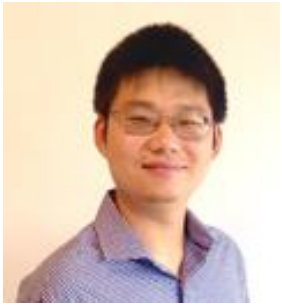
NANYANG TECHNOLOGICAL UNIVERSITY

School of Materials Science and Engineering



Seminar Topic:

Beyond Equilibrium Properties of Soft Interfaces

by Assistant Professor Yu Jing

Abstract

Soft interfaces such as polymer surfaces and cell membrane are often not at thermodynamic equilibrium. Their properties are governed by dynamic (time- and rate-dependent), non-equilibrium interactions that occur during for example, manufacturing processes, but much of our understanding on such systems is based on at-equilibrium concepts. The successful development and technological realization of next-generation functional soft surfaces will likely depend upon transitioning from equilibrium materials to materials with multidimensional, hierarchical structures and beyond-equilibrium properties. Such a transition will require understanding of and control over materials interactions at the nanoscale. In this talk, I will show how to design and control the structure and functionality of surface tethered polyelectrolyte brushes via tuning the interactions between the polyelectrolytes. I will further demonstrate the effort in developing gecko-mimetic adhesives for robotic applications using micro-textured polymer surfaces. By combining my expertise in intermolecular interactions, bio- and surface chemistry as well as scattering techniques, I plan to establish an extensively collaborative and interdisciplinary research program centered on the non-equilibrium properties of functional soft interfaces.

About the Speaker

Dr. Jing Yu is an assistant professor in the School of Materials Science and Engineering (MSE) at Nanyang Technological University (NTU) in Singapore. He graduated from the University of California, Santa Barbara with a PhD in Chemical Engineering (2012). His PhD research focused on the nanomechanics of biomaterials and biomimetics. He conducted experimental and theoretical studies on both mussel and gecko adhesive systems, and developed bio-inspired polymer surfaces and nano-structured materials. Following his PhD, Dr. Yu did a postdoc with Prof. James Heath at California Institute of Technology, where he worked on engineered T cell immunotherapy. In 2014, Dr. Yu expanded his research interests towards polyelectrolytes brushes during his postdoc with Prof. Matthew Tirrell at the University of Chicago.

The overall goal of Dr. Jing Yu's research is to characterize the dynamic properties of interfaces with hierarchical structures, and to gain molecular-level control of soft interfaces to enable design of integrated, multifunctional interfaces. His work has appeared in various top journals, including Nature Chemical Biology, PNAS, JACS, Advanced Materials, Advanced Functional Materials, and Macromolecules.

Wednesday, 1 November 2017 Time: 2:00 pm to 3:00 pm
Venue: MSE Meeting Room 1 (N4.1-01-28)
Hosted by: Assistant Professor Dalton Tay Chor Yong

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