

**MEMORIAL RESOLUTION**  
**CHANCELLOR'S PROFESSOR EMERITUS GEORGE EWING**  
**(November 28, 1933 – August 23, 2011)**

George Edward Ewing was born November 28, 1933, in Charlotte, North Carolina to Allen Conover Ewing and Margaret M. Ewing. He was married to Louise S. Ewing of Williamsport, Pennsylvania. He graduated high school from the Phillips Exeter Academy in 1952, completed his undergraduate work at Yale University in 1956 (where he most enjoyed being a member of the Mountaineering Club), and received his Ph.D. from the University of California, Berkeley. Upon graduation, he worked for Jet Propulsion Laboratories in Pasadena, California and then at Bell Laboratories in Murray Hill, New Jersey, before joining the faculty at Indiana University in 1963. George believed his most valuable education came from his parents, family, teachers and friends. Side-stepping mention of his elite schools was a manifestation of George's vigorous allergy to pretentiousness.

George was one of the last to be stuck with the tradition of beginning a tenure-track appointment as an Instructor. Within only eight years, he became a full professor. George retired in 1998 as a Chancellor's Professor of Chemistry and a Professor of Public and Environmental Affairs. Over the years, he and his students studied the chemical and physical properties of molecular complexes, liquids, surfaces, atmospheric particles and ice, resulting in over one hundred papers. Thousands of students have studied with him, ranging from undergraduate non-majors to chemistry Ph.D. candidates.

George's academic career was a tight integration of teaching and research; he excelled at both. A formal recognition of George's innovative teaching is given by his Chancellor's Professorship. His teaching spanned courses ranging from our most elementary offering for first year non-science majors to graduate quantum mechanics and spectroscopy. A student from the junior-senior physical chemistry course wrote:

*"We called him the P-Chem Guru based on the rather wild look of his hair after he walked into the classroom and pulled his sweater off over his head. He would generally have his notes rolled up in a pocket. He would remove them from the pocket and never look at them. On one particularly memorable occasion, after introducing his main ideas of the wavefunction and quantum theory to us, he turned to the class and said, 'And now there will be an embarrassing silence until someone asks a question.' And he waited for the question – something not many professors were inclined to do. My decision to pursue physical chemistry as a career was cemented in his class."*

Formal recognition of his research is found in his election as a Fellow of the American Physical Society, Directeur des Recherches (École Polytechnique, France), his Guggenheim Fellowship (Oxford, England) and his visiting sabbatical appointments at top research institutions worldwide: Bell Telephone Labs, École Polytechnique (France), Oxford University (England), (Indiana University); Chapman Lecturer (University of Alaska) and Quatercentenary Visiting Fellowship (Cambridge, England), and the Technion (Israel). His last sabbatical was as the Chapman Lecturer at the University of Alaska in pursuit of his research interest on ice.

George directed more than thirty Ph.D. students and almost an equal number of postdocs. They organized a Festschrift for George at the time of his retirement and returned to Bloomington from as far away as Europe.

The accomplishments of his lab, the “quantum garage,” were as familiar to those overseas as in the US. He would first choose a topic little studied by others (thus he didn’t have to read the literature, so he said), and when it became crowded, he moved on.

One can trace the evolution of his research through at least five distinct areas. His initial IU work involved weakly bound molecules, so-called van der Waals molecules, such as the dimer formed from two ordinary oxygen molecules. He started when there was skepticism even about their existence. With a unique cryogenic apparatus ( $-200^{\circ}\text{C}$ ) created to maximize the small concentration expected of such fragile complexes, he published in 1971 the first IR study of the dimer, confirming not only its existence but reporting its bond strength and geometry.

Soon this field became hot, and he moved to the different world of energy transfer in liquids. At the time, a central issue was the time scale for vibrational energy loss from a molecule such as molecular nitrogen that was undergoing a trillion collisions per second in its liquid nitrogen environment. The time scale for loss of a vibrational quantum in this collisional mayhem was commonly thought to be on the order of a billionth of a second. Using state of the art laser technology in 1975, he discovered the time scale to be a little longer. It was about one second! George’s paper revolutionized concepts of liquid state energy transfer.

George revisited van der Waals complexes as a theorist. The issue was again one of time scales, but now the process was the breaking of the weak bond after one of the chemically bound molecules became vibrationally energized. He developed in 1979 “the momentum gap” methodology for prediction of the time scales that still remains in common use for several types of energy transfer processes.

His developments next lead George to predictions concerning molecules weakly bound to surfaces. The surface of the NaCl crystal, an insulator, was a useful model. Once again, this

was a nearly virgin field since little attention had been paid to insulator surfaces. The work eventually led to another of George's papers now considered a classic.

This experience led George to studies of small atmospheric particles, mostly sea salt suspended in air. He developed a unique method to gain access to these aerosols via IR spectroscopy that has been adopted by other labs for diverse atmospheric research. This experience also led to George's service on The Indiana Air Pollution Control Board. It also stimulated George's interest in the thin films of water that cover most surfaces under ambient conditions and his fascination with properties of ice that he pursued during a winter sabbatical in Fairbanks, Alaska.

Most recently George became deeply involved with Professor Martin Jarrold concerning the mechanism of electric charge build up in the atmosphere. That problem has been with us for a long time, say, several hundred years, so that it violates George's propensity to go after problems with a minimal literature. Still, significant issues remain unresolved. Obviously, George was intellectually restless.

George loved the city of Bloomington and especially the woodlands and countryside of southern Indiana. He had a passion for walking and spent much time in Brown County's Yellowwood State Forest and on Pate Hollow Trail in Hoosier National Forest. He was a regular at his favorite local haunts including Soma, the Runcible Spoon, Laughing Planet, Uptown Cafe, the Monroe County Public Library and the late Ladyman's Cafe. He appreciated Bloomington's many cultural offerings such as the Art Museum and enjoyed evening strolls to musical and theatrical events. He volunteered as a cook in the Hunger Relief Program at the Shalom Community Center, was concerned about environmental quality and served on the Air Pollution Control Board for the State of Indiana, was a member of the Bloomington Coalition for Death Penalty Issues and a longtime member of the Religious Society of Friends (Quakers). Always an active man, he became a yoga enthusiast in his later years.

George Edward Ewing, 77, of Bloomington, passed away on Tuesday, August 23, 2011, at home with his loving family after a long illness. George was a devoted family man and will be missed by his wife, Louise; four daughters, Alice Ewing of San Diego, California, Christina Hamilton of Ann Arbor, Michigan, Tamara S. Ewing and husband of Nantes, France, and Sasha MacKenzie and husband of Naples, New York; two sons, James Ewing and wife of Brooklyn, New York, and Ross Ewing of Bloomington; four grandchildren, Luther and Josephine Hamilton, Tea and Emile Hazebrouck. He is preceded in death by his mother and father, and survived by his two sisters Susan Fisher and Katherine Ewing.

In recognition of Professor Emeritus George Ewing's many contributions to the scientific and scholarly life of the Department of Chemistry, the community and to the university at large,

be it resolved that this memorial resolution become part of the permanent records of the proceedings of the Bloomington Faculty Council.

Cathrine E. Reck  
Clinical Associate Professor of Chemistry