

# Chapitre 1

## General presentation

*What is a granular material ?*

### 1.1 A polymorphic object

A granular material is a system composed of a huge number of small interaction units, called *grains*. To understand this definition, we need to explain exactly how *huge* we expect the number of grains to be, and exactly how *small* we expect the grains to be.

By "a huge number of grains", we mean a number so huge that we can start using macroscopic quantities to describe the collection of grains. In other words, we want to be able to see the collection of grains as a whole, which we will call *the* granular material. This huge number can in fact be surprisingly small compared for example to the number of molecules in one cubic meter of air ( $10^{25}$  molecules at usual temperature and pressure), or even to the number of water molecules in a water droplet ( $10^{15}$  in a  $500\text{ }\mu\text{m}$  diameter droplet).