Contribution ID: **147** Type: **not specified**

Heavy graviton dark matter in bimetric theory

Wednesday 13 July 2016 08:50 (20 minutes)

Observational evidence for the existence of Dark Matter is limited to its gravitational effects. The extensive program for dedicated searches has yielded null results so far, challenging the most popular models. Here we propose that this is the case because the very existence of cold Dark Matter is a manifestation of gravity itself. Indeed, the only known ghost-free extension of General Relativity to additional spin-2 fields, bimetric theory, automatically contains a perfect Dark Matter candidate. The massive spin-2 particle can be heavy, stable on cosmological scales, and that it interacts with matter only gravitationally. Remarkably, these features persist in the same region of parameter space where bimetric theory satisfies current gravity tests. The observed Dark Matter abundance can be generated via freeze-in. Heavy graviton Dark Matter can be singled out in indirect detection experiments via its universal decay into all standard matter channels.

Summary

Observational evidence for the existence of Dark Matter is limited to its gravitational effects. The extensive program for dedicated searches has yielded null results so far, challenging the most popular models. Here we propose that this is the case because the very existence of cold Dark Matter is a manifestation of gravity itself. Indeed, the only known ghost-free extension of General Relativity to additional spin-2 fields, bimetric theory, automatically contains a perfect Dark Matter candidate. The massive spin-2 particle can be heavy, stable on cosmological scales, and that it interacts with matter only gravitationally. Remarkably, these features persist in the same region of parameter space where bimetric theory satisfies current gravity tests. The observed Dark Matter abundance can be generated via freeze-in. Heavy graviton Dark Matter can be singled out in indirect detection experiments via its universal decay into all standard matter channels.

Primary author: URBAN, Federico (KBFI)

Presenter: URBAN, Federico (KBFI)

Session Classification: Parallel VI

Track Classification: Dark Matter, Dark Energy, Astroparticle