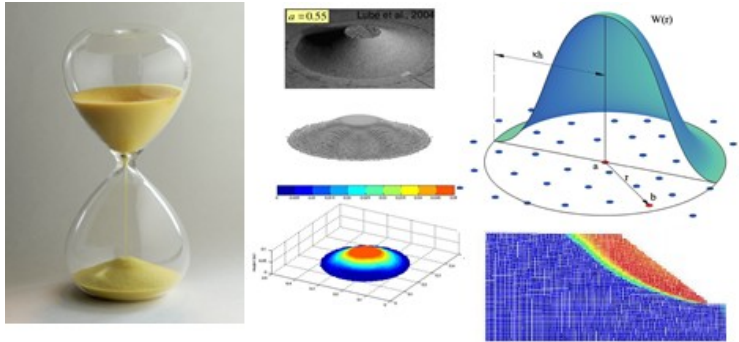


Master's Thesis

Simulation of Granular Flow in Smoothed Particle Hydrodynamics (SPH)

Supervisors: MSc. Abdiel Leon, MSc. Rodolfo Williams



Background: Granular matter exhibits a complex fluid-like behavior, flowing like a (rate dependent) non-Newtonian fluid, when subjected to large deformations and continued shearing. Finding a suitable modeling framework has proven to be, however, a formidable challenge due to the significant geometrical and material non-linearities characterizing this kind of problems. In this sense, the Smoothed Particle Hydrodynamics (SPH) comes as a highly promising and robust particle-based numerical strategy when dealing with large deformations and changing geometries.

Tasks: Within this master thesis the following tasks are to be completed:

- Literature review of the SPH method
- Implementation of a constitutive law for the modeling of rate dependent granular flows in an existing SPH open source code
- Code validation via classical numerical benchmarks and (minimum) one example concerning a geotechnical application dealing with large deformations. This thesis may be written either in English or German.

Contact:

MSc. Abdiel Ramon Leon Bal
Raum: IC 6 / 161
Lehrstuhl für Statik und Dynamik
Tel: 0234-32-27792
Email: Abdiel.LeonBal@rub.

MSc. Rodolfo Williams
Raum: IC 6 / 169
Lehrstuhl für Statik und Dynamik
Tel: 0234-32-29059
Email: Rodolfo.WilliamsMoises@rub.de