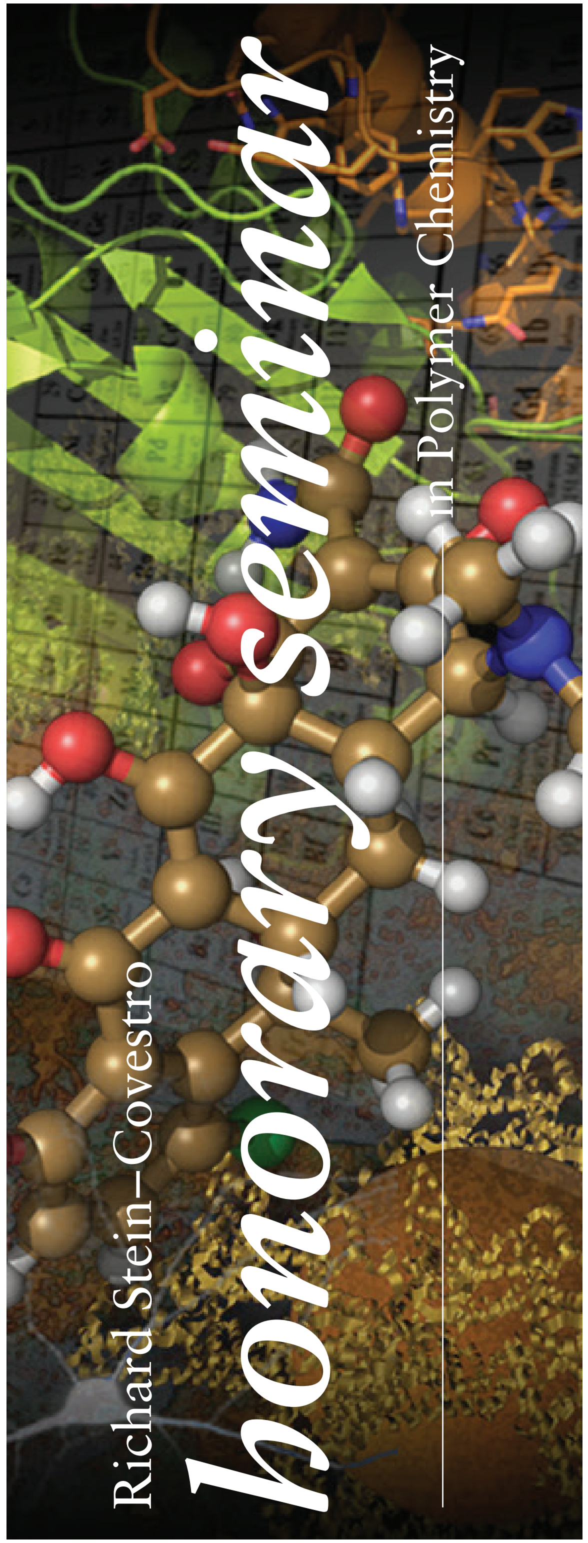
The Department of Chemistry, University of Massachusetts Amherst
presents

PROFESSOR TIMOTHY P. LODGE

University of Minnesota
Department of Chemistry and Department of Chemical Engineering & Materials Science

"Ionic Liquid/Block Polymer Nanostructures: Remarkably Versatile, Functional Materials"

Thursday, September 5, 2019
11:30 a.m., 1634 LGRT
Refreshments at 11:00 a.m.



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 16,800 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, with sales of more than €14.6 billion in 2018. More at www.covestro.com.

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Professor Karen L. Wooley, 2017-2018
Prof. Krzysztof Matyjaszewski, 2016-2017
Professor Mitch Winnik, 2015-2016
Professor David A. Tirrell, 2014-2015
Professor Christopher Ober, 2013-2014
Professor Frank S. Bates, 2012-2013
Dr. Mohan Srinivasarao, 2011-2012
Professor James Heath, 2010-2011
Dr. Catherine Coleman, 2009-2010
Professor Edwin L. Thomas, 2008-2009
Professor George Whitesides, 2007-2008
Professor Julia Kornfield, 2006-2007
Professor Jean M.J. Fréchet, 2005-2006
Professor Samuel Stupp, 2004-2005
Dr. Craig J. Hawker, 2003-2004
Dr. Richard Turner, 2002-2003
Dr. Elsa Reichmanis, 2001-2002
Dr. Robert Langer, 2000-2001
Professor Robert H. Grubbs, 1999-2000
Professor Herbert Morawetz, 1998-1999
Dr. Robert L. Kruse, 1997-1998

Timothy**Lodge**

TIM LODGE graduated from Harvard in 1975 with a B.A. cum laude in Applied Mathematics. He completed his PhD in Chemistry at the University of Wisconsin in 1980, and then spent 20 months as a National Research Council Postdoctoral Fellow at NIST. Since 1982 he has been on the Chemistry faculty at Minnesota, and in 1995 he also became a Professor of Chemical Engineering & Materials Science. In 2013 he was named a Regents Professor, the University's highest academic rank.

He has been recognized with the American Physical Society (APS) Polymer Physics Prize (2004), the International Scientist Award from the Society of Polymer Science, Japan, (2009), the 2010 Prize in Polymer Chemistry from the ACS, and the Hermann Mark Award (2015) and the Paul Flory Education Award (2018) of the ACS Division of Polymer Chemistry. He has been elected to Fellowship in the American Association for the Advancement of Science, the APS, the ACS, and the Neutron Scattering Society of America. In 2016 he was elected to the American Academy of Arts and Sciences.

From 2001–2017 Tim served as the Editor of the ACS journal *Macromolecules*. In 2011 he became the founding Editor for *ACS Macro Letters*. He has served as Chair of the Division of Polymer Physics, APS (1997–8), and as Chair of the Gordon Research Conferences on *Colloidal, Macromolecular and Polyelectrolyte Solutions* (1998) and *Polymer Physics* (2000). Since 2005 he has been Director of the NSF-supported Materials Research Science & Engineering Center at Minnesota. He has authored or co-authored over 440 papers in the field of polymer science, and advised or co-advised over 80 PhD students. His research interests center on the structure and dynamics of polymer liquids, including solutions, melts, blends, and block copolymers, with particular emphases on self-assembling systems using rheological, scattering and microscopy techniques.

ABSTRACT Ionic liquids are an emerging class of solvents with an appealing set of physical attributes. These include negligible vapor pressure, impressive chemical and thermal stability, tunable solvation properties, high ionic conductivity, and wide electrochemical windows. In particular, the non-volatility renders ionic liquids practical components of devices, but they require structure-directing agents to become functional materials. Block polymers provide a convenient platform for achieving desirable nanostructures by self-assembly, with lengthscales varying from a few nanometers up to several hundred nanometers. Furthermore, ionic liquids and polymer blocks can be selected to impart exquisitely tunable thermosensitivity, by exploiting either upper or lower critical solution transitions (UCSTs and LCSTs). In selected cases, it is also possible to prepare photoreversible and photopatternable systems. Overall, by combining designed block polymers and ionic liquids we have demonstrated materials with superior performance for a remarkably diverse set of applications. These include gate dielectrics in organic transistors, electrochromic and electroluminescent gels, and membranes for gas separation, ion batteries, and fuel cells.

Richard **Stein**

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.