

3rd International Conference on Computations for Science and Engineering

20-23 September 2023, Naples, Italy

THEMATIC SYMPOSIUM: MICRO AND NANO-MECHANICS OF SMART MATERIALS AND ADVANCED STRUCTURES

chaired by Francesco Fabbrocino⁽¹⁾, Paolo Lonetti⁽²⁾ and Luca Lanzoni⁽³⁾

⁽¹⁾: Department of Engineering, University Telematic Pegaso

⁽²⁾: Department of Civil Engineering - University of Calabria

⁽³⁾: DIEF: Department of Engineering “Enzo Ferrari”, University of Modena and Reggio Emilia

The Symposium entitled “MICRO AND NANO-MECHANICS OF SMART MATERIALS AND ADVANCED STRUCTURES” is organised by the Research Group NGOP “Opportunities and challenges of nanotechnology in advanced and green construction materials” in the framework of PRIN2020 project (Prot. 2020EBLPLS), and it is included in the 3rd International Conference on Computations for Science and Engineering, to be held in Naples (& ON-LINE), 20-23 September 2023 (<https://events.unibo.it/iccse>). This Symposium will be chaired by *Francesco Fabbrocino, Paolo Lonetti and Luca Lanzoni*.

Keywords: nonlocal elasticity; failure analysis; dynamics of nanostructures; homogenization techniques; smart nanocomposites; multiscale analyses.

Main topics

Nowadays smart materials and micro- and nano structures are currently used in many areas of technology (e.g. civil, mechanical, and aerospace engineering, mechanics of MEMS and NEMS, biomechanics, etc.) to obtain composites systems and/or engineered materials exhibiting optimised physical performances.

On the other hand, it is known that classical local continuum mechanics fails to predict the behaviour of such a class of micro (or nano) structures as the internal length scale significantly affects their mechanical response under both static and dynamic loadings. Furthermore, large deformations and displacements often take place, thus requiring accurate fully nonlinear modelling.

The present symposium aims at spreading original results included in the broad range of issues ranging from (but not limited to) the mechanics of nanobeams, nanoplates, composites, elastic media including micro- or nano inclusions, materials reinforced with cylindrical micro and/or nanofibers, non-local effects in both conventional and advanced materials, multiscale

analyses, and homogenization schemes. Crack formation and growth, delamination and, more in general, damage phenomena in micro- or nano structures handled by theoretical analyses as well as numerical approaches are also covered by the symposium. Multidisciplinary studies encompassing experimental investigations are welcome.

Please select the Thematic Symposium: **PRIN 2020 – NGOP**.