ΠΑΝΕΠΙΣΤΗΜΙΟ ΚΡΗΤΗΣ **UNIVERSITY OF CRETE**

ΤΜΗΜΑ ΕΠΙΣΤΗΜΗΣ ΚΑΙ ΤΕΧΝΟΛΟΓΙΑΣ ΥΛΙΚΩΝ

DEPARTMENT OF MATERIALS SCIENCE AND TECHNOLOGY

ΠΡΟΣ
1) Όλα τα μέλη ΔΕΠ του Τμήματος Επιστήμης και Τεχνολογίας Υλικών
2) Τους εκπροσώπους των Μεταπτυχιακών φοιτητών του Τ.Ε.ΤΥ
3) Την Επταμελή Εξεταστική Επιτροπή
4) Όλα τα μέλη της Πανεπιστημιακής Κοινότητας

Πρόσκληση σε Δημόσια Παρουσίαση της Διδακτορικής Διατριβής του

κ. Παμβουξόγλου Ανδρέα

(Σύμφωνα με το άρθρο 12 του Ν. 2083/92)

Την Πέμπτη 20 Φεβρουαρίου 2014 και ώρα 10:00 στην αίθουσα Σεμιναρίων 3ου ορόφου Τμήματος Φυσικής

θα γίνει η δημόσια παρουσίαση και υποστήριξη της Διδακτορικής Διατριβής του υποψήφιου διδάκτορα του Τμήματος Επιστήμης και Τεχνολογίας Υλικών κ. **Παμβουξόγλου Ανδρέα** με θέμα:

«DYNAMICS AND KINETICS IN SOFT MATTER SYSTEMS: EFFECT OF LIGHT AND SHEAR IN CONCENTRATED POLYDIENE SOLUTIONS AND COLLOIDAL SUSPENSIONS»

ABSTRACT

This thesis is concerned with the study of two projects related with mechanical and optical forces in soft matter systems. In the first part, the effect of light irradiation in polydiene solutions was examined. Specifically the characterization of the light-induced fibers and the effect of light in more complicated polydiene-based systems were studied. We show that upon irradiation radicals are formed, which crosslink the material, creating fibers. We also revealed that by changing the sample's parameter (temperature, solvent and microstructure) we affect the kinetics of pattern formation. More

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specifically multiblock (diblock, triblock) copolymers in selective solvents, open new routes to patterning due to rich phase diagram.

In the second part, we report on the structure and dynamics in suspensions of soft colloidal core-shell particles up to the glass regime. Particles with different chain molecular weight grafted on a hard core were used to investigate the effect of softness. In the liquid regime due to the high refractive index mismatch between particle-solvent, we used 3D Dynamic Light Scattering. We demonstrate that the dynamics of the system can be interpreted with permeable spherical particles model, varying only one parameter, the hydrodynamic penetration depth x. In the glass regime the system is strongly non-ergodic and ages with time. Using Multispeckle Dynamic Light scattering (MSDLS) we found a glass-crystal re-entrant transition, independent of particle's softness. The effect of softness upon shear was also investigated through rheology. A series of linear (dynamic frequency sweep), nonlinear (dynamic strain sweep, LAOS, flow curves) and transient (start-up) experiments were performed, demonstrating clearly the effect of softness.