Research in the Metal Organic Chemical Vapor Deposition group is two-fold. First, they develop new molecular metal-organic precursors targeted for thin film growth by metal-organic chemical vapor deposition (MOCVD). These precursors must be volatile, low-melting, monomeric complexes of the metals desired. Additional desirable characteristics for potential MOCVD precursors include thermal stability, non-toxicity, and a high-temperature decomposition pathway that leads to zero ligand incorporation into the growing film at the heated substrate interface. The second component of the groups' research is identifying metal oxide films of interest to the materials science community, and demonstrating in-house the MOCVD growth of these films using the precursors developed in the laboratory.

The Molecular Electronics group focuses their research on the synthesis and study of thin-film and molecular electronic materials, concentrating on the versatile thiophene-based oligomers and polymers as semiconducting and conducting layers. Applications include thin-film transistors, supercapacitors, conductive layers in organic LED's, and transparent conductive organic materials. They also address fundamental questions of electronic structure, optical properties, and charge-transport mechanism in materials through combined synthetic and theoretical research in collaboration with Professor Ratner. This research produces new design rules for next-generation high-performance organic electronic materials.

## Schedule

**3:30 - 4:00 PM** Reception for Dr. Marks. Enjoy refreshments and informal conversation with our speaker in Room CP-137.

**4:00 PM** Introduction of our speaker by Professor Bruce Hinds.

**4:00 - 5:00 PM** Professor Tobin Marks, Department of Chemistry, Northwestern University, Evanston, IL
*Self-Assembly Processes for Constructing Unconventional Organic, Organometallic, and Inorganic Electronic Circuitry*

The Department of Chemistry wishes to acknowledge the generous support of the Lyle Ramsay Dawson Lecture Series by Venita Dawson Curry.

All events are being held in the University of Kentucky's Chemistry-Physics Building. Maps of the campus and parking information are available on the web at:
www.uky.edu/CampusGuide/

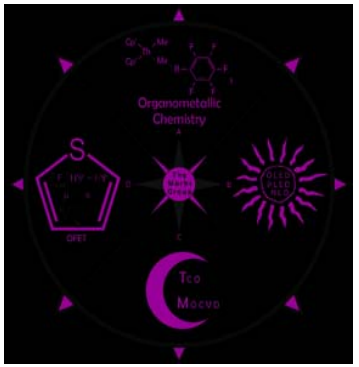
For more information on the Dawson Lecture Series visit our web site at:
www.chem.uky.edu/seminars/

Questions and comments can be directed to Prof. Robert Grossman, (859) 257-1285, robert.grossman@uky.edu.

**The Thirteenth Annual**

# Lyle Ramsay Dawson Lecture

established in memory of
**Professor Lyle Ramsay Dawson**
Distinguished Professor and former
Chair of the Department of Chemistry




*Self-Assembly Processes for Constructing Unconventional Organic, Organometallic, and Inorganic Electronic Circuitry*

**Professor Tobin Marks**
Northwestern University

**Friday, October 2, 2009**
**4:00 PM**

**Chemistry-Physics Building**
**Room CP-139**
**Department of Chemistry**
**University of Kentucky**
**Lexington, Kentucky**

**Lyle Ramsay Dawson** was a native of Illinois and received his undergraduate degree from the University of Illinois in 1932. He received his Ph.D. degree in 1935 from the University of Iowa.

Dr. Dawson served in several academic positions in Illinois, Wisconsin, Nebraska and Louisiana and also worked on the Manhattan project as a Research Chemist and Group Leader in the Metallurgical Laboratory at the University of Chicago. In 1946, he was awarded the War Department's Certificate of Merit and a U.S. patent for his efforts on the Manhattan project which led to the discovery of a fundamental process for the extraction and purification of the elements plutonium and neptunium. He was a member of the committee that organized the Oak Ridge Institute of Nuclear Studies and was a council member of the Institute.

Professor Dawson came to the University of Kentucky in 1945 as Chair of the Department of Chemistry. He provided key leadership in initiating and building the doctoral program in Chemistry at the University. For example, in his first decade in the department, he individually obtained the major portion of extramural research support. During his twenty-five years with the Department, he held contracts for fundamental chemical research with the U.S. Army, the National Science Foundation and the Atomic Energy Commission.

He directed or codirected seventeen Ph.D. dissertations and nine M.S. theses. He was a talented research director and had a special ability to imbue his students with a concise, clear and complete scientific writing style. He published more than fifty research papers dealing with the chemistry of nonaqueous solutions and coauthored a reference book on the subject.

Dr. Dawson was a master teacher both in the classroom and in less formal conferences and discussions. His leadership and mentoring led many graduate teaching assistants and junior faculty members to become more effective teachers. His uncompromising devotion to high achievement standards in coursework, research, education and training set the tone for our department for years to come.

Another significant contribution to the Department was Professor Dawson's indefatigable advocacy for a new chemistry building. His leadership in soliciting and designing a replacement for the former chemistry building, Kastle Hall, culminated in the opening of the current Chemistry-Physics Building in 1963.

He also served the campus community in other ways. Dr. Dawson was elected a Distinguished Professor in the College of Arts and Sciences in 1954-1955, and was appointed to the rank of Distinguished Professor in the field of Physical Chemistry by the University of Kentucky Board of Trustees in 1956. He served as Acting Dean of the Graduate School in 1954-1955, 1956 and 1960-1961.

Dr. Dawson's contributions outside the University were well recognized. He was a Fellow of both the American Institute of Chemists and the American Association for the Advancement of Science. He was a member of the American Chemical Society, Electrochemical Society, Sigma Xi, Omicron Delta Kappa, Alpha Chi Sigma and Kappa Delta Pi, serving leadership roles in each of these organizations. He served several times as a Tour Lecturer and Visiting Scientist under the sponsorship of the American Chemical Society. He was also active in a variety of other nonacademic organizations.

Dr. Dawson's twenty-five years in the department represent a truly outstanding combination and balance of administrative leadership, teaching, research and service. Although Dr. Dawson passed away in 1976, his impact on the department continues to this day as we continue our evolution into a top-twenty research institution. The endowment of the Lyle Ramsay Dawson Lecture Series by his beloved daughter, Venita Dawson Curry, permits us to rejoice in this legacy and to continue our tradition of world-class chemical research.

**Tobin J. Marks**. Charles E. and Emma H. Morrison Professor of Chemistry, Professor of Materials Science and Engineering, Vladimir N. Ipatieff Professor of Catalytic Chemistry. Professor Marks received a B.S. degree from the University of Maryland in 1966 and a Ph.D. from Massachusetts Institute of Technology in 1970. He has contributed to numerous publications and won several awards. Recently Dr. Marks received the 2009 Von Hippel Award from the Materials Research Society, the society's highest award. He was also selected as the 2010 William H. Nichols Medalist, one of the oldest and most prestigious chemistry awards in the nation.

**Principal Research Interests**

Research in Dr. Marks' group is generally divided into four teams that each have a unique research focus. Each subgroup focuses on one of the following: Organometallics, Molecular Photonics, MOCVD, and Molecular Electronics. The Organometallic group research concerns the design, synthesis, and characterization of early transition metal complexes and main group reagents for generating highly electrophilic polymerization catalysts. Closely connected studies focus on new polymerization processes and polymeric materials, such as functionalized, branched, and heteroatom-connected polyolefin chains.

The Molecular Photonics group research involves the synthesis and study of thin-film photonic materials, both for producing organic electroluminescent materials and nonlinear optics to double or modulate light in optical data transmission. These materials are made using nanoscopic self-assembled techniques, producing a robust molecular assembly. In addition to characterization and synthesis, the theory of molecular photonic processes is studied in collaboration with Professor Ratner.