

EECE Department Seminar

AEESP Distinguished Lecture

Friday, April 21, 2017, 11:00am

Brauer Hall, Room 12

High-Performance Membranes for Energy-Efficient Desalination and Wastewater Reuse

ABSTRACT

Water scarcity is one of the greatest global crises of our time. Increasing water supply beyond what is obtainable from the hydrological cycle can be achieved by seawater desalination and wastewater reuse. Highly effective, low-cost, robust technologies for desalination and wastewater reuse are needed, with minimal impact on the environment. Recent advances in the science and technology of desalination and wastewater reuse will be presented, focusing on membrane-based processes. Major devel-

opments in these technologies are possible due to recent advances in materials science, nanotechnology, and the fundamental understanding of the solid-water interface. In this presentation, we will show how we can exploit novel nanomaterial and polymer architectures to develop better approaches to design and fabricate membranes. By integrating the facile processability, light-weight, and low-cost features of organic polymers with functionality provided by inorganic nanostructures, we can develop a new membrane materials platform with applica-

tions in desalination and wastewater reuse. Among the examples that will be discussed in this presentation are the development of antifouling membranes, biofouling-resistant membranes, and next-generation membranes that overcome inherent limitations of existing technologies.

Menachem (Meny) Elimelech, Professor

Department of Chemical & Environmental Engineering, Yale University

Menachem (Meny) Elimelech is the Roberto Goizueta Professor at the Department of Chemical and Environmental Engineering at Yale University. His research is in the general area of the water-energy nexus, including (i) membrane separations for desalination and wastewater reuse, (ii) environmental applications of nanomaterials, and (iii) water and sanitation in developing countries. Professor Elimelech has

received numerous awards in recognition of his research. Notable among these are his election to the National Academy of Engineering in 2006, the Eni Prize for 'Protection of the Environment' in 2015, and the Clarke Prize for excellence in water research in 2005. He has also been recognized as a Thomson Reuters Highly Cited Researcher in two categories: Environment/Ecology and Chemistry. Professor Elimelech has advised 35 Ph.D.

students and 24 postdoctoral researchers, many of whom hold leading positions in academia, government, and industry. In recognition of his teaching and mentoring excellence, he received the W.M. Keck Foundation Engineering Teaching Excellence Award in 1994, the Yale University Graduate Mentoring Award in 2004, and the Yale University Postdoctoral Mentoring Prize in 2012.

