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NITheCS National Institute for Theoretical and Computational Sciences

This hybrid event is co-hosted by NITheCS and the Department of Physics, Stellenbosch University:

COLLOQUIUM

Mapping the Initial Conditions of the Universe using the Cosmic Microwave Background

Speaker: Prof Martin Bucher (Université Paris Cité/CNRS, Paris, France & NITheCS)

Date: Friday, 12 August 2022
Time: 15h00 SAST

Venue: Lecture Hall Delta (Room 1011), Merensky Building, Stellenbosch University
ALSO attend online

ABSTRACT

In the 1980s a plethora of new theories such as inflation and topological defects were put forth linking new physics beyond the standard model and the large-scale structure and initial conditions of the universe. However, at that time little relevant data was available to test these theories.

Observations of the cosmic microwave background (CMB) have played a central role in establishing cosmology as a real science where the range of plausible speculation is tightly constrained by observation. Even though today many open questions remain, the general outlines of the correct model are believed to be known, and we believe to have characterised the cosmological parameters and initial conditions for structure formation at about the percent level.

I will review the state of theory prior to the precision measurements of the CMB anisotropy now available, thanks largely to the ESA Planck mission, and explain how these observations have changed our understanding of what took place in the early universe. I will also discuss how future CMB observations should lead to even tighter constraints on what happened in the early universe.

ENQUIRIES

Prof Herbert Weigel (weigel@sun.ac.za)

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