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Yuichiro Tada: Primordial black hole tower: Dark matter, earth-mass, and LIGO black holes

Friday, 6 December 2019 13:00 (20 minutes)

We investigate a possibility of primordial black hole (PBH) formation with a hierarchical mass spectrum in multiple phases of inflation. As an example, we find that one can simultaneously realize a mass spectrum that has recently attracted a lot of attention: stellar-mass PBHs (~O(10)M_\odot) as a possible source of binary black holes detected by LIGO/Virgo collaboration, asteroid-mass (~O(10^-12)M_\odot) as a main component of dark matter, and earth-mass (~O(10^-5)M_\odot) as a source of ultrashort-timescale events in Optical Gravitational Lensing Experiment microlensing data. The recent refined de Sitter swampland conjecture may support such a multiphase inflationary scenario with hierarchical mass PBHs as a transition signal of each inflationary phase.