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Tension in Currently Measured Values of H_0

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The question of whether there is new physics beyond our current standard model, Lambda Cold Dark Matter (LCDM), is a crucial unresolved issue in cosmology today. Recent measurements of the Hubble constant (H_0) using Cepheids and Type Ia supernovae (SNe) appear to differ significantly (5-sigma) from values inferred from the cosmic microwave background (CMB) fluctuations. This discrepancy, if real, could indicate new physics beyond the standard model. In this talk, I will review results using data from the Hubble Space Telescope using Cepheids as well as the Tip of the Red Giant Branch (TRGB). A comparison of these results indicates that there remain systematic uncertainties in the local calibration of H_0 . I will describe a new program using the James Webb Space Telescope (JWST) aimed at reducing uncertainties in extragalactic distances and the measurement of H_0 , and present some new, preliminary results. JWST has four times the resolution and ten times the sensitivity of HST in the near infrared, and will be critical for ascertaining whether new physics is required beyond the standard model of cosmology.

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