

Bottom-Up Cross-Cutting Workshop “JENAS Initiative: Gravitational Wave Probes of Fundamental Physics”

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The Hubble tension: Status and Perspectives

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The success of the Λ CDM standard model of cosmology has now been established across a wide range of scales. Yet, despite this incredible success the precise nature of its ingredients has so far remained elusive. To this end, in the past decades a vast experimental effort has been undertaken to measure observables in the local and distant universe to unprecedented precision. These promising measurements have only deepened the mysteries of cosmology, however, as they revealed a growing tension between the current expansion rate of the Universe (specified by the Hubble constant) measured through the local distance ladder and that inferred from the cosmic microwave background. Now that the formal significance of this discrepancy has reached a level of five sigma significance, it is crucial to thoroughly re-examine the astrophysical observations at the heart of this Hubble tension. Similarly important is the role of looking at the future experimental efforts that are certain to bring striking new evidence that will help us to solve this cosmic puzzle.

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