

# Observational imprints of non-trivial inflationary and post-inflationary dynamics over small scales

**Date** 15:30 - 16:30, 2021/12/6 (Monday)

**Place** 1330, Building 9 (Zoom ID: 819 1952 4070)

## Speaker

Prof. Lakshmanan Sriramkumar

Department of Physics, Indian Institute of Technology Madras



## Abstract

The primordial scalar power spectrum is well constrained over large scales, essentially by the observations of the anisotropies in the cosmic microwave background. However, the current bounds on the scalar power spectrum over small scales are considerably weaker. During the last few years, there has been an interest in examining scenarios which generate enhanced scalar power on small scales and lead to significant production of primordial black holes as well as induce secondary gravitational waves (GWs) of possibly detectable amplitudes. In this talk, I shall first outline some of the inflationary scenarios we have examined in this context. Thereafter, I shall describe the scalar bispectrum arising in such scenarios in single field models of inflation and discuss the corresponding imprints on the spectral density of secondary GWs. I shall then illustrate the difficulty in generating enhanced power on small scales from squeezed initial states. Lastly, I shall highlight the manner in which non-trivial post-inflationary dynamics can leave telltale imprints on the spectral density of primary GWs at small scales.

## Biography

L. Sriramkumar is a Professor of Physics at the Indian Institute of Technology Madras, Chennai, India. He had completed his thesis work under the supervision of Prof. T. Padmanabhan at the Inter-University Centre for Astronomy and Astrophysics, Pune, India, in 1997. He had worked as a postdoctoral fellow under the mentorship of Prof. Jacob Bekenstein (at the Racah Institute of Physics, Hebrew University, Jerusalem, Israel) and Prof. Don Page (at the Department of Physics, University of Alberta, Edmonton, Canada) during 1997-99 and 1999-2001, before joining the Harish-Chandra Research Institute, Allahabad, India, initially as a post-doctoral fellow in 2001, and then as a faculty in 2003. He had moved to the Indian Institute of Technology Madras in 2011.