

# JAMES SAMUEL MCKNIGHT, PH. D.

ENGINEER

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## Education

Doctor of Philosophy, Duke University (1969). Thesis title: "The Submillimeter Microwave Spectrum of Oxygen." Fields of study: physics, major, and mathematics, minor.

Master of Science, Duke University (1962). Thesis title: "A Meter for Quantitatively Evaluating Tremor in Parkinson's Disease." Fields of study: electrical engineering, major, and physics and mathematics, minor.

Bachelor of Science in Electrical Engineering, Duke University (1960).

## Experience

Conducted engineering investigations of property damage and personal injuries. The investigations have included electrocutions; electrical burn injuries; the effects of electricity on the human body; lightning damage; static electricity discharges; mechanical and electrical equipment failures; industrial, commercial, and residential fire damage; manufacturing process failures; gas explosions; and automobile battery explosions. Self-employed (from 1985) and Research Engineers, Inc., Research Triangle Park, North Carolina (1978 to 1985).

Designed a graphic moving map display and evaluation experiments for use by aircraft for the improvement of air traffic control in terminal areas; performed studies on the implementation of advanced navigational aids for aircraft in terminal areas, including use of a microwave landing guidance system and area navigation computers; prepared training courses in occupational safety, including coordination with consultants and client; developed and applied special photogrammetric techniques for the measurement of aircraft altitude; designed, constructed, and evaluated a prototype large underground fallout shelter utilizing existing mine space; analyzed the effects of transient conditions of operation on steam-electric generation plants; and, performed noise assessments in planning land use. Research Triangle Institute, Research Triangle Park, North Carolina (1973 to 1978).

Designed electrical and mechanical facilities and monitored their construction (facilities included plants and equipment for the generation and distribution of electrical power, for indoor and outdoor lighting, and for municipal water and wastewater utilities); and, taught electrical principles in a school for wastewater treatment plant operators. Olsen Associates (Engineers and Architects), Raleigh, North Carolina (1972 to 1973).

Taught undergraduate courses in electricity and magnetism, electromagnetic field theory, atomic and nuclear physics, electronics, thermodynamics, general physics for science majors, advanced applied mathematics, introductory mathematics, geophysics, and introductory physics with topics for special appeal to students from other disciplines. Davis and Elkins College, Elkins, West Virginia. Assistant Professor (1969 to 1972).

Conducted research on the use of microwave radiation to stimulate or make specific lesions in the central nervous system. Division of Neurosurgery, West Virginia University Medical Center, Morgantown, West Virginia (1971).

Conducted electron paramagnetic resonance studies of single crystals. United States Army Research Office-Durham, Durham, North Carolina (1969).

## **Professional and Honorary Associations and Recognitions**

Eta Kappa Nu

Tau Beta Pi

Society of the Sigma Xi

American Physical Society

National Fire Protection Association

Senior Member, Institute of Electrical and Electronics Engineers

American Men and Women of Science

Who's Who in Science and Engineering

Who's Who in the South and Southwest

## **Professional Engineering Registration**

North Carolina and Missouri

## **Publications**

“Cockpit Display of Traffic Information” (with C.L. Britt, Jr., R.J. Montoya, and C.M. Davis). NASA CR 145340. National Aeronautics and Space Administration, Langley Research Center, Hampton, Virginia (May 1978).

“Study of the Impact of Air Traffic Management Systems on Advanced Aircraft and Avionics Systems” (with C.L. Britt, Jr., R.J. Montoya, C.M. Davis, L.K. Edmonds, and C.F. Ware). NASA CR-145241. National Aeronautics and Space Administration, Langley Research Center, Hampton, Virginia (October 1977).

“Training for OSHA Safety Specialist/Engineers, Segment 12: Construction.” Contract No. J-9-F-0134. Occupational Safety and Health Administration Training Institute, United States Department of Labor, Des Plaines, Illinois (October 18, 1977). Lecture notes, visual aids, and related educational materials on safety in electrical construction, in the use of portable hand tools, and in other areas of construction safety.

“Mine Lighting and Ventilation in Crises” (with M.D. Wright, E.L. Hill, and S.B. York, III). DCPA01-74-c-0266. Defense Civil Preparedness Agency, Washington, D.C. 20301 (October 1975).

“Effects of Transient Operating Conditions on Steam-Electric Generator Emissions.” EPA-600/2-75-022. Office of Research and Development, United States Environmental Protection Agency, Washington, D.C. 20460 (August 1975).

“Microwave Rotational Spectrum of HCCD” (with Walter Gordy). *Bulletin of the American Physical Society* 14, 621 (1969).

“Measurement of the Submillimeter Wave Rotational Transition of Oxygen at 424 kMc/sec” (with Walter Gordy). *Physical Review Letters* 21, 1787 (1968).

“A Meter for Quantitatively Evaluating Tremor in Parkinson's Disease.” Conference Paper No. 63-651. IEEE Region 3 Meeting, Richmond, Virginia (April 24-26, 1963).