

# Nanoscale Simulation and Modeling

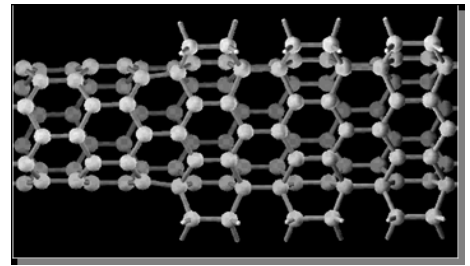
MW 11:45am-1:00pm, Room 313 MRC  
Centennial Campus

Instructors: Dr. D. Brenner & Dr. Y. Yingling

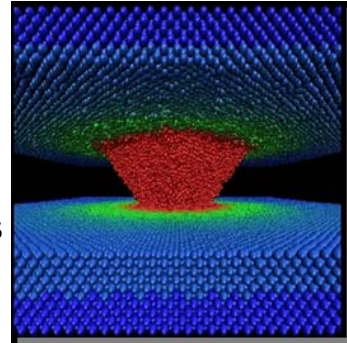
The course is designed to assist engineering students in learning principles of atomic and multi-scale modeling as applied in nanometer-scale science and technology.

**In this course** a wide array of nanometer-scale simulation and modeling methods - ranging from fundamental quantum mechanics to molecular and multi-scale modeling - will be presented, along with numerous examples of where these methods have contributed to advances in nano-science and technology.

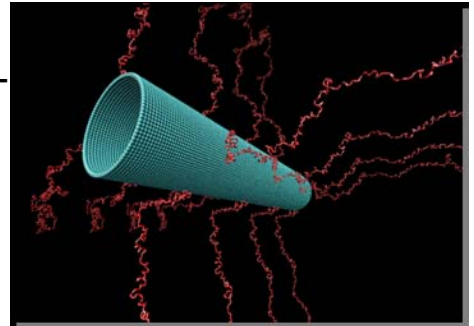
**Upon completing this course**, students will be able to understand, explain, and discuss scientific papers in nano-science and technology, and effectively apply simulation methods in their future research.



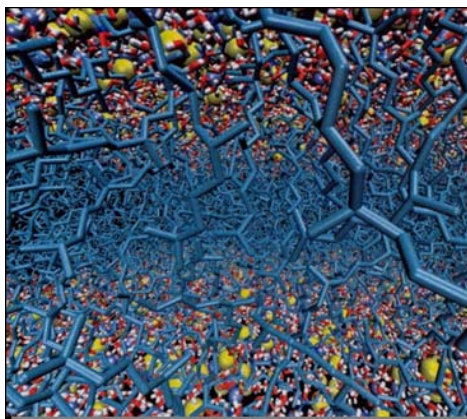
Schottky junction created by functionalizing a carbon nanotube.



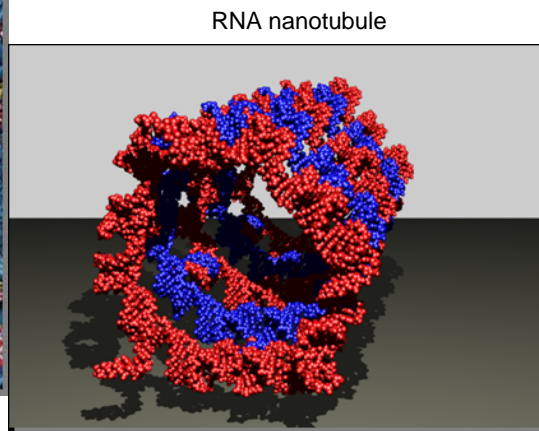
Simulated Joule heating of a nanometer-scale metal contact.



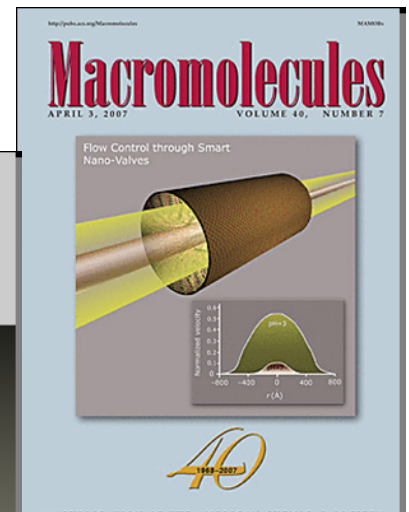
Model of a bio-mimetic neurofilament.



Molecular simulation of lipid bi-layer membrane



RNA nanotubule



Simulated nano-scale flow control

**Course Prerequisites:** Previous knowledge of simulations is not required. This course is appropriate for advanced undergrads and graduate students in materials science, engineering, chemistry, physics and the biomedical fields.