

## ASTR 5820: Dynamics Project

The aim of the final project is for you to identify and explore a problem in planetary or astrophysical dynamics. Examples could include: studying the stability of orbits in known extrasolar planetary systems; exploring the stability of orbits in binary star systems; investigating the effect of a close stellar flyby on the outer Solar System etc etc. The goal is primarily to gain experience at using tools that may be useful to you later, so the more novel the better!

For a numerical / computational project, you are *not* expected to write any code (in fact, reinventing the wheel in this way is strongly discouraged). Rather, install and make use of one of the many publicly available N-body codes, links to which are provided on the web page. For relatively 'easy' problems (i.e. those requiring integrations lasting thousands rather than millions of orbits) one of the simpler codes, such as the Hermite code on Piet Hut's website ought to suffice. For very long term planetary integrations, you'll need to use a more sophisticated tool such as Mercury or SWIFT.

An analytic project is also possible, in which case you might review some important result in dynamics (e.g. Goldreich & Tremaine's work on satellite-disk interactions) and discuss its applications and limitations.

Results may *either* be written up as a short paper (no minimum / maximum length, write whatever's appropriate), or presented orally during the last week of the semester. I will book one of the seminar rooms for a late afternoon / early evening slot for most of the presentations. Working in groups of two is encouraged.