Accelerating Universe in the Dark

March 4, 2019 - March 8, 2019

Kyoto University

Scientific Program

Rationals

Dark matter is responsible for the formation of cosmic structures such as galaxies in the Universe, while dark energy is responsible for the accelerated expansion in the Universe. Dark matter and dark energy make up about 95% of our Universe. What are dark matter and dark energy? Or is the cosmic acceleration due to breakdown of the Einstein’s gravity theory on cosmological scales? The nature of these dark components is the most profound mystery in physics and cosmology.

Large-scale structure (LSS) is a powerful cosmological tool to study the distribution of dark matter as well as explore the nature of dark energy. There are various promising LSS methods: weak gravitational lensing, galaxy clustering, redshift-space distortion effects, clusters of galaxies and eventually 21cm cosmology. To have high-precision measurements of these LSS probes, there are a number of ongoing and planned projects aimed at unveiling the nature of the dark components. However, in order to attain the full potential of these projects, scientists need to resolve a number of statistical, computational and theoretical challenges in LSS. The aim of this conference is to gather experts in LSS, both in theory and from various collaborations, to understand the current status of LSS methods and data as well as discuss the roles of future surveys.