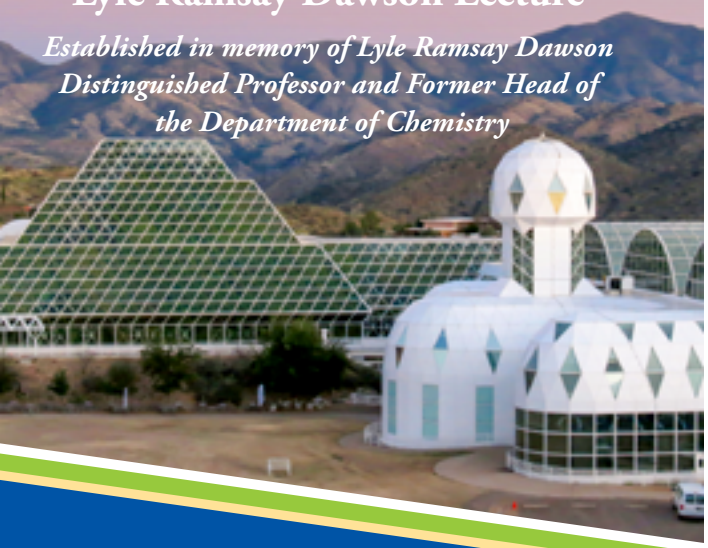
The 22nd Annual
Lyle Ramsay Dawson Lecture

Established in memory of Lyle Ramsay Dawson Distinguished Professor and Former Head of the Department of Chemistry



Interface Science of Emerging Solar Cell Technologies

N.R. Armstrong
Regents Professor of Chemistry/Biochemistry/
Optical Sciences at the University of Arizona

Friday, October 12, 2018 | 4:00 PM
Don & Cathy Jacobs Science Building, Rm 321
**Reception to immediately follow.*

University of Kentucky

Lecture abstract

The U.S. has entered a new phase of how energy generation portfolios are determined, driven by an abundance of low-cost natural gas and explosive growth and dramatically falling prices for electricity generation from renewable energy sources such as utility scale photovoltaics (PV) and wind. Regions of the U.S. with high solar fluence and wind resources (with a combined population of ca. 70M people) are projected to produce up to 50% of their electricity from PV and wind by 2030, in parallel with the retirement of older fossil fuel generating stations. These dramatic changes, however, come at a time of unprecedented "water stress" to these same communities, which is driving the need to look at new ways of acquiring, conserving, purifying and reusing "fit for purpose" water. Low cost thin film solar cells have entered the picture as a potential pathway to electricity generation that provides for their integration into buildings (BIPV) and even greenhouses, where food can be grown in efficient, low-water and energy use, controlled environments with semi-transparent solar cells as both a window and an energy source. In this talk we'll review what life (and "energy/water stress") is like in an arid U.S. environment, show some of the emerging semi-transparent thin film solar cell technologies (being integrated into greenhouses) that our interface science program has been supporting, and finally more tightly focus on some of the nanometer scale interface science issues that have to be addressed to ensure that these technologies really matter to our energy future.

N.R. Armstrong

Neal Armstrong is a Regents Professor of Chemistry/Biochemistry/Optical Sciences at the University of Arizona, where he has been a faculty member since 1978. His program has focused almost exclusively on the interface science, at nanometer length scales, of emerging technologies such as organic light emitting diodes (OLEDs), thin film solar cells (OPVs and perovskites), and thin film chemical sensing technologies. More recently he has been focusing on how these technologies can be integrated as solutions to key problems that arise in water-stressed environments (like Arizona).

LYLE RAMSAY DAWSON

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 Head 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 co-directed 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 course-work, 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. 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.

Questions and comments about the Dawson Lecture can be directed to Dr. Kenneth Graham.
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