

# Simulating the Evolution of the Galaxy Luminosity Function from $z=6$ to the Present.

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Total Budget Amount: \$48,000 (See page 8 for details.)

Theory: Yes

## Abstract

Using hydrodynamical simulations of galaxy formation we will provide (1) updated predictions for the luminosity function of galaxies in HST and Spitzer bands from  $z \sim 6$  to the present and (2) study the physical mechanism that drives its evolution.

Particular emphasis will be on providing results easily comparable with the real observations: Using the code Sunrise (developed by P.Jonsson, UCSC) we will produce artificial images at kpc resolution for thousand of galaxies to obtain individual magnitudes and light profiles in HST and Spitzer bands that keep into account the detailed geometry of each galaxy and a self consistent treatment of dust reprocessing of light sources.

The simulations will consists of a large, 800 million particles SPH simulation of a 50 Mpc cosmological volume and of several very high resolution simulations of individual galaxies in a cosmological context. While the large volume will provide us with a large statistical sample, the high resolution simulations will allow us to identify the physical mechanisms (cold flows, energy feedback, mergers) that drive the evolution of the galaxy Luminosity Function at different masses and cosmic times. This double approach will allow us to properly evaluate any numerical effects present in the simulations.

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	Investigator	Institution	Country
PI	Prof. Fabio Governato	University of Washington	USA/WA
CoI	Dr. Chris Brook	University of Washington	USA/WA
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Number of investigators: 6

**Dataset Summary:**

Instrument	No. of Datasets	Retrieval Method	Retrieval Plan
	0		