DEPARTMENTAL SEMINAR

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TOPIC	*Membrane Fouling: Mechanisms and Mitigation Strategies*
SPEAKER	**Dr. Mi Baoxia** **George Washington University, USA**
HOST	**Professor Chung Tai-Shung, Neal**
DATE	**16 August 2011 (Tuesday)**
TIME	**2:00 PM**
VENUE	**Block E5, 2nd Level, Room; 32 (E5-02-32)** **Interactive Map of NUS**
SYNOPSIS	Due to its superior efficiency in removing a wide range of contaminants, membrane technology has been increasingly used in many water separation applications such as drinking water purification, wastewater reclamation, and desalination. However, the long-standing problem of membrane fouling severely deteriorates membrane performance by causing flux decline and worsening effluent quality. Subsequently, the frequent use of chemical agents to cleanse fouled membranes inevitably shortens membrane life, increases operating costs, and releases chemical wastes into the environment. Therefore, enhancing energy efficiency and developing better fouling-mitigation strategies becomes an essential task for the membrane community to ensure water, energy, and environmental sustainability. In this talk, I will discuss our ongoing research efforts to advance membrane technology. Currently we are trying to gain a better understanding of membrane fouling mechanisms and reduce membrane fouling through surface modification. To systematically design highly fouling-resistant membranes, we have proposed an integrated experiment-simulation approach to decipher membrane-foulant interactions at the nanoscale. Also, I will highlight an emerging “green” membrane process, forward osmosis (FO), which exploits natural osmotic pressure instead of hydraulic pressure for water separation, thereby potentially cutting down energy consumption. Our study reveals that (i) FO membrane process has low fouling potential compared to pressure-driven membrane

	processes, and (ii) depending on specific membrane materials used, water flux can even be fully recovered by simple physical cleaning.
BIOGRAPHY 	Dr. Baoxia Mi is an assistant professor of environmental engineering at The George Washington University. Prior to this position, she was a postdoctoral researcher at Yale University for two years. She holds a B.S. and an M.S. from Tianjin University in China and a Ph.D. from University of Illinois at Urbana-Champaign, all in environmental engineering. Research and educational activities in her Green Membrane Lab are focused on physicochemical and biological processes with an emphasis on environmental nanotechnology and membrane technology for water sustainability.
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