

Date/Time: 24th November (Thur.) 15:30 ~

Title: Massive gravitons as dark matter and gravitational waves

Speaker: Katsuki Aoki (Waseda University)

Place: Kenkyu Honkan 1F Meeting Room 3

Abstract:

The massive graviton has long received much attention from both the theoretical and phenomenological perspectives. We consider the possibility that the massive graviton is a viable candidate of dark matter in the context of bimetric gravity which contains a massive graviton as well as a massless graviton. We first derive the energy-momentum tensor of the massive graviton and show that it indeed behaves as that of dark matter fluid. We then discuss a production mechanism and the present abundance of massive gravitons as dark matter. Since ordinary matter fields couple with both mass eigenstates of gravitons, production of massive gravitons, i.e. the dark matter particles, is inevitably accompanied by generation of massless gravitons, i.e. the gravitational waves. Therefore, in this scenario some information about dark matter in our universe is encoded in gravitational waves. For instance, if LIGO detects gravitational waves generated by the preheating after inflation then the massive graviton with the mass of about 0.01 GeV is a candidate of the dark matter.