

Week 7 — *Manipulating Paraview* *Kepler orbits*

The goal of the present exercise is to make our first use of Paraview. We will analyze planet trajectories.

Exercise 1: *Importing planet trajectories*

1. Install Paraview. Under linux you can type

```
sudo apt-get install paraview
```

Otherwise, you have to go to the download page <http://www.paraview.org/download/> and follow the instructions.

2. Pull the particle trajectories file from the GIT. You will have a set of files named *step-XXXX.csv*.
3. Open Paraview
4. Click to the open menu, and load the pack of files altogether. Paraview should detect the *csv* format.
5. In the *Properties* tab change the delimiter to be a simple space character. You should see a table of numbers corresponding to planets.
6. To visualize in 3D, we have to declare to Paraview which are the coordinates. To do this we create a set of points by using the filter *Table To Points* from the filter menu. You have to select which columns are the X, Y and Z coordinates in the *Properties* tab. You can observe the pipeline that we are constructing in the *pipeline browser*.
7. The eye button in the pipeline browser lets you display data in the render area. You can now hit the start button (on top) to play the recorded simulation. The planets are moving very slowly. This is because the timestep was set to be one day. Can you identify the earth ?

Exercise 2: *Assigning spheres to the planets*

1. Eventually we would like to assign spheres to the planets. You can use the *Glyph* filter. In the *Properties* tab you have to set a glyph type to *sphere*, change the scale mode to *scalar* and the scale factor to 1. On the top of the *Properties* tab you have to select the *Radius* scalar field (to scale with the radius scalar field). Change glyph mode to "All points". Then Apply. What did happen ? Why ?
2. Try to change the scale factor so as to see the planets: you should realize how big our sun is when compared to all planets.
3. In order to visualize in better conditions, we want to scale the planets and the sun with different scale factors. In the pipeline tab select the set of points we created. Close the 3D view and open a spreadsheet view on this last. Then select all lines but the sun and call the object *ExtractSelection* filter to generate a set of points without the sun.
4. Then apply a Glyph filter with a different radius for the planets and for the sun.
5. Use the filter *Temporal Particle to Path lines* to draw the trajectories of individual planets.