ΠΑΝΕΠΙΣΤΗΜΙΟ ΚΡΗΤΗΣ
ΤΜΗΜΑ ΕΠΙΣΤΗΜΗΣ ΚΑΙ ΤΕΧΝΟΛΟΓΙΑΣ ΥΛΙΚΩΝ

ΠΑΡΟΥΣΙΑΣΗ ΔΙΠΛΩΜΑΤΟΣ ΜΕΤΑΠΤΥΧΙΑΚΩΝ ΣΠΟΥΔΩΝ

Τίτλος

«Dynamics and mechanical reinforcement in gels of synthetic and biological origin»

«Δυναμική και μηχανική ενίσχυση πηκτωμάτων συνθετικής και βιολογικής προέλευσης»

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Επιβλέπων καθηγητής: Δημήτριος Βλασσόπουλος

Δευτέρα 12/10/2020

10:00

Η παρουσίαση θα πραγματοποιηθεί στην αίθουσα Η/Υ Ε109 στο κτήριο του τμήματος Μαθηματικών και Εφαρμοσμένων Μαθηματικών και θα είναι διαθέσιμη στο κοινό μέσω τηλεδιάσκεψης σύμφωνα με το άρθρο τρίτο, παρ. 1 της με αριθμ. 115744/Ζ1/4.9.2020 Κοινής Υπουργικής Απόφασης (Β΄3707), στον παρακάτω σύνδεσμο:

https://teleconf.materials.uoc.gr/b/sta-tz6-zic-zuh

ABSTRACT

We investigate the dynamic and viscoelastic properties of associating polymers forming gels. Our study addresses two challanges, the detailed characterization of the associating moeities, and the undertanding of the properties of the formed networks, especially in the context of mixtures where mechanical reinforcement represents the main target. The achieve our goals, and in view of

potential applications, we use both synthetic and biological macromolecules. First, we examine the self-assembly mechanism of telechelic star polymers comprising diblock copolymers in selective solvents. They can be thought of as building blocks of responsive supramolecular materials. We study the effect of key parameters like they functionality (f) and fraction of the associating (solvophobic) groups on their self-organization mechanism and dynamics in dilute solution. Next, we focus on improving the mechanical properties a mucus hydrogel formed by the mucin proteins derived from hagfish mucin vesicles by adding nanofillers or even a second network. We test different fillers and identify the consequences of interactions between the mucin matrix and fillers by means of linear and nonlinear shear and capillary break-up extensional rheological measurements. Hence, we manage to establish protocols for reinforcement. Our findings offer insights for linking the properties of these gels to their structure and for designing such soft composites with tunable rheological and mechanical properties.