

Non-affine Deformation - Project Titles

Mechanics of Soft Matter Fall 2018

Group No.

1. Studying the role of filament bending in network affinity: Comparing the mechanics of networks with semi-flexible filaments to those with flexible filaments.
(Shouhong and Noah)
2. A detailed study of the percolation phenomena for (a) network connectivity (geometric scaling laws ...) and (b) network mechanics (stiffness or rigidity using Maxwell rules ...).
(Adam and Michael)
3. A critical literature review and analysis of current theoretical models of non-affine deformation in polymer networks.
4. A case study on mechanical sensing in natural networks through non-affine deformation (ex. the mechanics of spider webs).
(Alize and Tania)
5. A case study of the mechanics and non-affine modes of deformation for a granular material (ex. sand, foam, powders (like coffee), rice, etc.)
(Morgan and Christie)
6. Investigation of the role of the coordination number in non-affine deformation as predicted by the phantom network theory. Involves experimental work on 3-D printed networks with different coordination numbers and testing.
(Brittany and Karl)
7. Investigation and comparison of non-affinity in mechanical deformation of isotropic networks (with completely random fiber orientation) and anisotropic networks (with preferential fiber orientation).
(Randy and Kevin)