

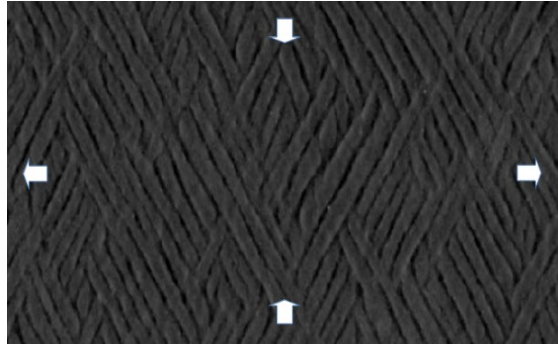


SMSD SEMINAR SERIES

Soft Materials Structures and Devices

Wednesday, January 15th 2020, 4pm, Room 3-370

Mechanics of cohesive granular materials



Fracture pattern observed at the surface of a thin layer of a cohesive granular material. The fractures appear when the layer, deposited onto an elastic membrane, is stretched in one direction and compressed in the perpendicular direction due to the Poisson effect (white arrows).

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The mechanics of granular materials, i.e., assemblies of solid grains in frictional contact, is peculiar. Indeed, such materials are almost incompressible, but the grains can be pulled apart without any significant effort; they form piles and their response to shear resembles more solid friction than fluid rheology, etc. When the grains are small enough, the cohesion between the grains is likely to enter into play. In this case, granular materials deform and, then, fracture rather than to flow. Using a few experiments, we will understand why the macroscopic behavior of the materials is sensitive to the microscopic details. In particular, we will see that, for grains in contact with a humid atmosphere, the inhomogeneity of the cohesion force explains the dependence of the fracture network characteristics on the grain size and the relative humidity.

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Please join us for refreshments beforehand, outside Room 3-370

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