

# Projet Horizon - Horizon Project

-- The Horizon Project - Project --

Project

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**Project**

Legrand François  
Tuesday 13 September 2005

<PDF\_LINK> The HORIZON Project has the objective to federate numerical simulations activities around a program focussed on Galaxy Formation. In a context favoring initiatives in scientific computing, the PNC (Programme National Cosmologie) the PNG (Programme National Galaxies) and the PAP (Programme AstroParticule), express their needs to stimulate and coordinate individual efforts among each domain.

The HORIZON Project has the goal to gather several research teams in different institutes. The scientific objective is specifically oriented on galaxy formation in a cosmological frame. The HORIZON Project has not the vocation to cover exhaustively all research themes in the two domains of Galaxies and Cosmology. Its transverse and federative nature will however allow to develop in a few years high-level competences in parallel and distributed (GRID) computing, in data bases of virtual observations, as well as in applied mathematics, and build in the same time a strong theoretical knowledge in astrophysics.

The main objectives are:

- Numerical study of galaxy formation in a cosmological frame
- Develop advanced techniques in parallel programming and in applied mathematics to simulate galaxy formation and predict their observational signatures, as a function of physical parameters
- Gather several experts to exchange their competences, share their software, and rationalise the access to national computing centres
- Provide the community, and in particular AstroParticle, PNC and PNG communities, observers and theoreticians, a friendly access to numerical results of international level

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## I. Organisation

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## PI and co-PI of HORIZON Project

- PI: [Romain TEYSSIER](#) (CEA, Saclay)
- co-PI: Jean-Michel ALIMI (LUTH, Observatoire de Meudon)
- co-PI: Stéphane COLOMBI (IAP, Paris)
- co-PI: Françoise COMBES (LERMA, Observatoire de Paris)
- co-PI: Bruno GUIDERDONI (CRAL, Lyon)

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## II. Objectives

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The HORIZON Project is organised in 4 large thematic actions. Inside each theme, well identified task packages can be found, and for each task a task manager, a calendar and deliverable products.

The 4 thematic actions are:

- Mathematics applied to galaxy formation
- Parallel programming and distributed computation
- Virtual observations and data bases
- Physical processes and initial conditions

Three scales of simulations will be produced by the HORIZON Project:

- Large-scale simulations
  - One Cosmological Horizon (Hubble volume) simulation
  - Several simulations of Large-Scale Structures
  - Several zoom-simulations of galaxy clusters
- Galaxy-scale simulations
  - Several simulations of "Lyman-alpha" filament forest
  - Several zoom-simulations of galaxies
- Small-scale simulations
  - Some simulations of the re-ionization epoch
  - Several zoom-simulations of first stars formation

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## III. Documents

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Thursday 21 September 2006



PNC\_PNG\_08 Présentation Horizon par Romain Teyssier



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