ΕΘΝΙΚΟ ΜΕΤΣΟΒΙΟ ΠΟΛΥΤΕΧΝΕΙΟ
ΣΧΟΛΗ ΧΗΜΙΚΩΝ ΜΗΧΑΝΙΚΩΝ

ΕΠΙΤΡΟΠΗ ΣΕΜΙΝΑΡΙΩΝ, Καθηγητής Α. Κοκόσης

Ηρώων Πολυτεχνείου 9, Πολυτεχνειούπολη Ζωγράφου, Αθήνα 15780
Πληροφορίες: **Α. Μουντράκη,** Τηλ.:210 772 3129, Fax: 210 772 3228,
E-mail: mountrak@central.ntua.gr

ΣΕΜΙΝΑΡΙΟ ΧΗΜΙΚΗΣ ΜΗΧΑΝΙΚΗΣ

Παρασκευή 22 Οκτωβρίου 2010, 13:00

Αίθουσα Σεμιναρίων «Ν. Κουμούτσου»

Professor **Paschalis Alexandridis**
Department of Chemical and Biological Engineering
University at Buffalo - The State University of New York (SUNY)

Self-Assembly of Amphiphilic Block Copolymers: Fundamentals and Applications

Block copolymers offer prime examples of self-assembling systems that are being explored for diverse applications, ranging from drug delivery carriers to polymer electrolytes for lithium batteries. In the "dry" state, block copolymers can attain intramolecular organization via crystallization or hydrogen bonding, and supramolecular organization via segregation of the different blocks. The addition of selective solvents may disrupt certain types of organization but can promote others. For example, block copolymers of fixed chemical composition can self-assemble in the presence of selective solvents to form a variety of thermodynamically stable phases with structures that include ordered arrays of nanometer-scale spherical, cylindrical or planar assemblies. The solvents provide valuable degrees of freedom for controlling the morphology and, hence, structure/property relationships. The solvents can also affect dramatically molecular/ionic mobility, and the dynamics of structural transitions.

The presentation will utilize findings from our research to highlight the interplay between fundamentals of amphiphilic block copolymer (ABC) self-assembly in selective solvents and ABC applications in (a) the structuring of waterborne complex fluids with properties tailored for pharmaceutics, and (b) the environmentally benign synthesis of nanoparticles (NP) in a size- and shape-controlled manner. ABCs can provide nanoscale environments of varying and tunable shape, dimensions, mobility, local polarity, concentration, and reactivity. ABCs can thus initiate NP formation, facilitate NP growth, and control NP size and shape. ABCs can be further useful in surface-modifying NPs for dispersibility, and in promoting long-range NP organization.

http://www.cbe.buffalo.edu/alexandridis