

Abstract Submitted
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Rearrangement Dynamics in Dense Particulate Systems¹ DOUGLAS DURIAN², University of Pennsylvania — Together at Penn, Jerry Gollub and I jointly supervised the PhD theses of two superlative graduate students as part of Penns MRSEC: Kerstin Nordstrom (assistant professor, Mount Holyoke) and Jennifer Rieser (postdoc, Georgia Tech). In this talk I will review Kerstins work on dynamical heterogeneities in a compressed suspension of hydrogel particles under shear. In particular, flow is mediated by intermittent rearrangements that diverge in size as a universal power law of the local relaxation time, i.e. the reciprocal of the strain rate for this system. But how can one tell where rearrangements are likely to occur, and whether they will encourage or discourage further rearrangements nearby? This bears on the age-old question of ductile versus brittle response to large-scale deformation, which we are now tackling by analysis of experiments using Machine Learning methods to classify the local structural environment of each particle.

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²In honor of Jerry Gollub

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