Wave generation and transmission in multi-scale complex media and structured metamaterials (part 1)

Theme issue compiled and edited by A. B. Movchan, G. S. Mishuris, F. J. Sabina and R. K. Bhattacharyya†

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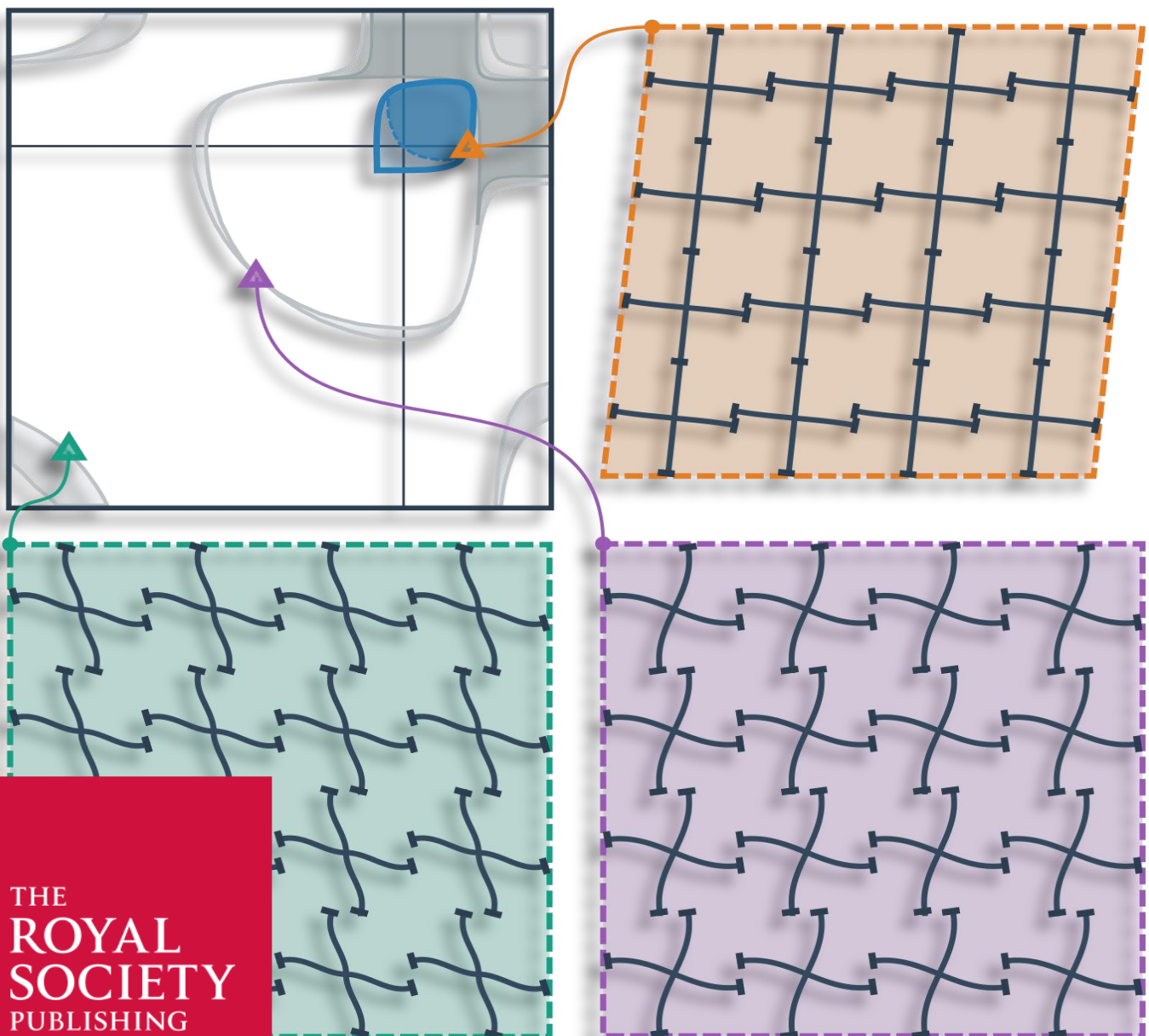
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This two-part theme issue brings together the fields of applied mathematics, solid mechanics, physics, structural and mechanical engineering and environmental science, with the main focus on the mathematics/engineering interface.

The new results presented in the issue, include modelling of transient processes in metamaterials with temporal interfaces, wave scattering in polycrystals, elastic surface waves in structured solids and effects of non-locality, as well as analysis of localised waveforms governed by the fourth-order differential operators in the context of modelling of the dynamics of structured elastic plates.

Modern analytical methods, new theoretical and numerical approaches and experimental novel studies, together with scientific reviews are included in the current theme issue.

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Cover image:
Stability domains and instability modes for a lattice of elastic rods containing sliders and subject to tensile/compressive preload. Macroinstability (loss of ellipticity) in tension occurs at the orange triangle, while microinstabilities in compression are shown at the purple and green triangles. Credit: G. Bordiga, D. Bigoni, A. Piccolroaz "Tensile material instabilities in elastic beam lattices lead to a bounded stability domain".

†Deceased 23 May 2021.

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