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Architected Materials: From Reconfigurability to Nonlinear Waves

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In the search for materials with new properties, there have been great advances in recent years aimed at the construction of architected materials, whose behaviour is governed by structure, rather than composition. Through careful design of the material's architecture, new material properties have been demonstrated, including negative Poisson's ratio, high stiffness-to-weight ratio and mechanical cloaking.
In this talk I will focus on two different types of architected materials. First, I will introduce a robust design strategy inspired by the snapology origami technique to create highly reconfigurable 3D architected materials comprising a periodic assembly of rigid plates and elastic hinges. Then, I will focus on soft architected materials and show that they provide an ideal environment for the propagation of nonlinear waves, since they can support a wide range of effective nonlinear behaviors that are determined by the architecture.