

ΠΑΡΟΥΣΙΑΣΗ ΔΙΠΛΩΜΑΤΟΣ ΜΕΤΑΠΤΥΧΙΑΚΩΝ ΣΠΟΥΔΩΝ

## Τίτλος

**«High-pressure light scattering and microrheology: application to supramolecular and associating polymer solutions»**

**«Σκέδαση φωτός και μικρορεολογία σε υψηλή πίεση: εφαρμογή σε υπερμοριακά και συσσωματούμενα πολυμερικά διαλύματα»**

του Νικολάου Αθανασίου Μπούρκερ μεταπτυχιακού φοιτητή του

Τμήματος Επιστήμης και Τεχνολογίας Υλικών του Πανεπιστημίου Κρήτης

Επιβλέπων καθηγητής: Δημήτριος Βλασσόπουλος

Πέμπτη 03/09/2020

10:00

<https://teleconf.materials.uoc.gr/b/sta-nku-odv>

Η παρουσίαση θα διεξαχθεί με τηλεδιάσκεψη στον παραπάνω σύνδεσμο, σύμφωνα με α) την παρ. 1 του άρθρ.12 της από 11.3.2020 Πράξης Νομοθετικού Περιεχομένου (Α'55), και τις οδηγίες εφαρμογής Α Δ1α/Γποικ.28237/5.5.2020 Κ.Υ.Α (Β'1699), ΑΔΑ: ΨΠ7046ΜΤΛΗ-43Φ.

### Περίληψη:

We present a methodology to systematically investigate the dynamics and the linear viscoelastic properties of soft materials at elevated pressures (kbar). It is based on a stainless steel chamber coupled with a dynamic light scattering (DLS) setup, where the pressure is introduced either by means on an inert gas or hydraulically with a piston. Depending on the system studied and contrast requirements, DLS is performed either in the single scattering or the diffusive wave limits.

The rheological information is obtained by means of passive microrheology, hence the linear viscoelastic spectrum of a diverse range samples, from solutions and gels to melts, can be obtained over a wide range of frequencies, as also shown recently. We apply this approach to the study of the dynamic phase behavior and microrheology of (i) a living polymer based on hydrogen bonding in different a-polar solvents, exhibiting different supramolecular structures, and (ii) a telechelic star polymer in selective solvent forming gels of patchy soft colloids. We highlight the effects of pressure on the self-organization and structural transitions, as well as its consequences on the dynamics, as revealed by the changing diffusion coefficients and frequency-dependent moduli.