

# Plasmonic microcapsules for strain detection

Rémi Dreyfus

CNRS-Université de Sherbrooke, Sherbrooke, Quebec J1K 0A5, Canada

remi.dreyfus@cnrs.fr

**Keywords :** *nanoparticles, strain detection, plasmonics, self-assembly*

In this presentation, I will introduce a new type of colloidal plasmonic colorimetric sensors that allow the detection of strains in polymer films. The colloidal sensors are prepared by self-assembly of gold nanoparticles that stabilize a Pickering emulsion. The surface of the emulsion is solidified, enclosing the nanoparticles in a shell, forming colloidal capsules [1,2]. The capsules are then embedded in an elastomeric matrix and deformed under uniaxial stress. This deformation causes a change in the plasmonic response of the capsules, allowing the detection of deformations at the capsule scale. This study provides a robust and easily adaptable method to produce sensors that can potentially detect the presence of chemicals or small deformations at the micro- and nanoscale.

[1] Burel et al. Plasmonic Elastic Capsules as Colorimetric Reversible pH-Microsensors. *Small*, 13 (2017)

[2] Burel et al. Plasmonic-Based Mechanochromic Reversible pH-Microsensors. *Small*, 16, e1903897 (2020)