DR. DARRELL VELEGOL

PROFESSOR

DEPARTMENT OF CHEMICAL ENGINEERING

THE PENNSYLVANIA STATE UNIVERSITY

UNIVERSITY PARK, PENNSYLVANIA

Will present a seminar on

“TRANSPORT AND CONTROL OF CATALYTIC AND MINERAL-DRIVEN MICROMOTORS”

Catalytic motors are micron-sized particles, often consisting of metals such as platinum, gold, or silver. They can also be made of various minerals, such as calcium carbonate. The motors have the ability to consume chemical energy and move autonomously, often at >10 micrometers/sec. Not only can the motors self-move individually, but collections of the motors often give an emergent directed motion, much like bacterial populations that engage in chemotaxis or phototaxis movement. In this talk I will describe simple techniques for fabricating the motors or using existing minerals, examine the auto-electrokinetic mechanisms by which the motors move individually, and analyze how the motors communicate with each other and the system to achieve collective movement. Then we will explore several key challenges and opportunities with catalytic motors: How do we fabricate custom motors? How do we design and control their individual and collective transport? What is required for scaling up production of the motors? And might the auto-electrokinetic transport mechanism have important applications?

THURSDAY, SEPTEMBER 22, 2011

COOKIES AND COFFEE -- 2:45 P.M.

SEMINAR -- 3:00 P.M.

SARKEYS ENERGY CENTER, ROOM M-204

THIS IS A REQUIRED SEMINAR FOR CHE 5971

Accommodations on the basis of disability are available by contacting the office before the event.