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. Salvatore Costanzo

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

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θα γίνει η δημόσια παρουσίαση και υποστήριξη της Διδακτορικής Διατριβής του υποψήφιου διδάκτορα του Τμήματος Επιστήμης και Τεχνολογίας Υλικών

κ. Salvatore Costanzo με θέμα:

«Development of Protocols for Investigating Linear, Branched and Supramolecular Polymers Undergoing Shear»

ABSTRACT

The aim of the present thesis is to shed light into the nonlinear rheological behavior of complex polymeric structures by means of state-of-the-art instrumentation, particularly focusing on shear rheology. Strong nonlinear flows are ubiquitous in polymer processing, therefore their understanding is fundamental for technological applications. On the other hand, the progress in nonlinear rheology has been halted by experimental issues associated with flow instabilities, rendering rheometric experiments problematic. The development of experimental tools to resolve these issues is a timely, outstanding challenge. Overcoming flow instabilities in nonlinear experimental rheology will advance the field in different directions such as accurate modeling development, decoding molecular mechanisms of motion, designing macromolecular systems with desired, tunable properties. Particularly, in relation to molecular mechanisms, knowledge of polymer dynamics in nonlinear flows is rather limited, especially in shear. In such a context, this thesis work attempts to answer two key questions: i) How can we obtain reliable measurements in transient shear? ii) What is the interplay of entanglements, branching and associations in determining the nonlinear rheology of complex systems? It is clear that answering the first question is necessary in order to address the second one. Therefore, in the first part of this thesis we present the design and implementation of a cone-partitioned-plate (CPP) geometry for ARES rheometer that allows for accurate, artifact-free measurements in nonlinear transient shear. In the second part, we apply CPP and uniaxial extensional rheometry to investigate model systems including linear, ring, caley-tree and dendronized polymers, in order to address the above-mentioned questions.