Running a simulation with Gadget-2

The purpose of this exercise is to show how to run a simple simulation with Gadget-2.

1. Download and *untar* the file: www.fys.ku.dk/~msparre/Exercise.zip

2. Compile Gadget-2 with the options in the Makefile in the Exercise-directory

   You have to modify the lines below
   "#------------------------------------ Select target computer" so it matches your computer

3. Copy the Gadget2-executable to the "substructure"-directory (it is a directory in the Exercise-directory)

4. The substructure-directory contains the following files:

   Substructure.param: A **parameterfile** where input options for Gadget-2 are specified.

   Substructure50000.bin: A binary file with **initial conditions** (mass, position and velocity for all the particles) for 50000 particles distributed according to a spherical symmetric density profile, $\rho \sim 1/r * 1/(1+r)^3$ in units with G=1. The structure contains 50% substructure.

   Output: The directory where the output-files are written.

   Execute the following command to run the simulation:

   mpirun -np 2 ./Gadget2 Substructure.param

   With this command the simulation will use 2 CPUs. If you have 4 CPUs you should change the "2" to "4" (the number after -np) in order to use all CPUs.

   It will probably take 15 minutes to run the simulation on a normal laptop.

5. When the simulation is finished many snapshot files have been produced in the Output-directory.

   You can convert the output-files to ascii-files with the program gadget2ascii (compile it with "make"), which can be found in the Exercise-direcrory.

   To convert the file Substructure_000 to ascii use the following command:

gadget2ascii Substructure_000 > 000.ascii

The file 000.ascii will then contain the positions for all the particles. The system can be plotted in Gnuplot with the following commands:

```
set xrange [-10:10]
set yrange [-10:10]
set zrange [-10:10]
spl '000.ascii'
```