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Sample variance in the local measurements of the Hubble constant

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The Hubble constant H0 —the expansion rate of the Universe today —has recently been measured to percent-level precision, but two of the key results are in tension. The local measurements using distance ladders have indicated H0 ˜ 73 km/s/Mpc, while the global measurements using cosmic microwave background have indicated H0 ˜ 67 km/s/Mpc. In this talk, I will first review the methods and results of both local and global measurements. I will then present our efforts of using simulations to quantify the sample variance in the local measurements of H0. Taking into account the inhomogeneous selection of type Ia supernovae, we find that this tension cannot be alleviated by sample variance or local density fluctuations. I will conclude with other possible causes of this tension.

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