52-SM'54) was born in New York, N. Y., on August 13, 1918. He received the B.E.E. and M.E.E. degrees from the Polytechnic Institute of Brooklyn, Brooklyn, N. Y., in 1948 and 1952, respectively.

He was employed as a Research Associate at the Microwave Research Institute and is presently an Associate Professor and Administrative Officer of the Department of Electrophysics at the Polytechnic Institute of

Brooklyn. He is currently working in the areas of microwave technology, high-power microwaves, and the biological effects of microwave radiation.

Mr. Rosenthal is a member of the American Association for the Advancement of Science, the American Association of University Professors, the International Microwave Power Institute, and Sigma Xi. He is a past Chairman and member of the Administrative Committee of the IEEE Group on Microwave Theory and Techniques and is present Chairman of the American National Standards Institute's Sectional Committee C-95 on RF Radiation Hazards.



**George M. Samaras** (S'70) was born in Ottawa, Ont., Canada, on January 6, 1948. He is a full-time student in the Department of Electrical Engineering, University of Maryland, College Park, preparing for medical school.

He is also a full-time employee of the Division of Biological Effects, U. S. Public Health Service, Rockville, Md. He is presently developing a facility capable of (computer) controlling a complex multi-parameter environment within a chamber during microwave exposures.

Mr. Samaras is a student member of the American Cybernetics Society.



**Herman P. Schwan** (M'52-SM'55-F'59) was born in Aachen, Germany, on August 7, 1915. He received doctorates in both physics and biophysics from the University of Frankfurt, Frankfurt, Germany, in 1940 and 1946, respectively.

From 1937 to 1947 he was with the Max Planck Institute of Biophysics, Frankfurt, Germany, and from 1947 to 1950 he served as a Research Scientist with the U. S. Navy. Since 1950 he has been with the University of

Pennsylvania, Philadelphia, Pa., where he has headed the Electromedical Division, Moore School of Electrical Engineering, since 1952. In 1961 he became Chairman of the Biomedical Engineering Group, Graduate School of Arts and Sciences, University of Pennsylvania, the position he now holds. He has been Visiting Professor at the University of Frankfurt and the University of California. His specialties are biomedical engineering and biophysics with particular emphasis on electrical properties of biological materials and non-ionizing radiation hazards.

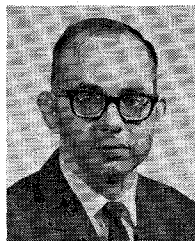
Dr. Schwan is a foreign life member of the Max Planck Institute of Biophysics and a fellow of the American Association for the Advancement of Science. He has served on many national committees including the Department of Health, Education, and Welfare National Advisory Council on Environmental Health, and he has contributed to the national development of biomedical engineering. He has also served on the Executive Committee of the IEEE's professional group in biomedical engineering from 1955 to 1959, acting as Chairman in 1960 and in 1968-1969. He has published 150 papers and has contributed to and edited several texts.



**Alan R. Shapiro** was born in Plainfield, N. J., on August 12, 1925. He attended Union College, Schenectady, N. Y., and New York University, New York.

From 1948 to 1952 he was engaged in research and engineering for the electronics facilities of the Israel Defense Forces. He joined the Bell Aircraft Corporation in 1952 where, until 1955, he was engaged in research and development for radar guided air-to-surface missiles and for inertial navigation

systems. From 1955 to 1963 he was on the staff of the Motorola System Research Laboratory and Manager of their Advanced Development Group where he conducted research in inertial navigation and plasma physics. He served as President and General Manager of Highland Research Corporation during 1963 and 1964. Since that time he has been on the staff of The Rand Corporation, where he is responsible for supporting physics research in engineering and engaged in research on topics in lasers and in biophysics.



**Albert P. Sheppard** (S'60-M'62-SM'65) was born in Griffin, Ga., on June 6, 1936. He received the B.S. degree in physics from Oglethorpe College, Atlanta, Ga., in 1958, the M.S. degree in physics from Emory University, Atlanta, Ga., in 1959, and the Ph.D. degree in electrical engineering from Duke University, Durham, N. C., in 1965.

From 1960 to 1963 he worked in the Research Division, Martin-Marietta Company, Orlando, Fla., in microwave and millimeter

wave instrumentation and lasers. From 1963 to 1965, he was with the U. S. Army Research Office, Durham, N. C., where he was engaged in research on microwave attenuators and open resonant cavities. In 1965 he joined the staff of the Electronics Division, Georgia Institute of Technology, where he has pursued research on microwave, millimeter wave, and submillimeter wave techniques, on materials measurements, on biological hazards of radiation, and on laser instrumentation.

Dr Sheppard is a member of Sigma Xi.



**Rubens A. Sigelmann** (M'65) was born in Sao Paulo, Brazil, on October 11, 1928. He received the M.E. and E.E. degrees from University of Sao Paulo, Sao Paulo, Brazil, in 1952, and the M.S. and Ph.D. degrees in electrical engineering from University of Washington, Seattle, in 1961 and 1963, respectively.

He was an Instructor at Instituto Tecnológico de Aeronautica, Sao Jose dos Campos, Brazil, from 1954 to 1956. From 1956 to 1959 he was an Instructor at Seattle University, Seattle, Wash. During 1957 he worked on microwave relay systems for Pacific Northwest Bell. He was an Acting Instructor of Electrical Engineering from 1959 to 1963 and Assistant Professor of Electrical Engineering from 1963 to 1969 at the University of Washington, where he is now an Associate Professor of Electrical Engineering. In 1966 he served on a team organized by the Stanford Research Institute, at the request of the United Nations, to formulate a technical training program in telecommunications for the Brazilian government. From 1966 to 1970 he was a Consultant to the Aerospace Group of the Boeing Company. From 1968 to 1969 he was the co-chairman of Energy Transfer Division of the Bioengineering program at the University of Washington. His research interests are in the areas of traveling-wave antennas, pattern synthesis and propagation, and ultrasound.

Dr. Sigelmann is a member of the Biomedical Engineering Society.



**Paul F. Wacker** was born in Lancaster, Ohio, on May 25, 1914. He received the B.A. and M.A. degrees in physical chemistry from Ohio State University, Columbus, and the Ph.D. degree in theoretical physics from the Catholic University of America, Washington, D. C., in 1954.

He has been employed by the National Bureau of Standards, Boulder, Colo., since 1944, becoming a Consultant in Theoretical Physics and Applied Mathematics in 1958.

His principal activity is in electromagnetic theory of fields and antennas. He has published works on chemical thermodynamics, microwave spectroscopy, and near-field measurements of antennas, as well as on hazards of nonionizing radiation.



**Harold T. Yura** was born in Buffalo, N. Y., on November 20, 1938. He received the B.Sc. and Ph.D. degrees in physics from California Institute of Technology, Pasadena, Calif., in 1959 and 1962, respectively.

He is currently engaged in research in laser propagation through inhomogeneous media at The Rand Corporation, Santa Monica, California.



**Milton M. Zaret** was born in Passaic, N. J., on December 20, 1920. He received the B.A. degree from the University of Pennsylvania, Philadelphia, in 1946, and the M.D. degree from New York Medical College, New York, in 1950.

At present he conducts an active practice as an ophthalmologist and is Assistant Clinical Professor of Ophthalmology at New York University. In addition, he has for many years pursued research interests in the area of injury

to the eye by ionizing, laser, and microwave radiation. As a convenient vehicle for carrying on this work he has established the Zaret Foundation, Scarsdale, N. Y., for which he serves as Director of Research. Also, he is Consultant to the New York State Department of Health and to the medical directors of a number of industrial organizations.

Dr. Zaret is a member of the American Medical Association, the Association for Research in Ophthalmology, the Aerospace Medical Association, the American Academy of Ophthalmology and Otolaryngology, the Pan American Medical Association, the American Institute of Physics, and the Optical Society of America. He has been a diplomate of the American Board of Ophthalmology since 1955 and a fellow of the American College of Surgeons since 1962.



**Robert P. Zimmer** was born in New Orleans, La., on September 21, 1938. He received the B.S. degree in electrical engineering from University of Notre Dame, Notre Dame, Ind., in 1960 and the M.S. degree in electrical engineering from Cornell University, Ithaca, N.Y., in 1964. He is currently completing the requirements for the M.S. degree in industrial management at Georgia Institute of Technology, Atlanta.

He joined Sperry Microwave Electronics Company in 1964 where he was engaged in the development of solid-state microwave devices. Since 1965 he has been a member of the electronics division of Georgia Institute of Technology where he has been involved in the development of microwave circuits, antennas, and microwave subsystems. He has been Project Director of a program concerned with the development of an inertialess geodesic lens scanner and also of a project concerned with the application of electromagnetic energy in cancer research. His research interests include bioengineering, applied electromagnetic theory, and radar systems.