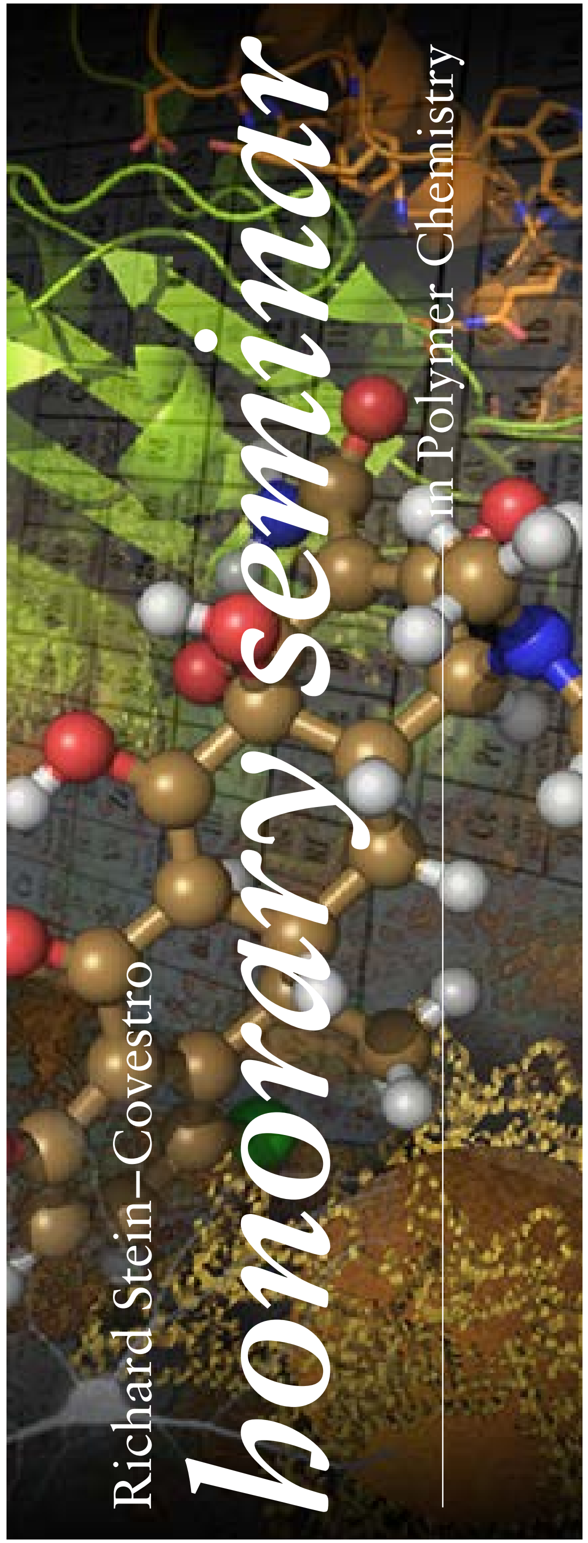
The Department of Chemistry, University of Massachusetts Amherst
presents

PROFESSOR JEFFREY S. MOORE

University of Illinois at Urbana-Champaign
Department of Chemistry and
The Beckman Institute for Advanced Science & Technology

"Materials Functions for Polymer Lifecycle Control"

Thursday, October 1, 2020
11:30 a.m., Zoom



Covestro is guided by a simple and powerful purpose: **to make the world a brighter place.** The company focuses on innovation and sustainability to develop premium polymer materials that benefit society and coming generations.

With its materials and application solutions found in nearly every area of modern life, Covestro is among the leading suppliers of high-performance polymers. Covestro develops sustainable solutions to the greatest challenges of our age: climate change, resource depletion, urban expansion, and population growth. These concerns will inevitably lead to a higher demand for renewable energies, alternative resources, energy-efficient transportation, and sustainable, affordable housing.

Covestro aims to meet this demand with long-lasting, light, environmentally friendly and cost-effective materials, which in many cases are suitable replacements for conventional materials such as steel and glass. The main segments served are the automotive, electrical and electronics, construction, medical, sports, and leisure industries.

At the backbone of their organization's success are its 17,200 employees, who work at around 30 sites across the globe – from smaller technical centers and innovation hubs, to large-scale production plants. Covestro's activities are coordinated from its corporate headquarters in Leverkusen, Germany. More at www.covestro.com.

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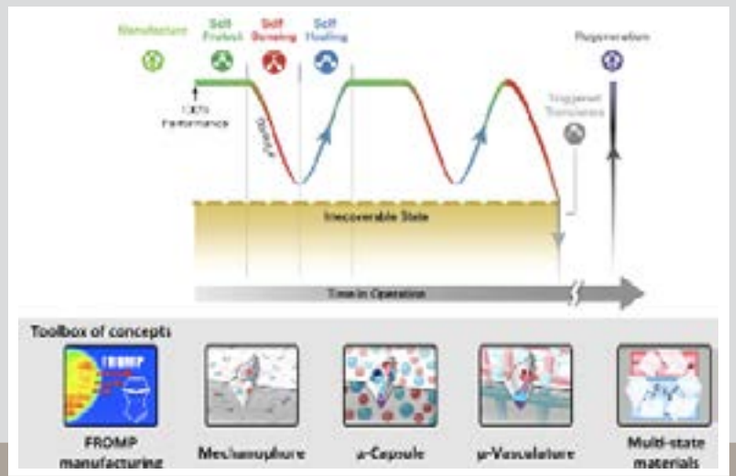
Jeffrey**Moore**

JEFFREY MOORE received his B.S. in chemistry (1984) and Ph.D. in materials science and engineering with Samuel Stupp (1989), both from the University of Illinois. He then went to Caltech as a National Science Foundation Postdoctoral Fellow working with Robert Grubbs. In 1990, he joined the faculty at the University of Michigan in Ann Arbor and in 1993 returned to the University of Illinois, where he is currently the Stanley O. Ikenberry Endowed Chair, Professor of Chemistry, as well as a Professor of Materials Science & Engineering. Jeff is a member of the National Academy of Sciences and a fellow of the American Academy of Arts & Sciences, the American Association for the Advancement of Science and the American Chemical Society (ACS); he has received the Campus Award for Excellence in Undergraduate Teaching and has been recognized as a "Faculty Ranked Excellent by their Students." For 14 years he served as an associate editor for the Journal of American Chemical Society. In 2014, he was selected as a Howard Hughes Medical Institute Professor and in 2016 was chosen as the recipient for the ACS Edward Leete Award in Organic Chemistry. He received the Royal Society of Chemistry's Materials Chemistry Division 2018 Stephanie L. Kwolek Award. He has published over 400 articles covering topics from technology in the classroom to self-healing polymers, mechanoresponsive materials and shape-persistent macrocycles. He is currently serving as the Director of the Beckman Institute for Advanced Science and Technology at the University of Illinois.

ABSTRACT

In this talk I will discuss the molecular design of organic structural materials that mimic living systems to protect, report, heal and even regenerate themselves in response to damage, with the goal of increasing lifetime, safety and sustainability of many manufactured items. I will emphasize recent developments in frontal ring-opening metathesis polymerization (FROMP) to manufacture composites with minimal energy consumption. FROMP is an energy efficient bulk polymerization method with a traveling reaction boundary. Depending on intrinsic reactivity and boundary conditions, FROMP persists in stable and unstable modes of propagation. I will discuss opportunities for pattern generation by taking advantage of the unstable modes.



RICHARD STEIN was born in Far Rockaway, New York in 1925. He was an undergraduate at Brooklyn Polytechnic, where he made some of the first light scattering studies of the dimensions of polymers in solution. He received his PhD from Princeton for work with Professor Tobolsky on using birefringence and X-ray diffraction to study polymer orientational relaxation. He then spent a postdoctoral year at Cambridge University to extend his studies using infrared dichroism. Stein joined the University of Massachusetts Chemistry faculty in 1950, where he began his pioneering studies into the development of rheo-optical techniques for studying orientation and phase transition phenomena in amorphous, crystalline and liquid crystalline polymers. Stein initiated the Polymer Science and Engineering Department and now serves as Emeritus Goessmann Professor in Chemistry. He has over 400 publications, and has been consulting for companies such as Monsanto and Bayer for over 45 years.

Dr. Stein's efforts have been recognized by awards from the American Chemical Society, the American Physical Society, the Society of Rheology, the Society of Plastics Engineers, the Society of Polymer Science in Japan, and the Plastics Hall of Fame. In 1999, the Materials Research Society conferred on him its highest honor, the Von Hippel Award. He received a Distinguished Alumni Award from Polytechnic University in Brooklyn, and has been awarded three honorary doctorates. Dr. Stein was named to the National Science and National Engineering Academies, as well as the American Academy of Arts and Sciences. He was a member of the first delegation in Chemistry to the People's Republic of China.

Professor Stein is still actively involved in research. He was a founder of the Pioneer Valley Biochar Initiative, a member of the Planning Committee for the North American Biochar Symposium in 2013, and co-organizer of the UMass contribution to the National Teach-In for Global Warming Solutions, and of the New England Biochar Symposium, in 2009. He gives public lectures on the topic, and in 2011, he co-authored a book titled "The Energy Problem." In June of 2014, Prof. Stein was presented with a certificate of Congressional Recognition for his outstanding service to UMass and to the community. In August of 2015, Senator Rosenberg presented Prof. Stein with an official Joint House Senate resolution recognizing his many accomplishments and contributions to the Commonwealth.

Richard **Stein**