

- Phd proposal 2023 -

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flow of powders



How grains flow? Can we predict the behavior of sand, snow, powders and more generally of a collection of particles? In many situations both in nature or industry, this question is of importance to predict avalanches, landslides, or designing silos and industrial processes. The last two decades, a lot of progress have been achieved in our understanding and prediction of materials made of large grains interacting by friction and collision. However, in many applications, grains present cohesion and predicting their behavior is much more challenging. Sticky or humid grains, powders, snow are examples of cohesive media having difficulties to flow, experiencing clogging, agglomeration, intermittency. The proposed Phd is part of a project trying to develop a fundamental understanding of the behavior of cohesive granular materials, by combining experimental and numerical approaches. The experimental part consists in studying the behaviors of model materials with controlled adhesive properties. The numerical approach is based on discrete element methods. The program of the Phd may be adapted depending on your inclination to experimentation or numerical simulations.

The Phd will take place in the "Soft" group, a collaborative research team working on the physics of complex media, from granular flows to bio-inspired systems.