

The Chemical and Biological Engineering Department of the
University at Buffalo School of Engineering and Applied Sciences
is Proud to Announce

The 2011 Eli Ruckenstein Lecture



"The Theory of Hydrophobicity: Some Recent Developments on a Venerable Subject"



Pablo G. Debenedetti

Professor of Chemical
and Biological Engineering
Vice Dean of the
School of Engineering and
Applied Science
Princeton University

Tuesday, April 19, 2011
10:45 a.m.

Screening Room
First floor, Center for the Arts
UB Amherst Campus

Reception to follow



About Eli Ruckenstein:

Eli Ruckenstein, SUNY Distinguished Professor, has been on the faculty of the University at Buffalo for nearly forty years. Over this time, his prolific and imaginative research has advanced almost every area of interest to chemical engineering. Ruckenstein spent his formative years behind the Iron Curtain, in Romania, where – with a combination of native intellect, genuine scientific curiosity, and sheer strength of will – he prepared himself for a lifetime of achievement in engineering and science. His work quickly gained international recognition, and he escaped to the West in 1969, joining UB in 1973.

Eli Ruckenstein has received countless honors paying tribute to work across many fields of research. From the American Institute of Chemical Engineers he won the Alpha Chi Sigma Award for his work in transport phenomena, the Walker Award for his work in catalysis, and the Founders Award for his overall contributions to science. From the American Chemical Society he received the Kendall Award for his research in colloids and interfaces, the Langmuir Lecture Award for his contributions to macromolecules, the Schoellkopf Medal for his work in supported metal catalysts, and the Murphree Award in Industrial and Engineering Chemistry. He was given the Humboldt Award by Germany for his work in surfactants, and the Creativity Award by the National Science Foundation for his work in biomolecules. In addition he has been invited numerous times to present named lectures around the world. These contributions and more were further recognized with the National Medal of Science, bestowed in a White House ceremony in 1999. Ruckenstein was elected to the National Academy of Engineering in 1990 and he received the Founders Award from the Academy in 2004. He is a fellow of the American Institute of Chemical Engineers, which, with the occasion of its 100th anniversary, designated him as one of 50 Eminent Chemical Engineers of the Foundation age.

The Ruckenstein Lecture Series

is supported by the Ruckenstein Fund, a new endowment with an ongoing campaign. Funds generated from this endowment will be used to support the Ruckenstein Lecture Series and provide resources to improve teaching and research laboratories in the Department.

Previous Lecturers

2009 Rakesh K. Jain, Harvard Medical School and Massachusetts General Hospital

2010 George Stephanopoulos, Massachusetts Institute of Technology

www.cbe.buffalo.edu

The UB Department of Chemical and Biological Engineering

offers a world-class undergraduate education while pursuing integrative research and graduate training at the frontiers of chemical engineering, in the main areas of nanoscale science and engineering; computational science and engineering; and biochemical and biomedical engineering.

The Department was founded in 1961 and is among the youngest in the Nation. From the start its founders inculcated it with a deep respect for scholarship, and as a consequence the Department quickly grew to the national prominence that it continues to enjoy today. The Department is now undergoing a second phase of growth. Since 2006 faculty size has increased from 13 to 19, and our ranks now include three members of the National Academy of Engineering. Visit: www.cbe.buffalo.edu.

The Theory of Hydrophobicity: Some Recent Developments on a Venerable Subject

Pablo G. Debenedetti

Class of 1950 Professor in Engineering and Applied Science
Professor of Chemical and Biological Engineering
Vice Dean, School of Engineering and Applied Science
Princeton University

Abstract:

The water-mediated tendency of non-polar units to aggregate underlies basic human activities, such as washing, and microscopic natural phenomena, such as protein folding and the formation of biological membranes. Although many aspects of the theory of hydrophobicity are well understood, important questions remain. These include the behavior of water near geometrically and chemically complex protein surfaces; the interplay of kinetics and thermodynamics in controlling surface-induced evaporation, and its possible role in biological self-assembly; and the collapse mechanisms of hydrophobic polymers in water. Recent progress towards an understanding of these problems will be illustrated and placed within the broader context of modern chemical engineering thermodynamics.

About Pablo Debenedetti:

Pablo Debenedetti received his undergraduate education at the University of Buenos Aires, and in 1985 obtained his PhD degree in chemical engineering at the Massachusetts Institute of Technology. Debenedetti's research interests include the thermodynamics and statistical mechanics of liquids and glasses; the structure and thermodynamics of water and aqueous solutions; protein thermodynamics; the theory of nucleation; and metastability. He is the author of one book, *Metastable Liquids*, and more than 200 scientific articles. *Metastable Liquids* was named "best scholarly book in Chemistry" by the Association of American Publishers (1997). Debenedetti's professional honors include the National Science Foundation's Presidential Young Investigator Award (1987), the Camille and Henry Dreyfus Teacher-Scholar Award (1989), a Guggenheim Memorial Foundation Fellowship (1991), the Professional Progress (1997) and Walker (2008) Awards from the American Institute of Chemical Engineers, the John M. Prausnitz Award in Applied Chemical Thermodynamics (2001), the Joel Henry Hildebrand Award in the Theoretical and Experimental Chemistry of Liquids from the American Chemical Society (2008), the Distinguished Teacher Award from Princeton's School of Engineering (2008), and the President's Award for Distinguished Teaching (2008), Princeton's highest distinction for teaching. In 2008 Debenedetti was named one of 100 Chemical Engineers of the Modern Era by the American Institute of Chemical Engineers. He is a member of the National Academy of Engineering and the American Academy of Arts and Sciences, and served as Chair of Princeton's Chemical Engineering Department between 1996 and 2004.



UB School of Engineering and Applied Sciences
University at Buffalo *The State University of New York*

Department of Chemical and Biological Engineering
303 Furnas Hall
University at Buffalo
The State University of New York
Buffalo, NY 14260-4200

NONPROFIT ORG
U.S. POSTAGE PAID
BUFFALO NY
PERMIT NO. 311