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In Memorium

James H. Crawford, Jr.

James Homer Crawford, Jr., professor in the Department of Physics and Astronomy and the first chairman of the Curriculum in Applied Science, University of North Carolina, died unexpectedly on October 20, 1984, at the age of 62.

Crawford was an active member of MRS. He was one of the chairpersons of the 1983 MRS symposium on Defect Properties and Processing of High-Technology Nonmetallic Materials, an invited speaker at several MRS symposia, and instrumental in the formation of the North Carolina Local Section of MRS.

Jim was born in Union, SC, on May 19, 1922. After receiving a BS from Wofford College and serving in the U. S. Army in World War II, he earned a PhD in the Department of Chemistry, University of North Carolina. In 1968 Wofford College awarded him an honorary DSc degree. During the period 1949-1967, Jim was a scientist at the Oak Ridge National Laboratory. He rose to the position of associate director of the Solid State Division where he conducted extensive research on the effects of high-energy radiation on the electrical and the structural properties of crystalline and glassy solids. This work included pioneering investigations of the effects of fast neutrons and gamma rays on semiconductors. Along with related efforts by Lark-Horovitz' group at Purdue, these experiments provided the first detailed information on the electron donor/acceptor states due to point defects in germanium and silicon. An early authoritative discussion of these effects was presented in the book Radiation Damage in Solids, which Crawford co-authored with Douglas Billington in 1961.

Crawford returned to North Carolina in 1967 to serve as chairman of the Department of Physics and Astronomy at the University at Chapel Hill, a post which he held for 10 years. He returned to full-time teaching and research in 1977, and recently had become the first chairman of a new cross-disciplinary curriculum in applied science.

During his tenure at UNC, while cheerfully and effectively giving his time to a wide variety of University duties, Crawford maintained a vigorous and internationally recognized program of research on lattice defect phenomena in ionic crystals. His work on lattice imperfections and ion transport in doped fluorite-type crystals enhanced our understanding of the structure and dynamics of defect complexes in these materials and thereby also gave valuable insights into the behavior of conventional nuclear fuel materials, which are less amenable to experimental study but which have analogous crystal structures and defect properties.

During recent years, his interests were focused on the effects of high-energy radiation on crystalline oxides and on the complex color center interactions in these materials. This is a problem which is both scientifically significant and also has great technological and societal import, in connection with the design of ceramic "front wall" for the nuclear fusion power reactor of the future.

The success and vigor of Crawford's research program are attested to, not only by the large volume of his publications (some 130 papers), but also by the fact that he was frequently invited to give review lectures and to serve on organizing committees of international conferences. Crawford was a Fellow of the American Physical Society and had at various times been editor of the Journal of Applied Physics (1960-1964), chairman of the Task Force on Dissemination of Scientific and Technological Information (for the President's Scientific Advisory Committee), chairman of the Advisory Panel for Physics of the National Science Foundation, member of the National Materials Advisory Board of the National Research Council, and chairman of the Southeastern Section of the American Physical Society. It was abundantly clear to those of us who worked with him that Jim Crawford was loved and admired by a host of former students, colleagues, and scientists around the world.

*E. Merzbacher
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