



# ME Faculty Colloquium



## Dipping my toes in nonlinear structural mechanics

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### ABSTRACT

For many engineers, structural mechanics stops at Euler buckling. For others, it starts after. Indeed, an emerging paradigm in mechanics considers geometric nonlinearity and buckling phenomena as features to be exploited, rather than as modes of failure. The principles underlying this emerging field enjoy two distinctive features- dependence on aspect ratios rather than absolute length scales, and near independence from the material constitution. Hence, these principles promise to be useful, say, in examining the mechanics of graphene nanostructures, designing flexible electronic devices, or even deploying structures in space. At the talk, I will discuss my group's approach to studying the mechanics of slender elastic structures. I'll use three examples, proceeding in increasing order of dimensionality- from 1D beams to 1.5D ribbons, to 2D membranes, to highlight the multi-faceted nature of challenges in the field as well as the opportunities for designing novel engineering applications.

### ABOUT THE SPEAKER

Ramsharan Rangarajan is an assistant professor in the Dept of Mechanical Engineering at IISc Bangalore. His research group works on various aspects of nonlinear solid mechanics, encompassing mechanical modeling, numerical simulations and desktop experiments.



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