DR. LAWRENCE G. PIPER

Dr. Piper studied at Oberlin College from which he received his A.B., cum laude, with a major in chemistry, in 1967. He undertook his doctoral research with Prof. John Ross in the Department of Chemistry at the Massachusetts Institute of Technology from 1967-1971. Subsequent to obtaining his Ph.D. in 1971, Dr. Piper embarked upon a series of post-doctoral research appointments under the influence, successively, of Prof. Donald W. Setser of Kansas State University, Dr. Michael A.A. Clyne of Queen Mary College in London, and Prof. Frederick Kaufman of the University of Pittsburgh.

Since joining Physical Sciences in July 1976, Dr. Piper has set up a kinetics facilities both at PSI and at the Air Force Geophysics Laboratory in Bedford, MA. These facilities include several fast flow reactors and a laser photolysis system. They have been used to study the photolytic and pyrolytic decomposition of various energy-rich compounds such as azides, as potential sources of visible chemical lasers, set up a fast-flow kinetics facility for the product formation in reactions of atmospheric species with metastable nitrogen atoms and molecules, the kinetics of atomic and molecular nitrogen metastables, including vibrationally excited ground-state nitrogen, the pumping of halogens by metastable nitrogen species, and the effluents of He/N_2, Ar/N_2, and Ar/N_2O discharges. He has also established electronic transition moment variations and Einstein coefficients for a number of important molecular transitions including N_2(B-A), N_2(A-X), N_2^+(B-X), NO(A-X), NO(B-X) and IF(B-X).

More recently, Dr. Piper has been developing applications of dielectric-barrier discharge technology to the detection and remediation of hazardous wastes. Additional experimental activities include developing radiometric techniques for determining surface temperatures of laser-heated materials on a nanosecond time scale; investigating excitation and quenching processes in electron-beam irradiated nitrogen, oxygen, and air; determining methods for remote decontamination of cryogenic optics; and developing laser-based techniques for monitoring wind-tunnel turbulence.

Dr. Piper has authored or co-authored more than 70 articles for publication in the open literature in addition to more than 100 conference presentations and technical reports. His publishable work has been in the areas of electronic and vibrational energy-transfer processes, atomic and molecular spectroscopy, chemical kinetics, infrared chemiluminescence, molecular beams, and hazardous waste detection.