

Contributors.



John W. Allis was born in Buffalo, NY, on April 24, 1939. He received the B.S. degree in chemistry from Syracuse University, Syracuse, NY, in 1960 and the Ph.D. degree in physical chemistry from the University of Wisconsin, Madison, in 1965.

He was a research associate at Georgetown University, Washington, DC, working in protein physical chemistry before joining the Bureau of Radiological Health of the Department of Health, Education and Welfare. He transferred to the U.S. Environmental Protection Agency at its inception in 1971. He has been engaged in research in biological effects of nonionizing radiation, especially the mechanisms of interaction, since joining the Bureau of Radiation Health.



Fulvio G. Ananasso was born in Rome, Italy, on October 17, 1950. He received the Electronics and Electrical Communications Engineer degree from the University of Roma, Rome, Italy, in 1973, with a thesis regarding the radiowave propagation at 18 GHz.

In the same year, he joined the Italian Army as an Officer in the Technical Services regarding Military Telecommunications. He made this activity up to the end of 1974, mainly acting as Technical Instructor of radiopropagation and transmitting techniques. Since the beginning of 1975, he joined Selenia S.p.A. (Via Tiburtina km.12.400, 00131 Roma, Italy), as Microwave Engineer in the Development Laboratory, where he has been working at microwave hardware for Radar Systems and Satellite Telecommunication equipments.

Since 1974, he has also been collaborating with the Electrical Communications Institute of the University of Roma, mainly for the aspects connected to the Radio Relay Links at frequencies above 15 GHz. Relatively to this matter, he is Assistant Professor in the University of Rome.



John W. Archer was born in Sydney, Australia, in 1950. He received the B.Sc., B.E. (Hons 1) and Ph.D. degrees from Sydney University in 1971, 1973, and 1978, respectively.

From 1974 to 1977 he was employed with CSIRO, Radiophysics Division, developing receiver and antenna systems for a radio interferometer operating at 100 GHz for high resolution solar radio astronomy. From 1977 to 1979 he was with NRAO's VLA program as a systems development and evaluation engineer. Since

September 1979, he has worked in the NRAO Electronics Research and Development group in Charlottesville, VA. His current research interests are the development of low cost, efficient power sources at short millimeter lengths and the design of low-noise mixers to operate near 230 GHz.



Peter W. Barber (M'74) was born in Anchorage, AK on September 5, 1942. He received the B.S. degree in electrical engineering from Washington State University, Pullman, in 1964, and the M.S. and Ph.D. degrees in engineering from the University of California, Los Angeles, in 1967 and 1973, respectively.

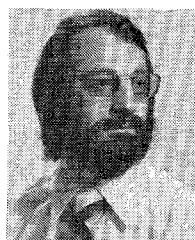
From 1964 to 1974 he was employed as an electrical engineer by the McDonnell Douglas Corporation, Long Beach, CA, where he was primarily engaged in the design of aircraft antennas. Since July 1974 he has been associated with the University of Utah, Salt Lake City, where he is presently an Associate Professor in the Departments of Bioengineering and Electrical Engineering. He is currently engaged in teaching and research in electromagnetic theory.

Dr. Barber is a member of Sigma Tau and Tau Beta Pi, and an associate member of Commission B, USNC/URSI.



Günther Begemann was born in Oerlinghausen, West Germany, on February 4, 1948. He received the Dipl. Ing. degree in electrical engineering in 1975. He joined the Institut für Hochfrequenztechnik of the Technische Universität Braunschweig, West Germany, in 1975. He is presently studying toward the Ph.D. degree, working on microwave solid-state circuits, especially mixers, and planar integrated circuits.

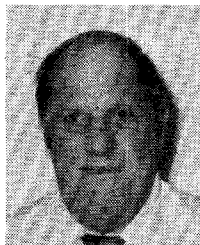
Mr. Begemann is a member of the Verband Deutscher Elektrotechniker (VDE).



Carl F. Blackman received the A.B. degree in physics from Colgate University in 1963, and the M.S. and Ph.D. degrees in biophysics from Pennsylvania State University, University Park, in 1967 and 1969, respectively.

Following two years of post-doctoral work in Gerontology at Brookhaven National Laboratory, he joined the Bureau of Radiological Health in October 1970. He was transferred to the U.S. Environmental Protection Agency when the Agency was created in December 1970, and has since been conducting research on the biological effects of nonionizing electromagnetic radiation, examining both the mutagenic potential of microwaves in bacteria and radiation-induced changes in ion-association with brain tissue. He is currently working as a Biologist for the U.S. Environmental Protection Agency in Research Triangle Park, NC.

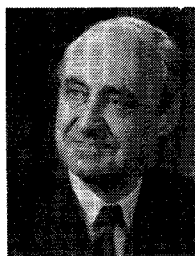
Dr. Blackman is a member of the Biophysical Society, the American Society for Photobiology, and the Bioelectromagnetics Society.



Ernest M. Caloccia (M'74) was born in Worcester, MA, in 1935. He received the B.A. degree in physics at Clark University, in 1958.

Since 1958 he has worked on active and passive microwave components and subsystems in stripline, microstrip, and waveguide transmission mediums at Raytheon Company, Sanders Associated, RCA, United Technology Labs, MDL, Brown and NRAO on the waveguide transmission systems at "VLA" from 1975 to 1979. He is presently with Raytheon Company, Bedford, MA.

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Ferdinand Cap was born in 1924 near Vienna, Austria. He studied physics, mathematics, and chemistry from 1942 to 1946 at the University of Vienna, Vienna, Austria.

He became a Lecturer at the University of Innsbruck, Innsbruck, Austria, in 1949 after a stay at the Zürich Technical University. He was promoted to Assistant Professor in 1955, Associate Professor with tenure in 1957, and Full Professor in 1960. In 1967, he was Guest Professor for Plasma Physics in New York. In

1971 he became a Senior Research Associate of NASA at Goddard Space Center. For 10 years he was Austria's Scientific Representative at the U.N. in New York. He has published more than 100 papers in physics and several textbooks about nuclear reactors and plasma physics. In 1979 he was Research Associate at Princeton Plasma Physics Laboratory.

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A. L. Cullen (M'56-SM'60-F'67) was born in London, England, in 1920. He was educated at Lincoln School and Imperial College of Science and Technology.

On graduating, he went to the Royal Aircraft Establishment, Farnborough, where he worked on radar during the war years. In 1946, he took up a Lectureship in the Department of Electrical Engineering at University College London where he worked with Professor H. M. Barlow in building up microwave research in that department.

In 1955 he was appointed to the Chair of Electrical Engineering in the University of Sheffield. In 1967 he returned to University College to succeed Professor Barlow in the Pender Chair of Electrical Engineering. He was appointed OBE in 1960.

Dr. Cullen was elected a Fellow of Royal Society in 1977.

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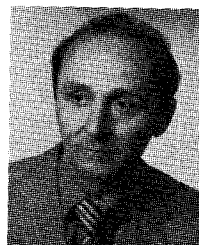
J. S. Dahele was born in India in 1938. He studied part-time, first at Harlow Technical College, and later at the University of Surrey, London, England, where he received the Post Graduate Diploma in microwave physics in 1968. He received the Ph.D. degree from The University of Hong Kong, in 1979.

He started work at Cossor Radar and Electronics in 1960. In 1961, he joined Standard Telecommunication Laboratories, where his main interest was in the area of microwaves. In

1973, he joined the Electronics Department of The Chinese University of Hong Kong as a Lecturer, and has been particularly involved as Coordinator of a Work Study Program started in 1975. During 1978-1979, while on leave from The Chinese University of Hong Kong, he worked in the Electromagnetics Group of the Microwave Research Unit at University College London.

Dr. Dahele is a Chartered Engineer and a member of the IEE and IERE.

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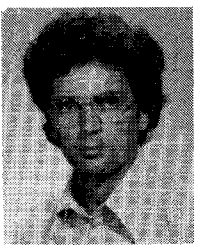


Rudolf Deutsch was born in Braşov, Romania, in 1931. He studied chemistry at the University of Cluj, Cluj, Romania, from 1950 to 1954. In 1962 he received the Ph.D. degree in theoretical physics from the Lomonosov University of Moscow, Moscow, USSR.

From 1954 to 1959 he was a teacher at a secondary school and a Research Assistant at the University of Cluj, Cluj, Romania. From 1962 to 1973 he was Reader in Physics at the Polytechnical Institute of Iasi, Iasi, Romania.

From 1973 to 1977, he did research work for a brewery of Innsbruck, Austria. In 1975, he became a Reader in Theoretical Physics at the University of Innsbruck, Innsbruck, Austria. He is currently working as Visiting Professor at the Institute for Plasma Research of the University of Stuttgart, Stuttgart, Germany. He is the author of 4 books and 68 papers in theoretical physics.

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Corrado Dragone received the Laurea in electrical engineering in 1961 from Padua University, Padua, Italy, and the Libera Docenza in 1968 from the Ministero della Pubblica Istruzione Italy.

Since 1961 he has been with Bell Laboratories, where he has been engaged in experimental and theoretical work on microwave antennas and solid-state power sources. In 1974/1975 he taught a course on antennas and propagation at Padua University. He is currently working on

problems involving electromagnetic antennas for terrestrial radio systems and satellite communications.

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Carl H. Durney (S'60-M'64) was born in Blackfoot, ID, on April 22, 1931. He received the B.S. degree in electrical engineering from Utah State University, Logan, in 1958, and the M.S. and Ph.D. degrees in electrical engineering from the University of Utah, Salt Lake City, in 1961 and 1964, respectively.

From 1958 to 1959 he was employed as an Associate Research Engineer with the Boeing Airplane Company, Seattle, WA, where he studied the use of delay lines in control systems.

He has been with the University of Utah since 1963, when he was appointed to be Assistant Research Professor in electrical engineering. From 1965 to 1966 he was employed at the Bell Telephone Laboratories, Holmdel, NJ while on leave from the University of Utah. During this time he worked in the area of microwave avalanche diode oscillators. Again, in 1971, he was engaged in study and research involving microwave biological effects at the University of Washington while on leave

from the University of Utah. He is presently Professor and Chairman of Electrical Engineering at the University of Utah, where he is engaged in teaching and research in electromagnetics, engineering pedagogy, and microwave biological effects.

Dr. Durney is a member of Commission B of URSI (International Union of Radio Science), Sigma Tau, Phi Kappa Phi, Sigma Pi Sigma, Eta Kappa Nu, and the American Society for Engineering Education.

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Michael Dydyk (SM'79) was born in Hynovychi, Ukraine, on September 14, 1937. He received the BSEE and MEE degrees from Newark College of Engineering, Newark, NJ, and City College of New York, NY, in 1959 and 1963, respectively. In addition, he completed the course requirements towards a Ph.D. in electrophysics at Polytechnic Institute of Brooklyn, Brooklyn, NY.

Since 1959, he has worked in a number of microwave/millimeter wave areas, including ferrimagnetic devices, amplifiers, oscillators, power combiners, and a variety of different passive components and subsystems. His employment history includes positions with Sperry Gyroscope Company, Singer Metrics, and Loral Electronics Systems. Since September 1971 he has been with Motorola GED, where as Member of Technical Staff, he is pursuing research programs dealing with millimeter-wave integrated circuits.

Mr. Dydyk is a member of Motorola's Science Advisory Board Associates (SABA). He has six patents to his credit with three pending and has published several papers in national technical journals.

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Johann H. Hinken (M'79) was born in Wagenfeld, Germany, on April 17, 1946. He received the Dipl.-Ing. degree in electrical engineering and the Doktor.-Ing. degree from the Technische Universität Braunschweig, Braunschweig, Germany, in 1972 and 1978, respectively.

From 1972 to 1978 he was Assistant at the Institut für Hochfrequenztechnik of the Technische Universität Braunschweig, where he was engaged in investigations on microwave filters and on the attenuation of optical film modes.

Since 1978, he has been with the Physikalisch-Technische Bundesanstalt, Braunschweig, where he is involved with precision dc measurement applying superconducting phenomena and microwave means.

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Wolfgang J. R. Hoefer (M'71-SM'78) was born in Urmitz/Rhein, Germany, on February 6, 1941. He received the diploma in electrical engineering from the Technische Hochschule Aachen, Aachen, Germany, in 1965, and D. Ing. degree from the University of Grenoble, Grenoble, France, in 1968.

After one year of teaching and research at the Institut Universitaire de Technologie, Grenoble, France, he joined the Department of Electrical Engineering, the University of Ottawa, Ottawa,

Ont., Canada and is currently an Associate Professor and the Chairman of this department. During a sabbatical year in 1976/77, he spent six

months with the Space Division of the AEG-Telefunken in Backnang, Germany, and six months with the Institut National Polytechnique de Grenoble, France. His research interests include microwave measurement techniques and millimeter wave circuit design.

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Mark A. Hollis (A'74-S'75) was born in Asheville, NC, on December 2, 1956. He graduated with Distinction from Duke University in Durham, NC, in May 1979 with a BSE in electrical engineering. In his first two years at Duke he was involved with maintenance, design, and development of campus audio and video systems. From January 1978 to August 1979 he was employed part-time by the U. S. Environmental Protection Agency's Health Effects Research Laboratory in Research Triangle Park, NC.

While there he was involved in the investigation of the biological effects of electromagnetic radiation. He is now in graduate study in electrical engineering at Cornell University in Ithaca, NY.

Mr. Hollis is a member of the Audio Engineering Society, Phi Eta Sigma, Eta Kappa Nu, Tau Beta Pi, and Phi Beta Kappa.

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Magdy F. Iskander (S'72-M'76) was born in Alexandria, Egypt, on August 6, 1946. He received the B.Sc. degree with the first class honors in electrical engineering, University of Alexandria, Alexandria, Egypt, in 1969. He entered the Faculty of Graduate Studies at the University of Manitoba, Winnipeg, Manitoba, Canada, in September 1971, and received the M.Sc. and Ph.D. degrees, both in microwave, in September 1972 and February 1976, respectively.

From 1969 to 1971, he was employed as a Teaching Assistant in the Department of Electrical Engineering at the University of Alexandria, and at that time he worked on the design and development of ion sources. In 1976, he was awarded a National Research Council of Canada Postdoctoral Fellowship at the University of Manitoba. Since March 1977, he has been with the Department of Electrical Engineering and the Department of Bioengineering at the University of Utah, Salt Lake City, where he is currently an Assistant Professor of Electrical Engineering. His present fields of interests include the scattering and diffraction of electromagnetic waves, antenna design, and the biological effects as well as the medical applications of electromagnetic waves.

Dr. Iskander is a member of the American Society of Engineering Education.

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Tatsuo Itoh (S'69-M'69-SM'74) received the Ph.D. degree in electrical engineering from the University of Illinois, Urbana, in 1969.

From September 1966 to April 1976 he was with the Electrical Engineering Department, University of Illinois. From April 1976 to August 1977 he was a Senior Research Engineer in the Radio Physics Laboratory, SRI International, Menlo Park, CA. From August 1977 to June 1978 he was an Associate Professor at the University of Kentucky, Lexington. In July 1978

he joined the faculty at The University of Texas at Austin, where he is now an Associate Professor of Electrical Engineering and Director of Microwave Laboratory. During the summer 1979, he was a Guest Researcher at AEG-Telefunken, Ulm, West Germany.

Dr. Itoh is a member of the Institute of Electronics and Communication Engineers of Japan, Sigma Xi, and Commission B and C of USNC/URSI. He is a Registered Professional Engineer in the State of Texas.

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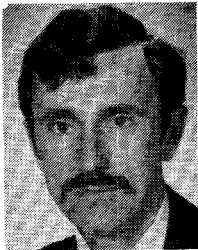


Paul R. Karmel received a B.E.(E.E.) from Cornell University, Ithaca, NY, in 1956, an M.S.(E.E.) from the Massachusetts Institute of Technology, Cambridge, in 1957, and a D. Engr. Sc. from Columbia University, New York, NY in 1964.

Since 1964, he has been a Professor in the Department of Electrical Engineering at The City College of the City University of New York, where he has taught undergraduate and graduate courses in electromagnetics and microwave engineering. He served as Acting Dean of the School of Engineering for two years. From September 1977 to August 1979, he was with the Antenna Department of the Microwave Laboratory at COMSAT Laboratories in Clarksburg, MD, while on leave from The City College.

Dr. Karmel is a member of Eta Kappa Nu, Tau Beta Pi, Sigma Xi, and A.S.E.E.

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Jeffrey B. Knorr (S'68-M'71) was born in Lincoln Park, NJ, on May 8, 1940. He received the B.S. and M.S. degrees in electrical engineering from Pennsylvania State University, University Park, PA, in 1963 and 1964, respectively, and the Ph.D. degree in electrical engineering from Cornell University, Ithaca, NY, in 1970.

From 1964 to 1967 he served with the U.S. Navy. In September 1970, he joined the faculty of the Naval Postgraduate School, Monterey, CA, where he currently holds the rank of Associate Professor in the Department of Electrical Engineering. He is also a member of the interdisciplinary Electronic Warfare Academic Group which is responsible for the administration of the Electronic Warfare Curriculum at the Naval Postgraduate School.

Dr. Knorr is a member of Sigma Xi and the IEEE Microwave Theory and Techniques Society.

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Masanori Kobayashi (M'79) was born in Niigata, Japan, on June 17, 1947. He received the B.E. and M.E. degrees in electrical engineering from the University of Ibaraki, Ibaraki, Japan, in 1970 and 1972, respectively.

Since 1972, he has been an Assistant in the Department of Electrical Engineering, University of Ibaraki. He has worked mainly in the field of microwave integrated circuits. At present, his main fields of interest are multicoupled microstrip lines and electrostatic fields in multi-anisotropic media.

Mr. Kobayashi is a member of the Institute of Electrical Engineers of Japan and the Institute of Electronics and Communication Engineers of Japan.

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Yoshlomi Y. Koyano was born in Auburn, WA, on April 26, 1926. He attended the Milwaukee School of Engineering from 1948 to 1950 and completed the requisite courses for a diploma in electronics.

From 1952 to 1955 he served in the U.S. Army Signal Corp. at Ft. Monmouth, NJ. In 1955 he joined Sylvania Electric Products in Mt. View, California, and worked in the Microwave Tube Laboratory, where he was engaged in fabricating and testing of Microwave Traveling-Wave Tubes. In 1963 he joined Watkins-Johnson Company where he was initially active in the development and testing of high power traveling-wave tubes. His responsibilities included the designing of input and output matching networks and performing attenuations studies for the medium and high power X-band Traveling-Wave Tubes. In 1964, he transferred to the Solid-State Division where he was responsible for the development of fast switching YIG filters and multiplexers. He has also developed a complete line of digitally tuned harmonic generators from L through X-bands. He has also designed and developed YIG-tuned transistor and GaAs oscillators over this same frequency range. In his more recent work he has been in charge of the design and development of broad-band and thin-film YIG tuned bipolar and field-effect transistor oscillators.

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Elias Kpodzo (S'80) was born in Dzodze, Ghana, on July 14, 1942. He received the Dipl. Ing. degree in electrical engineering from the Universität Stuttgart, West Germany, in 1972.

He joined the SIEMENS Central Laboratory for Telecommunications in Munich, West Germany, as a development engineer in 1972, working on radio relay systems. Since 1977 he has been with the Institut für Hochfrequenztechnik of the Technische Universität Braunschweig, West Germany, where he is presently studying towards the Ph.D. degree, working on microwave solid-state and integrated circuits. His current area of research is the analysis, development, and optimization of digital phase modulators in the centimeter and millimeter waveband.

Mr. Kpodzo is a Student Member of the Verband Deutscher Elektrotechniker (VDE).

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J. Eugene Lewis (S'62-M'69-SM'79) received the B.Sc.E. degree in electrical engineering from the University of New Brunswick, Fredericton, Canada, in 1964, and the Ph.D. degree from the University of British Columbia, Vancouver, B.C., Canada, in 1968.

During 1968-69 he was a National Research Council of Canada Postdoctoral Fellow at Southampton University, England, where he worked on fiber optical waveguides. In 1969 he joined the Electrical Engineering Department,

University of New Brunswick, as an Assistant Professor and became an Associate Professor in 1974. His research interests include industrial applications of microwave technology and electromagnetic waveguides.

Dr. Lewis is a member of the Institution of Electrical Engineers, U.K., the International Microwave Power Institute, Canada, and the IEEE Society on Microwave Theory and Techniques.

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John D. Love was born in Nottingham, England, on October 2, 1942. He received the B.A. degree from Cambridge University in 1964, and the D.Phil. degree in applied mathematics from Oxford University in 1969.

From 1969 to 1971 he was a Post-Doctoral fellow at the University of California, San Diego, working on nonlinear plasma phenomena, and from 1971 to 1973 was an engineering technologist at the University of Toronto investigating problems in aeronomy. In 1973 he joined the

Department of Applied Mathematics in the Institute of Advanced Studies of the Australian National University in Canberra, where he is now a Senior Research Fellow in optical waveguide theory.

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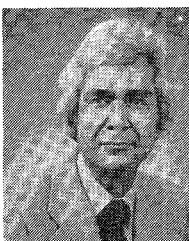


Ernesto Marazzi was born in Milan, Italy. He obtained his degree in electronic engineering from the Politecnico di Milano, Milano, Italy in 1965.

He was Research Assistant at the Politecnico di Milano from 1965 to 1968, working on threshold extension for FM PLL receivers. In 1968 he joined the Transmission Laboratory of Telettra, Milan, Italy, where he had system design responsibility for a 2-GHz injection-locked low-power-consumption radio repeater. Com-

puter-aided design of microwave thin-film transistor amplifiers and production yield evaluation were part of his activity for several years, besides design of IF assemblies, amplifiers and filters. From 1975 to 1977 he was Sales Manager of Elettronica Microonde, Milan, as Italian representative of Microwave Associates, Burlington, MA. In 1977 he joined SIAE Microelettronica, Cologno Monzese, Milan, Italy, where he was appointed Director of Transmission Laboratories.

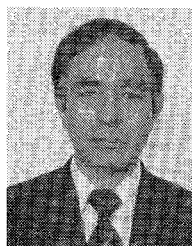
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Habib Massoudi (S'74-M'76) received the B.Sc. (Honors) degree from Teacher's Training University, Tehran, Iran, in 1964, and the M.S. degree from the University of Tehran, Tehran, Iran, in 1970, both in physics. Continuing his graduate studies at the University of Utah, Salt Lake City, he obtained the Ph.D. degree in electrical engineering in 1976.

He worked as a physics teacher in Iran from 1964 to 1970. Since 1976, he has been with the University of Utah, where he is a Research

Assistant Professor of electrical engineering with research interest in electromagnetic radiation, scattering, and interaction with biological systems.



Tsukasa Nagao (M'72) was born in Hyogo, Japan. He graduated from the National Defense Academy and received the M.S. and Ph.D. degrees from the University of Tohoku, Sendai, Japan, in 1961 and 1964, respectively, both in electrical communication engineering.

Since 1945 he has been with the Department of Electrical Engineering, the National Defense Academy, Yokosuka, Japan, where he is now Associate Professor. His present interest includes nonreciprocal and nonlinear devices, and

transmission lines in regions from microwaves to lights.

Dr. Nagao is a member of the Institute of Electronic and Electrical Communication Engineers, and the Institute of Japanese Applied Physics.

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James C. Papp (M'75) was born in Los Angeles, CA, in 1947. He received an A.B. (with distinction) in 1968, and Ph.D. degrees in 1968 and 1974, respectively, from the University of California, Berkeley, all in physics.

He joined Watkins-Johnson Company in 1974 as a Member of the Technical Staff involved in the design and development of YIG tuned bulk-effect and transistor oscillators. In 1976 he became Head of the YIG Device Engineering Section with responsibility for design and development of YIG oscillators, filters, and harmonic generators. During this time he designed the company's first 8-18-GHz oscillator. In 1978 he became responsible for the design, development, and production of microwave mixers and converters.

Dr. Papp is a member of the American Physical Society and Phi Beta Kappa.

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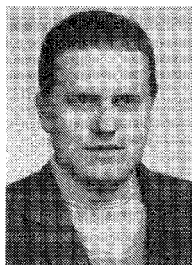


C. Read Predmore (M'73) received the B.S. degree in physics from the Virginia Polytechnic Institute and State University, Blacksburg, in 1967, and the Ph.D. degree in physics from Rice University, Houston, TX, in 1971.

From 1971 to 1972 he was an Assistant Professor in the Department of Space Physics and Astronomy at Rice University where he continued his work in radio astronomy and initiated a submillimeter laser project. In 1972 he joined the National Radio Astronomy Observatory

where he worked on the development and design of the TE_{01} circular waveguide transmission system for the Very-Large-Array radio telescope. Since 1975 he has been at the University of Massachusetts, Amherst, where he is doing research and development on low-noise receivers, quasi-optical techniques, and molecular astronomy for the millimeter wave telescope of the Five College Radio Astronomy Observatory.

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Vittorio Rizzoli (M'79) was born in Bologna, Italy, in 1949. He graduated from the School of Engineering, University of Bologna, Bologna, Italy, in July 1971.

From 1971 to 1973 he was with the Centro Onde Millimetriche of Fondazione Ugo Bordoni, Pontecchio Marconi, Italy, where he was involved in a research project on millimeter-waveguide communication systems. In 1973 he was with Hewlett-Packard Company, Palo Alto, CA, working in the areas of MIC and

microwave power devices. Since 1974, he has been Associate Professor at the University of Bologna, where he is now teaching a course on microwave integrated circuits. His current fields of interest are the design of microstrip circuits and the theoretical aspects of electromagnetic propagation in optical fibers.



Adel A. M. Saleh (M'70-SM'76) was born in Alexandria, Egypt, on July 8, 1942. He received the B.Sc. degree in electrical engineering from the University of Alexandria, Alexandria, Egypt in 1963, and the M.S. and Ph.D. degrees in electrical engineering from the Massachusetts Institute of Technology, Cambridge, MA, in 1967 and 1970, respectively.

From 1963 to 1965 he worked as an Instructor at the University of Alexandria. In 1970 he joined Bell Laboratories, Holmdel, NJ, where he is engaged in research on microwave circuits, components, and systems. His main interest is in the areas of power combiners, FET power amplifiers, quasi-optical components, and microwave mixers.

Dr. Saleh is a Member of Sigma Xi.



Daniel J. Schaefer (S'76) was born in Claremore, OK, on February 10, 1947. He received the B.S. degree in physics from Oklahoma State University, Norman, in 1969, the M.S. degree in chemistry from the University of North Carolina, Chapel Hill, in 1976, the M.S. degree in electrical engineering from Duke University, Durham, NC, in 1977, and he is currently a candidate for a doctoral degree at Duke University in electrical engineering.

From 1974 to 1976, he was a Research and Teaching Assistant at the University of North Carolina doing research on the physical biochemistry of prothrombin in blood coagulation. From 1976 to 1979 he was a teaching and research assistant at Duke University doing research on the biological effects of microwave irradiation and on the design of contact microwave diathermy applicators. From 1979 to the present he has been employed part time by the U.S. Environmental Protection Agency as an Electronics Engineer doing research on swept frequency techniques for determining the complex permittivity of chemical solutions at microwave frequencies.

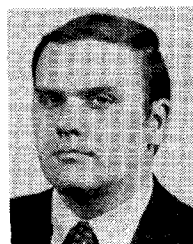


Klaus Schünemann was born in Braunschweig, West Germany, on June 17, 1939. He received the Dipl. Ing. degree in electrical engineering and the Dr. Ing. degree from Technische Universität Braunschweig, West Germany, in 1965 and 1970, respectively.

From 1965 to 1970 he was Assistant at the Institut für Hochfrequenztechnik of the Technische Universität Braunschweig, where he was engaged in investigations on frequency multiplication and on diode modeling for switching applications. He has published several papers on these topics. From 1970 to 1971 he was with Valvo GmbH, Hamburg, Germany, working in the area of high power high stable solid-state oscillators. Since 1972, he has been with the Institut für Hochfrequenztechnik of the Technische Universität Braunschweig again, where he has been involved with investigations on high-speed modulators for PCM communication systems and on amplification and noise in solid-state oscillators. His current research interests are principally concerned with new technologies for microwave integrated circuits such as fin-line and waveguide-below-cutoff techniques.

interests are principally concerned with new technologies for microwave integrated circuits such as fin-line and waveguide-below-cutoff techniques.

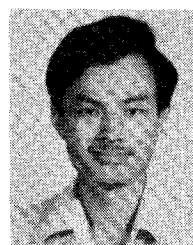
Rey Serna is a member of the technical staff, Electronics Division, Very Large Array Program, and is currently responsible for modification, maintenance and system testing of the waveguide communication system. Previously, he was employed at White Sands Missile Range, NM, and was involved in the system testing of such projects as the Shram, Apollo, Athena, and Streak Eagle.



Paul M. Shayda (M'79) was born in Baltimore, MD, on April 15, 1947. He received the B.S. degree from Marquette University, Milwaukee, WI, in 1973, and the M.S. degree in electrical engineering from the Naval Postgraduate School, Monterey, CA, in 1979.

He was commissioned an officer in 1973 after serving seven years in the U.S. Navy as an electronic technician. Prior to his assignment to the Naval Postgraduate School, he served as Electronic Material Officer, Missile Fire Control Officer, and Missile Officer aboard the guided missile cruiser Wainwright. He is currently assigned as the Assistant Director, 3D Radar Division in the Surveillance System Subgroup (SEA-62X) in the Naval Sea Systems Command, Washington, DC.

Lt. Shayda is a member of Sigma Xi and the IEEE Microwave Theory and Techniques Society.



Yi-Chi Shih (S'80) was born in Taiwan, the Republic of China, on February 8, 1955. He received the B.E.E.E. degree from National Taiwan University in 1976. Since 1978, he has been a graduate student in the Department of Electrical Engineering, Ottawa, Ont., Canada, where he is working toward the M.A.Sc. degree. He is studying the application of numerical methods to the analysis and design of microwave components.



Zengo Tanaka was born in Tottori, Japan, in 1941. He received the B. S. degree from Kanagawa University, Kanagawa, Japan, in 1965.

Since 1965 he has been with the Department of Electrical Engineering, the National Defense Academy, Yokosuka, Japan, where he has been engaged in research and development of microwave devices.

Mr. Tanaka is a member of the Institute of Electronic and Electrical Communication Engineers, Japan.



Ryuiti Terakado was born in Tokyo, Japan, on January 30, 1930. He graduated from the Taga Technical College, Ibaraki, Japan, in 1950. He received the D.E. degree from the Tokyo Institute of Technology, Tokyo, Japan, in 1975.

In 1960 he joined the Department of Electrical Engineering, Ibaraki University, where he is now a Professor. His major research interests are two-dimensional fields and symmetry.

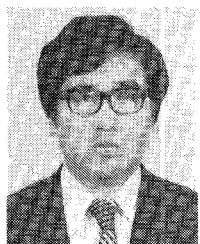
Dr. Terakado is a member of the Institute of Electrical Engineers, the Institute of Electronics and Communication Engineers, and the Society of Instrument and Control Engineers, all of Japan.



James M. Tranquilla (S'69-M'77) was born in New Brunswick, Canada, on May 1, 1948. He received the B.Sc.E. and M.Sc.E. degrees in electrical engineering from the University of New Brunswick, Fredericton, N.B., Canada, in 1971 and 1973, respectively, and the Ph.D. degree from the University of Toronto, Toronto, Ont., Canada, in 1979.

For two periods during 1970 and 1971 he worked as a Research Assistant and Engineer with the Defence Research Establishment

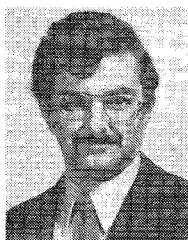
Atlantic, Halifax, N.S., Canada, and since 1977 has been an Assistant Professor in Electrical Engineering at the University of New Brunswick. His research interests include frequency independent antennas, conformal arrays, broad-banding techniques for antennae, and industrial microwave power applications.



Ryuichi Watanabe was born in Sapporo, Japan, on January 17, 1950. He received the B.S. and M.S. degrees in electronics engineering from Hokkaido University, Sapporo, Japan, in 1973 and 1975, respectively.

He joined the Electrical Communication Laboratory, N.T.T., Japan, in 1975, and has been engaged in research works on passive devices for short-millimeter wavelength. Recently, his major efforts have been directed toward optical passive devices.

Mr. Watanabe is a member of the Institute of Electronics and Communication Engineers of Japan.

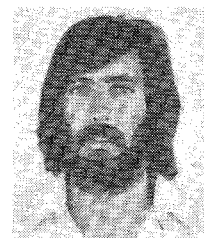


Claude M. Weil (M'64) was born in Newcastle-on-Tyne, England, on June 26, 1937. He received the B.Sc. degree in 1959 from the University of Birmingham, Birmingham, England, the M.S.E. degree in 1963 from George Washington University, Washington, DC, and Ph.D. in 1970 from the University of Pennsylvania, Philadelphia, all in electrical engineering.

He has been employed in the past as a Navy Systems and Instrumentation Engineer and has designed microwave components and antennas.

He has also been an Instructor in Electronics and has held positions as a Research Fellow and Associate, while in graduate school. He joined the U.S. Environmental Protection Agency, Office of Research and Development, in 1971, and is currently engaged in research activities associated with EPA's program of nonionizing radiation at Research Triangle Park, NC. His present interests include interactions of electromagnetic energy with biological media, UHF-microwave exposure techniques, and dosimetric methods.

Dr. Weil is a member of Sigma Xi, the International Microwave Power Institute, and the Bioelectromagnetics Society.



Clive Winkler (M'72) was born in Adelaide, South Australia, on December 3, 1947. He received the B.Sc. and B.E. degrees from the University of Adelaide in 1968 and 1969, respectively, and the Ph.D. degree in applied mathematics from the Australian National University, Canberra, in 1978.

From 1970 to 1975 he was a research scientist for the Australian Department of Supply carrying out research into radar system counter-measures. From 1975 to 1978 he became a

graduate student and his thesis was on theoretical aspects of optical fibre technology. He joined the Australian Department of Defense in 1978 and is currently working on VHF radio wave guidance in equatorial plasma bubbles.