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NON-CONVENTIONAL MODELS FOR NANO- AND MICRO-MECHANICS

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ABSTRACT

Current research devotes a great deal of attention to small-size structures, in view of many promising applications in mechanical, aerospace, biomedical engineering. Modelling small-size structures requires ad hoc methods capable of capturing size effects in the response, which cannot be described by classical free-scale local continuum theory. Non-conventional models were developed to this aim, such as nonlocal and generalized continuum models, including the Eringen's integral nonlocal model, stress-driven models, strain-gradient models, classical and modified couple stress models, peridynamic or space-fractional models to mention only a few. Additional complexity in modelling arises from the need to account for time-dependent or multi-physics phenomena. The Mini-Symposium focuses on non-conventional models for nano- and micro-mechanics, including theoretical, computational, experimental and manufacturing aspects.

Topics:

- Size- and time-dependent behaviors
- Advanced nonlocal and generalized continuum theories
- Peridynamic continua
- Space- and time-dependent fractional continuum models
- Multi-physics phenomena
- Linear and nonlinear behaviors (e.g., elasticity, viscoelasticity, damage, plasticity)
- Elastic wave propagation and vibration control
- Inverse problems
- Nano- and micro-architected materials (nano- and micro-lattices, carbon nanotube networks, polymer-metal micro-trusses etc..)
- Manufacturing techniques