Πρόσκληση σε Δημόσια Παρουσίαση της Διδακτορικής Διατριβής της

κ. Consiglia Carillo

(Σύμφωνα με το άρθρο 41 του Ν. 4485/2017)

Την **Πέμπτη 05 Μαΐου 2022** και ώρα **12:00** στην **αίθουσα Τηλε-εκπαίδευσης Ε130,** στο κτήριο του **Τμήματος Μαθηματικών και Εφαρμοσμένων Μαθηματικών** του Πανεπιστημίου Κρήτης, θα γίνει η δημόσια παρουσίαση και υποστήριξη της Διδακτορικής Διατριβής της υποψήφιας διδάκτορος του Τμήματος Επιστήμης και Τεχνολογίας Υλικών κ. Consiglia Carillo με θέμα:

« Ρεολογία Πολυμερικών Δικτύων με Διπλή Δυναμική »
« Rheology of Polymeric Networks with Double Dynamics »

Abstract

Double polymeric networks represent an emerging class of responsive materials combining different viscoelastic properties (due to topological constraints, reversible and/or permanent crosslinkers) to achieve versatile performance. Knowledge of their rheology and its link to the structure are essential for the use of double dynamics networks (DDNs) in ubiquitous applications. Therefore, it is desired to obtain a deep understanding of DDN dynamics in both the linear and nonlinear regimes of deformation, to characterize their multi-scale responses. In this thesis, rigorous experimental studies of the linear and nonlinear rheology of two classes of DDNs are presented. They involve (i) a well-characterized model system inspired by interpenetrated networks and comprising a mixture of telechelic star polymers and entangled linear chains, and (ii) an industrial double network with both permanent and reversible crosslinkers. Complementary SAXS measurements and tube-based modeling were also used in conjunction with rheometry to identify the role of various molecular parameters such as the lifetime and density of crosslinkers, topological constraints, molar mass polydispersity, and external stimuli like temperature and concentration, on the viscoelastic response of the networks. The systematic investigation performed yielded generic observations and guidelines to tailor the rheological behavior of the multi-responsive networks. To understand the conformational changes under application of a strong shear field, a protocol

was developed using an entangled polystyrene network as paradigm. Ex situ small-angle neutron scattering measurements were performed on appropriately quenched samples at different accumulated strain and shear flow rates. The results contribute to the understanding of the link between rheological properties and molecular deformation of linear chains and may serve as a guideline for tuning the rheological response of polymeric networks.