Project 4/2014: "**Parallelisation, new developments and first science with GANDALF**"

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Abstract:
We are developing a new hybrid SPH/N-body code called GANDALF to be used for star cluster, star and planet formation simulations. It is written in C++ with OpenMP along with a python library which can be used to analyse, visualise and interactively run simulations within a python script. The project has two main aims :
(i) Further develop the parallelisation of the code using an OpenMP/MPI approach to take advantage of current-day super-computing architecture. We will also develop new parallel physics modules, such as radiation transport.
(ii) Run a suite of star formation simulations investigating the fragmentation of turbulent prestellar cores. We intend to perform (a) a larger suite of simulations with improved statistics, (b) simulations with a range of core masses to demonstrate how final stellar and binary properties vary with initial conditions, and (c) convergence studies to determine how much resolution is required in such simulations.