

Review on the generation of large-scale magnetic fields in inflationary cosmology

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Speaker

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Abstract

It is known that cosmic magnetic fields are observed not only in galaxies but also in clusters of galaxies. The origin of such a large-scale magnetic field is not understood well. One of the most natural origin of large-scale magnetic fields is the quantum fluctuations of the electromagnetic fields in the inflationary stage. To produce the quantum fluctuations of the electromagnetic fields, the conformal invariance of the electromagnetic fields must be broken. In this presentation, in the former part we review the generation of large-scale magnetic fields in inflationary cosmology through the breaking of the conformal invariance of the electromagnetic fields owing to non-minimal coupling of the electromagnetic fields with a scalar field or the gravitational field. In the latter part, we explain our original works related to the magnetogenesis from inflation.

Biography

Prof. Dr. Kazuharu Bamba obtained his Ph.D in 2006 from Osaka university. After working in postdoctoral positions in Japan and Taiwan, he worked at Kobayashi-Maskawa Institute as an assistant professor in 2010 - 2014, and at Ochanomizu university as a lecturer in 2014 – 2015. He joined in Fukushima university as an associate professor since 2015.