

### Lesson 5.9: Exercise Instructions for Students

Exercise 1: Take the provided MPI code and change GlobalNbodies to be 10000. How does the code scale with the number of processors? Repeat the process with GlobalNbodies=1000000, how does that change the scaling? (NB: the BEST case scenario for small numbers of processors is multiplying the run time by something just under 100 -- as such you may encounter walltime limitations [either imposed by your system, or just the due date of your assignment] if you run with too few processors).

Exercise 2: Rewrite the IO section such that all the data for a particular time is gathered to process 0 and then written with the usual C++ fwrite command. Is the IO faster or slower than MPI collective routines? By how much?