

## The standard cosmological model: current status and future prospects

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Current cosmological observations are in agreement with the standard cosmological model of a homogeneous and isotropic Universe at large scales, based on General Relativity and on the standard model (SM) of particle physics, complemented with a mechanism for the generation of primordial perturbations, i.e., the inflationary paradigm. When interpreted in minimal extensions of this  $\Lambda$ CDM framework, cosmological data exhibit no evidence for departure from the base model.

Nevertheless, the great accuracy of current observations allows to reveal some discrepancies between sets of data (e.g., CMB versus low-redshift measurements) that might excitingly point to the need for a beyond- $\Lambda$ CDM paradigm. More excitingly, next-generation cosmological surveys have the potential to further investigate the robustness of these discrepancies, and in general to unveil signature of new physics hidden in cosmological probes.

In this talk, I will review the state-of-the-art of cosmological constraints on fundamental physics and prospects for future observations, highlighting the contribution of the INFN community.

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