

## **J. David Litster**

James David Litster received a bachelor's degree in engineering from McMaster University in Hamilton Ontario, Canada and a Ph.D. in physics from MIT. He was appointed to the faculty at MIT in 1966 and became Professor of Physics in 1975. Litster's research interest has been the experimental study of phase transitions in unusual states of matter, using primarily light scattering and high-resolution X-ray scattering. His early work involved measuring precisely the scaling equation of state of a ferromagnet near its critical point, which lead to development of a phenomenological equation of state for magnets and fluids in the vicinity of their critical point. He has also carried out light scattering studies to elucidate the nature of the nematic-isotropic transition in liquid crystals, and combined light scattering and X-ray scattering investigations of the establishment of smectic-A order in liquid crystals.

More recently, his research involved the first experimental demonstration of quasi-long-range order (the Landau-Peierls state) in condensed matter; this was done in the three-dimensional situation of a smectic-A liquid crystal, which is a one-dimensional density wave in a three-dimensional liquid. Analogous behavior has since been demonstrated in two dimensional solids. Other significant work includes the quantitative study of bond orientational order in smectic liquid crystals. This was the missing idea needed to have a description of the structure of liquid crystal phases. He was awarded the 1993 Irving Langmuir prize for his work by the American Physical Society.

From 1991 through 2001, Litster was Vice President and Dean for Research at the Massachusetts Institute of Technology, where his responsibilities included setting the Institute's research policies. MIT's technology licensing and commercialization activities reported to his office. Litster has also been Director of the MIT Center for Materials Science and Engineering and the Francis Bitter National Magnet Laboratory at MIT. After two five-year terms as Vice President and Dean for Research he returned to full-time teaching and research, and has recently been devoting time and energy to teaching first year electricity and magnetism in a technologically enhanced studio format while developing a course to teach first year mechanics in the same format.

Litster is an outside director and a member of the audit committee of Novellus Systems, Inc., San Jose California. He is a fellow of the American Physical Society, the American Academy of Arts and Sciences, and of the American Association for the Advancement of Science.