

# North Carolina Section of the American Chemical Society ACS Polymer Discussion Group



**Thursday March 5, 2009**

University Club: North Carolina State University

\*Social Hour: 5:30 PM

\*\*Dinner: 6:00 PM

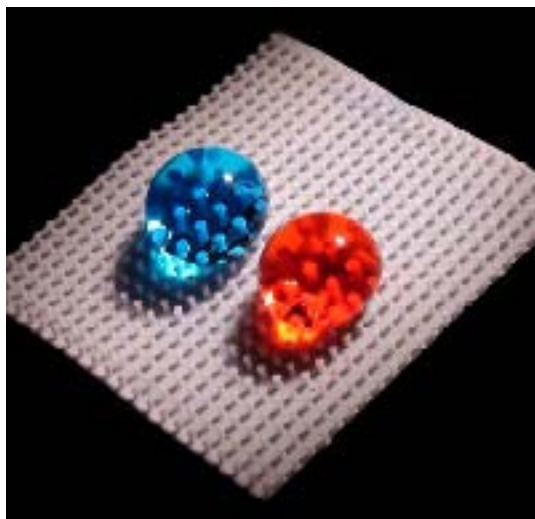
Program: 7:00 PM

## **Designing Robust Omniphobic Surfaces**

**Robert E. Cohen**

**St. Laurent Professor of Chemical Engineering  
Massachusetts Institute of Technology**

Superhydrophobic surfaces that display water contact angles greater than 150° with low contact angle hysteresis are becoming commonplace in the materials community. Microscopic pockets of air trapped beneath the high surface tension ( $\gamma_{lv} = 72\text{mN/m}$ ) water droplets lead to a composite solid-liquid-air interface in thermodynamic equilibrium. Previous experimental and theoretical work suggests that it should not be possible to form similar fully-equilibrated composite interfaces with drops of low surface tension liquids such as alcohols or alkanes (e.g. pentane:  $\gamma_{lv} = 16\text{ mN/m}$ ). In this lecture I will discuss novel surfaces that possess the required re-entrant topographical texture and surface chemistry to support strongly metastable composite solid-liquid-air interfaces for any liquid. Quantitative design parameters will be introduced to guide the development of these novel omniphobic surfaces. Examples that have been realized to date will be demonstrated: these embodiments include lithographically fabricated microhoooods in silicon, randomly deposited electrospun fiber mats and dip-coated textiles.



- \* Social hour will consist of a cash bar.
- \*\* Contact Russell Gorga at [regorga@ncsu.edu](mailto:regorga@ncsu.edu) for dinner reservations by noon on Tuesday March 3, 2009, to guarantee a reservation for dinner. If you are unable to make a reservation by that time, check with Russell regarding the availability of places. Dinner is \$15 for Members and \$8 for students. Reservations are *not* required to attend the seminar without dinner.