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Local Distance Ladder Measurements and Determination of the Hubble Constant

WENDY FREEDMAN, University of Chicago

Our ability to measure the current expansion rate of the universe, or Hubble constant, H_0 , continues to improve with the development of new techniques, instrumentation, and both ground- and space-based telescopes. An early program of the Hubble Space Telescope (HST) was a Key Project to measure H_0 , using Cepheid variables to calibrate the extragalactic distance scale. In 2001 the Key Project resolved a factor-of-two debate, and yielded a value of $H_0 = 72 \text{ km / sec / Megaparsec}$ with a combined statistical and systematic uncertainty of 10