The Edward Noble Kramer Lectureship in Physical Chemistry

Thursday, September 11, 2014 | **4:00 pm** | **Room 1610 Engineering Hall**

Combining Chemistry, Engineering and Biology to develop novel antifouling materials

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Creating a robust synthetic material with antifouling properties would have broad technological implications for areas ranging from biomedical devices to fuel transport to architecture but has proven to be extremely challenging. Inspirations from natural nonwetting structures, particularly the lotus, surged the development of liquid-repellent microtextured surfaces that rely on the formation of a stable air-liquid interface. Despite over a decade of intense research, these surfaces are, however, still plagued with problems that restrict their practical applications: they show limited oleophobicity with high contact angle hysteresis; fail under pressure and upon any physical damage; cannot self-heal, and are expensive to produce. To address these challenges, we introduced a new strategy to create self-healing, **Slippery Lubricant-Infused Porous Surfaces (SLIPS)** that outperform state-of-the-art synthetic surfaces in their ability to resist ice and microbial adhesion and repel various simple and complex liquids. By coordinating surface nanostructuring, chemical functionalization and lubricant properties, one can design stable, shear-tolerant liquid-repellent coatings and manufacture them on arbitrary materials and complex shapes. We anticipate that the slippery surfaces can find important applications in fluid handling and transportation, optical sensing, medicine, and as antifouling surfaces against highly contaminating media operating in extreme environments.

Please join us at 3:30 pm for a reception in the Engineering Hall Lobby prior to the lecture