

**Getting Stuck and Breaking Free:
Free Boundaries and Free Discontinuities in Heterogeneous Media**

Kaushik Bhattacharya

Department of Mechanical and Civil Engineering, California Institute of Technology, USA

Email of Presenting Author: bhatta@caltech.edu

This talk concerns the effective behavior of heterogeneous media with regard to phenomena linked to the evolution of a free boundary or free discontinuity. In these phenomena, the effective behavior is not characterized by averaging, but instead dominated by critical events.

Thus, the effective behavior can be qualitatively different from the local behavior. This offers opportunities for exploiting heterogeneities to dramatically change material properties. This talk will illustrate this with examples drawn from fracture, dislocation dynamics, phase boundary propagation and peeling of thin membranes.