

Using Carbon-rich AGB stars as Standard Candles

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I will present the J-region asymptotic giant branch (JAGB) method, a new standard candle that leverages the constant luminosities of color-selected, carbon-rich AGB stars. Using NIR imaging of 11 galaxies collected from the Magellan Telescope, we find the mode of the carbon star luminosity function in the J band is an accurate and precise method for measuring distances that are independent of distances derived from Cepheids or the tip of the red giant branch. I will discuss the advantages and current uncertainties of the JAGB method; because the JAGB method is relatively new, JAGB stars are amenable to further theoretical understanding. However, preliminary tests show little to no dependence of the JAGB magnitude on the metallicity of the parent galaxy. Finally, I will show JWST NIRCам color magnitude diagrams of SN Ia host galaxies in which the JAGB populations are resolved at high signal-to-noise, illustrating the feasibility of using JWST and the JAGB method to measure the Hubble constant this year.

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