Exercise 1
Build a 3D OpenGL core interactive application for the simulation and visualization of a gas as a particle system

The gas, which is represented by *p* particles (you can use a small sphere for each particle) is initially confined inside a a cube having side *l.* The small cube is located within a wider cube having side equal to 2l, as shown in Fig. 1.

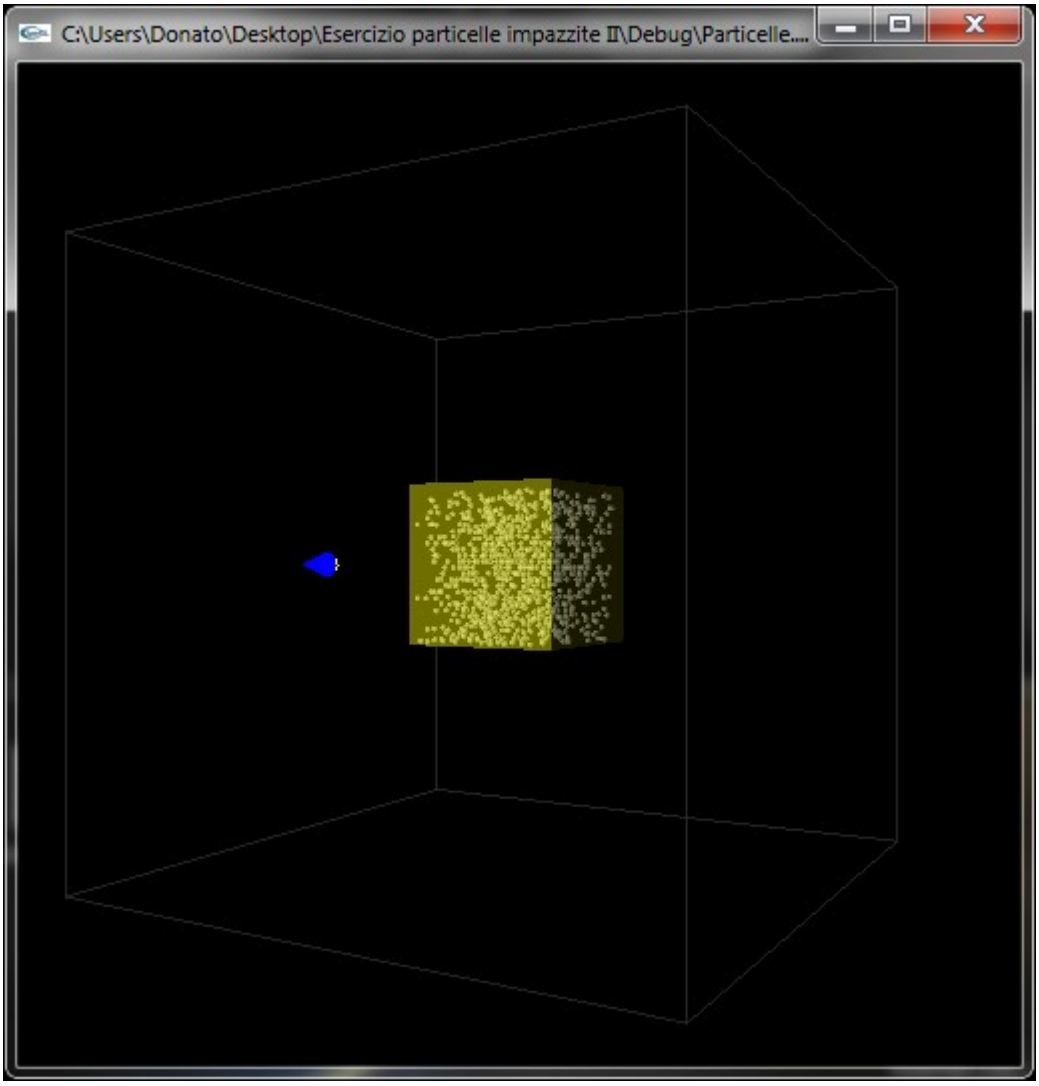

Fig. 1: Initial condition for the particle system.

At each iteration, particles can move by one unit lenght in any of the 3 directions (for the sake of simplicity, do not care about particle collision). Particles are however forced to be confied within the wider cube. After *n* iterations, particles will be approximately distributed within the wider cube in a uniform way, as shown in Fig. 2.

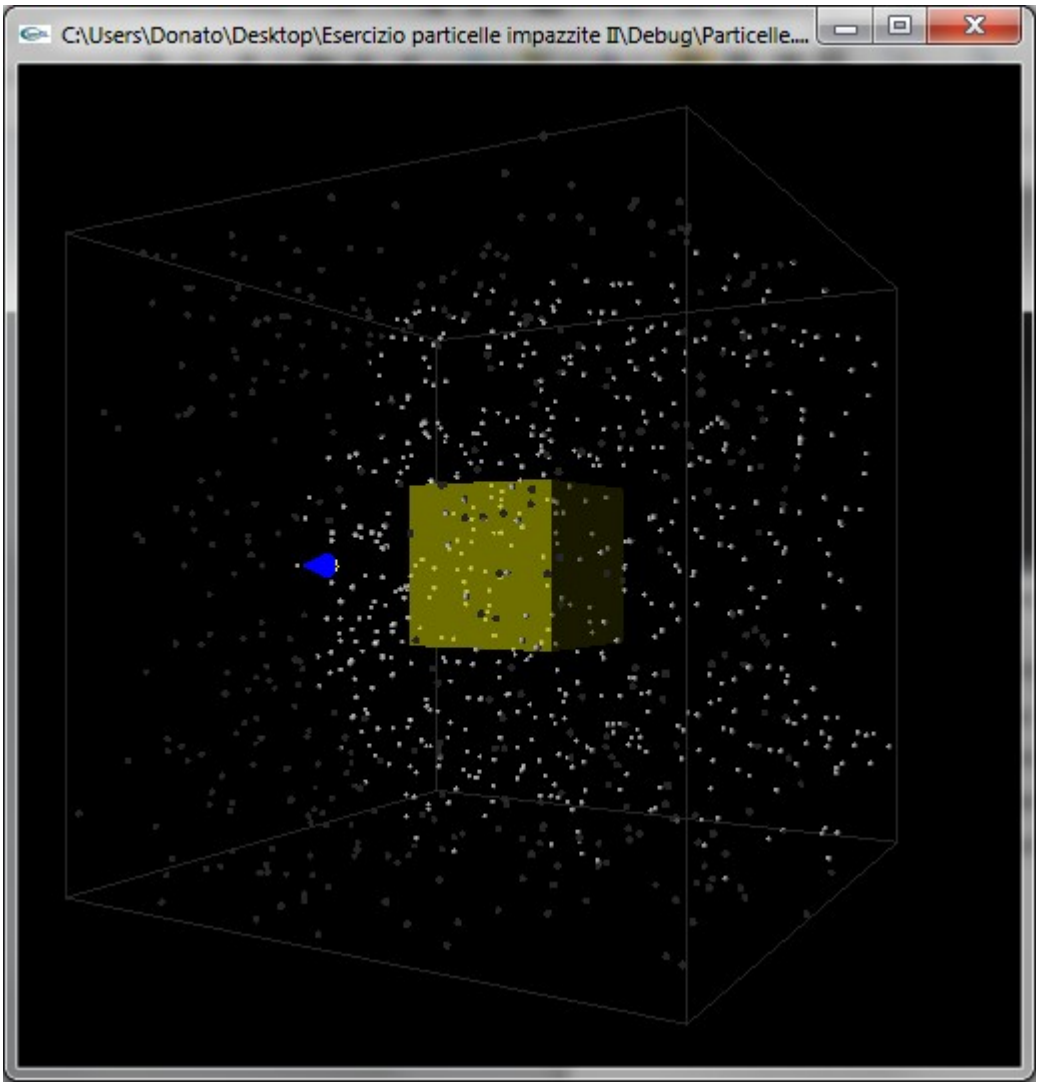

Fig. 2: The particle system after *n* iterations.

The application must use a spot light and also allow to move it within the scene. Obviously, it should be possible to transform the particle system in order to observe it from different points of view.