81st MSS-Seminar

Wednesday, December. 9, 15:30

Nägelsbachstr. 49b

MSS

Soft granular rheology

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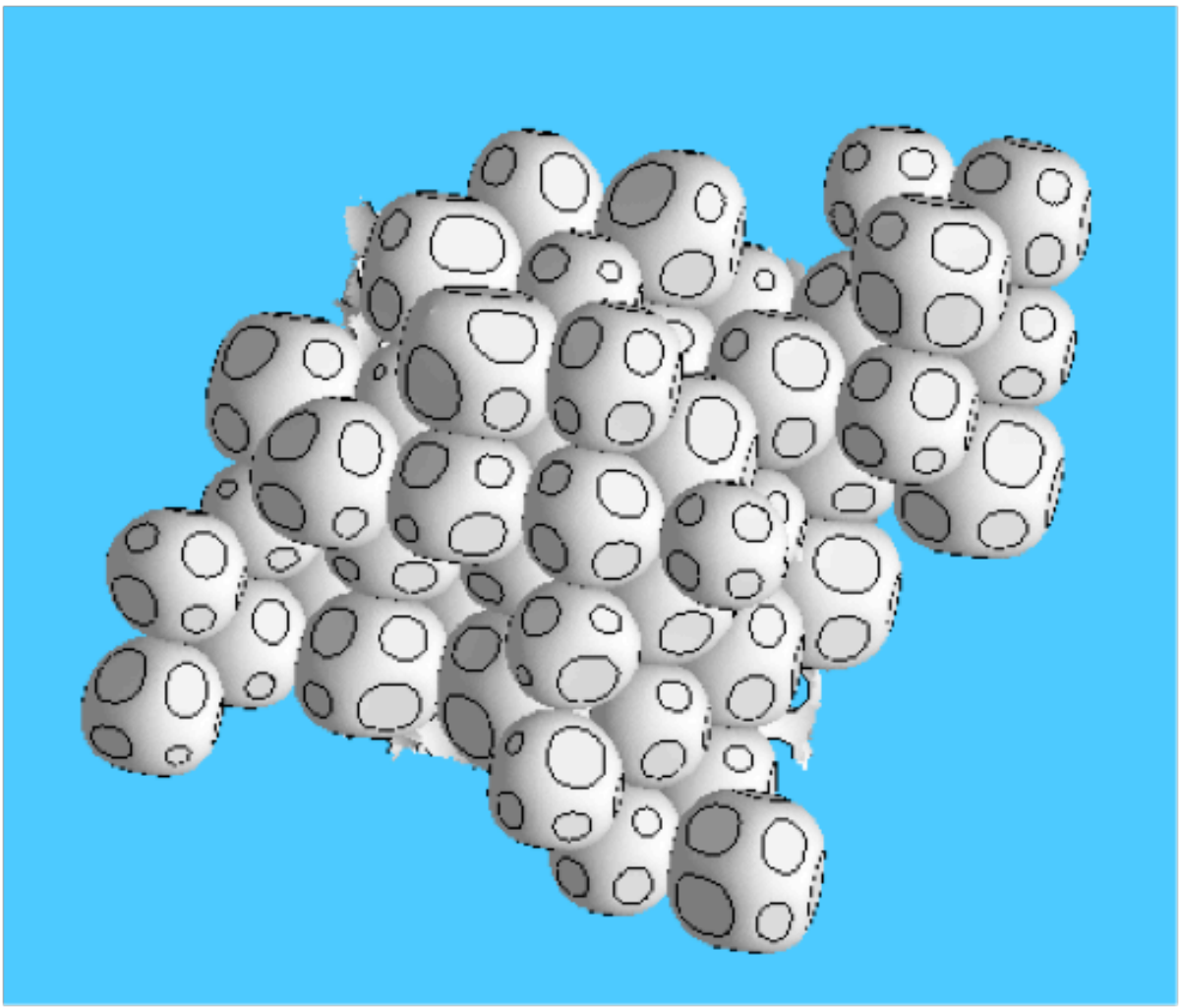

At packing fractions near the jamming transition, the static microstructure of foams, emulsions and soft pastes is similar to a random close packing of soft spheres. These materials are often considered as model systems of granular materials made of solid beads, because the absence of static inter-particle friction simplifies the mechanical behavior. Experiments and simulations show that near the jamming transition, the rheology of foams and granular suspension are indeed governed by similar constitutive laws. However, I will also show that interactions of soft particles like bubbles and droplets cannot be captured by a two-body interaction law, in contrast to the paradigm used in many generic simulation studies. I will present a many-body bubble interaction law that is derived from first principles and that is validated by ab initio simulations of disordered foam microstructures, illustrated above.