



Contribution ID: 145

Type: **Invited Talks**

Cosmology potential with a decihertz gravitational wave observatory

Wednesday, 25 January 2023 12:00 (30 minutes)

The direct detection of gravitational waves (GW) by groundbased laser interferometric detectors, operating in the ~ 10 Hz to a few kHz frequency band, and electromagnetic (EM) follow-up of GW events have added a new dimension to observational cosmology. A GW observatory in the decihertz frequency band can open yet another significant window to the universe, like observatories in various EM bands have done in the past. A decihertz GW observatory promises various interesting science cases which may not be meaningfully pursuable otherwise. It can bring a major boost to the number of EM follow up of binary mergers, thereby significantly accelerating the process of precise estimation of the Hubble constant and resolving tensions in current cosmology. Perhaps most exotic of all, it may also provide a relatively foreground-free window to observe the primordial stochastic GW background generated in the very early universe.

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