

CORN - Chronometers Of Relic Nature: Estimate of the expansion rate of the Universe using compact relic galaxies

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The persistent discrepancy between the locally measured Hubble constant, derived from Cepheids and Type Ia supernovae, and the value inferred from the cosmic microwave background underscores the need for independent cosmological probes. Cosmic chronometers provide a direct, model-independent measurement of the expansion history, but their accuracy is currently limited by systematic uncertainties in stellar population modelling, particularly when the full red and quiescent population is used.

I propose an alternative chronometer strategy based on relic galaxies: the oldest, most compact, and most dynamically evolved systems at a given epoch. These galaxies are expected to host uniformly old, rapidly formed stellar populations with minimal subsequent mass growth, making them closer to ideal single-burst populations. By focusing on this population, we can reduce uncertainties associated with composite star formation histories and mitigate biases arising from late-time rejuvenation.

In this work I use the largest catalogue of relics, to construct a cleaner differential age–redshift relation. Particular emphasis will be placed on assessing the limitations of current single stellar population models, including metallicity, initial mass function, and alpha-enrichment. By quantifying how these ingredients affect absolute and differential age estimates, we aim to establish a more robust systematic floor for the chronometer method. A relic-based approach has the potential to tighten stellar age constraints at fixed redshift, refine the expansion history measurement, and provide an independent perspective on the Hubble tension.

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Clasificación de la sesión : Morning Session (Tuesday)