



Universidade Federal da Paraíba
Centro de Ciências Exatas e da Natureza
Programa de Pós-Graduação *Stricto Sensu* em Física

Colóquio

“Is finite or infinite the Universe where we live?”

RESUMO: Cosmologists assume that the Universe can be described by a four-dimensional space-time manifold endowed with a locally homogeneous and isotropic spatial geometry. Mathematicians characterize manifolds in terms of their geometry and topology. Thus, two fundamental questions regarding our description of the Universe concerns its spatial geometry and topology. Geometry is a local quantity that gives the curvature of the 3 -space. Topology is a global feature that characterizes its shape and size. What is the topology of the spatial section of the Universe, whether it is finite and what is its size and shape may be among the fundamental open problems that high precision modern cosmology can potentially resolve. These questions have become particularly topical, given the wealth of increasingly accurate cosmological observations, especially the recent observations of the cosmic microwave background radiation (CMB) made by the Planck satellite. Despite our present-day inability to predict the topology of the Universe we should be able to devise strategies and methods to detect it by using observational data. In this talk I shall present a brief overview of the basic features of cosmic topology, examine the most important recent theoretical results in the field, and discuss some attempts to determine the topology of the spatial section of the Universe, particularly the recent search for a non-trivial spatial topology made with the CMB data assessed by the Planck satellite of European Space Agency (ESA).

<p>Prof. Dr. Marcelo Rebouças CBPF</p>
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