Workshop
« Cosmic Topology between WMAP and PLANCK : Facts and Theories »

Observatoire de Paris-Meudon, CIAS
8-10 march 2005

Organizer : Jean-Pierre Luminet (LUTH)

Purpose

After WMAP cosmic microwave background observations (2003), which found many unusual statistical properties on the largest angular scales, much interest has developed in trying to find clues to the topology of the Universe. Both the WMAP observations and supernovae Ia data sets suggest that the Universe is spherical, with a radius of curvature at least as large as the horizon radius. In addition, some theoretical interpretations of the observed low quadrupole and octopole suggest that the spatial comoving sections of the Universe is a Poincaré spherical dodecahedron. This kind of model implies tight constraints on the cosmological parameters as well as on the physics of early universe (e.g. inflationary models).

The aim of the workshop is to review ongoing researches in the field of cosmic topology and prepare future tests accessible to the forthcoming PLANCK experiment (2007). In particular, the following topics will be discussed (non exhaustive list) :

- searches for pairs of correlated circles in WMAP data
- survey of topology detecting methods
- simulations of CMB maps in spherical topologies
- geometrical and cosmological properties of spherical spaces (eigenmodes, etc)
- topology and breakdown of global isotropy
- topology and CMB polarization
- detection of topology on superhorizon scales
- topology and inflation

Participants : ~ 15 (minimum)

Invited speakers (out of France)

Aurich, Ralph (Univ. Ulm, Germany)
Dowker, Jay (Univ. Manchester, UK)
Gundermann, Jesper (Copenhagen, Denmark) – *confirmed*
Marecki, Andrezj (Torun, Poland) -- *confirmed*
Rebouças, Marcelo (Un. Rio de Janeiro, Brésil) -- *confirmed*
Roukema, Boud (Torun, Poland) -- *confirmed*
Weeks, Jeffrey (Canton, USA) -- *confirmed*

French participants :

François Bouchet (IAP)
Samuel Caillerie (Orsay)
Marc Lachièze-Rey (Saclay)
Roland Lehoucq (Saclay)
Jean-Pierre Luminet (Meudon-Luth)

Simon Prunet (IAP)
Alain Riazuelo (IAP)
Jean-Philippe Uzan (IAP)