

Section Editors:

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Call for Papers

Special Collection on Statistical Physics in Structural Mechanics



Aims & Scope

Imperfections, vibrations, thermal fluctuations, and other sources of stochastic fluctuations drastically affect the equilibrium and out-of-equilibrium behavior of structures, from nano-scale structures enabled by, e.g., DNA nanotechnology and advances in the fabrication of 2-D and 3-D printed materials, to large scale engineered structures subject to extreme events (hurricanes, earthquakes, fires, and so on). The engineering of such structures requires new approaches to ascertain the properties and behavior of such structural systems in and out of equilibrium, from in-service states to failure.

This special collection of the Journal of Engineering Mechanics and its new permanent Section of Nano- and Micromechanics is dedicated to such novel approaches situated at the cross-road of statistical physics, continuum mechanics, and structural mechanics. We invite contributions that are theoretical, simulation-based, or experimental in nature, or a combination thereof. Contributions investigating theories and applications of statistical physics in structural mechanics are particularly encouraged and sought.

Examples include:

- The Impact of Thermal Fluctuations and Imperfections on the Mechanics of micro/nanostructures, e.g., 2D Materials, Nanotubes, DNA Origami, and microfabricated structures.
- The Mechanics of Disordered Structural Materials, e.g., glasses, cement, clays, etc.
- Stochasticity and Uncertainty in Structural Mechanics, e.g., geometry imperfections, materials heterogeneity, structural mechanics in extreme events.
- Fluctuation-based Fracture Mechanics of Heterogeneous Materials and Structures.
- Coarse-Graining Techniques in Structural Mechanics.

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Submission Deadline:

June 30, 2022

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