

Tuesday, April 9, 2013

Please join

Matthew Tirrell

Founding Pritzker Director of the Institute for Molecular Engineering

for his lecture

Molecular Engineering
A New Approach to Engineering Research and Education

The Casino 195 East Delaware Place Chicago, Illinois

Lunch at 11:30 a.m.

Followed by Mr. Tirrell's lecture at 12:00 Noon The Cost is \$45 per person, members and guests Please respond by Tuesday, April 2, 2013

See back page for parking information

Matthew Tirrell

Matthew Tirrell studies micelles, collections of lipid molecules that form spontaneously in water. The founding Pritzker Director of the Institute for Molecular Engineering, Mr. Tirrell has developed a type of micelle that, when injected into mice, migrates to the location of artery-hardening plaque. Using that homing capability, he says, scientists could tailor micelles for diagnostic or therapeutic uses—dissolving blood clots, for example, or delivering medication to treat a tumor. Designing structures to achieve such ends involves a process called molecular self-assembly. "When you put things together in a beaker, they don't chemically react," Mr. Tirrell says, "but they spontaneously organize into structures that are useful."

Mr. Tirrell received his Bachelor's degree in Chemical Engineering from Northwestern University in 1973 and a Ph.D. in Polymer Science and Engineering from the University of Massachusetts in 1977. He comes to the University of Chicago from the University of California, Berkeley, where he served since 2009 as professor and chair of the department of Bioengineering and professor of materials science and engineering and chemical engineering. Prior to his appointment at Berkeley, Mr. Tirrell served for a decade as dean of engineering at UC Santa Barbara where he helped build the program to national prominence.

A chemical engineer by training, Mr. Tirrell spent 22 years at the University of Minnesota, where his work included adhesion, friction, and lubrication for 3M, studying the surface properties of polymers. "About ten or 15 years ago, my interest within that domain shifted more toward biological interaction," he says. "If you put a synthetic material"—such as an implantable medical device—"into a physiological environment, how does it interact with the physiological environment?" That question led him to the micelles he studies now.

In Mr. Tirrell's vision for the institute, scientists will likewise follow their interests wherever they lead. Molecular engineers doing biological research, for example, will not focus on health care to the exclusion of other potential uses for their work. The variety of applications for molecular-level research all but demands such wide-angle vision. Chicago chemistry postdoc Dimitris Priftis, another former Berkeley colleague of Mr. Tirrell's, studies polyelectrolyte particles that can be used in cosmetics, food products, and also to make the display for the Amazon Kindle. "I want people that are broad and versatile enough to think about applications not only in health care but energy, environment, maybe even in computing: how does biology transform information? Stuff like that," Mr. Tirrell says. "That's going to mean that we're going to have people skilled in biology working with people skilled in electrical engineering—unusual combinations."

Molecular Engineering A New Approach to Engineering Research and Education

The University of Chicago has launched a powerful approach to engineering research and education with the establishment of the Institute for Molecular Engineering (IME). The Institute, created in partnership with Argonne National Laboratory, is building a faculty to translate molecular science into technology, engineering systems from the molecular-level up. In founding an engineering program, the University brings together existing strengths in the biological and physical sciences. IME will also collaborate with Chicago Booth to create a venture engine to develop cuttingedge initiatives in energy, healthcare, information technology, sustainability, and more. The implications for the city's economy are profound.

Building an engineering faculty in the midst of a great university known not only for science but also for humanities and social sciences brings great competitive advantages. In the words of the late Steve Jobs, describing Apple products, "... technology alone is not enough—it's technology married with liberal arts, married with the humanities, that yields us the result that makes our heart sing..." Design, new inventions, insights and leaps of imagination about the direction of technology evolution are nurtured by a broader education.

The University of Chicago is leading the way in this implementation of convergence of disciplines via IME, countering decades of artificial separation of engineering departments in academia. Institute researchers likely will pursue a variety of research that might include the development of smart materials or biologically inspired materials. A bridge built of smart materials might, for example, be able to signal when it has become dangerously stressed, or possibly even to repair itself. Biologically inspired materials, meanwhile, might consist of molecular components that could build muscle and tissue to heal severe injuries. Molecular engineers may also be able to devise faster computers that harness light rather than electrons to perform their operations. Researchers foresee applications of molecular engineering in clinical medicine, such as in the study of complex systems of cell signaling. At IME scientists and engineers will form the IME faculty with a common goal of bringing engineering solutions to society.

STEERING COMMITEE

Alice Young Sabl, Chair

Barbara S. Adelman Heather Black Christina Chatalas Gay-Young Cho Michelle Collins Constance B. Coolidge Margery Kamin Feitler Geri Sands Hansen Ronne Hartfield Katie Hazelwood

Margie Janus
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Beth Sonnenschein
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Elizabeth Thompson
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The Casino is one block east of Michigan Avenue on the southwest corner of East Delaware Place and North Mies van der Rohe Way. Delaware runs one way eastbound

PARKING: Attendant Parking is available at GO Parking Garage, 200 East Delaware—enter on Delaware (\$13 for 1-2 hours, \$20 for 3-5 hours), or self-parking at the Hilton Suites, 198 East Delaware—enter on Walton (\$24 for 1-2 hours, \$32 for 2-6 hours). Several other garages and lors are available in the area.

Persons with a disability, who believe they may need assistance, please contact Abigail Coyne at 773/702-9322.

Visit the Women's Board website at womensboard.uchicago.edu



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Member Name

Guest Name(s)	
Enclosed is my check for \$	(\$45 per person)

payable to the Women's Board



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