

PGF5299: Physical Cosmology II

Final Project

For the Final Project, you will perform a **numerical** calculation and write a **paper** about a topic in Cosmology. The paper will comprise 50% of your total grade. It is highly recommended that you start working on your Final Project as soon as possible (not later than the middle of the semester), so that you have time to do a good job at the end.

Rules:

- 1) Your paper must be written in LaTeX.
- 2) Your paper **must** include numerical calculations and figures made by yourself related to your project (e.g. you make a χ^2 minimization or MCMC analysis, or you implement a numerical calculation of the number of clusters in a galaxy survey, and make plots showing results, etc). *Failure to do so will decrease your grade considerably.*
- 3) Your paper should preferentially be written in English, in which case you will get up to 0.5 extra point.

You **may** choose one of the topics below. If you would like to work on something completely different from the topics listed below, talk to me first so we can discuss about something that is appropriate for the course.

Topics:

Cosmology from CMB Observations (e.g. WMAP, Planck).

Cosmology from Galaxy Correlations (Cross-correlations) and Power Spectra (Cross-spectra);

Cosmology from Gravitational Lensing;

Cosmology from Galaxy Clusters;

Cosmology from Supernovae Ia;

Non-linear Perturbation Theory in Correlations and Power Spectra;

Halo Finders and/or Cluster Finders and/or Void Finders;

Halo Model in Cosmology;

N-Body Simulations in Cosmology;

Photometric Redshift Methods and Applications;

MCMC Parameter Estimation in Astrophysics and Cosmology;

Constraining Models of Cosmic Acceleration from Observations.