Professor Andrea Maccio

Capstone Project in Physics/Caomputer Science supervised by Professor Andrea Maccio
Email: avm4@nyu.edu

"Visualization of Galaxy formation simulations: a 3D view"

- Galaxy formation simulations are a powerful tool to unveil the evolution of the cosmos.
They are also very expensive (several weeks using several hundreds of cpus) and consist of very large files (~100 Gb each). This makes quite impossible to save enough snapshots to create smooth movies, or to change the camera position and the projection, as for example for a spherical dome of a planetarium.

Movies need to be created "on the fly" or need to be smoothed out from a limited number of snapshots.

In this project we aim to improve the (so far limited) capability of our code Gasoline2.0 (C based) to create "professional" animations both on the fly and both using smoothing algorithm to balance the limited number of frames available

We also want to create 3D animations based on light polarization to be displayed on 3D television and projectors.

Goals:
- Add an adjustable camera within the code
- Produce animations with different projects (e.g. fish-eye)
- Include transparencies effects during the fly in through the simulations
- Create 3D movies.