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The value of the Hubble–Lemaître constant queried by Type Ia supernovae

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In this presentation I analyze the robustness of the value of the Hubble-Lemaître constant yielded by the cosmic distance ladder for Type Ia supernovae, which involves three rungs. In this analysis I hold fixed Rung 1 as the distance to the LMC determined to 1% using Detached Eclipsing Binary stars, in order to focus on the highest rungs. For Rung 2 I analyze two methods, the TRGB and Cepheid distances for the luminosity calibration of Type Ia supernovae in nearby galaxies. For Rung 3 I analyze various modern digital supernova samples in the Hubble flow, such as the Calán-Tololo, CfA, CSP, and Supercal datasets. This metadata analysis demonstrates that the TRGB calibration yields 5% smaller H_0 values than the Cepheid calibration, a direct consequence of the systematic difference in the distance moduli calibrated from these two methods. If Rung 1 and Rung 2 are held fixed, the different formalisms developed for standardizing the supernova peak magnitudes yield consistent results, that is, Type Ia supernovae are able to anchor Rung 3 with 2% precision.

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