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“Hubble troubles”

The current expansion rate of the Universe is captured by the so-called Hubble constant, H0, which is a key parameter in the, extremely successful, standard model of cosmology. The Hubble constant relates measurements of the expansion history of the Universe to its components, and "little h" appears in all astrophysical quantities which measurement or calibration somewhat depend on the background cosmology. As such, the Hubble constant can be measured in several different ways: looking at the light of the "early Universe", looking at bright objects in the "late Universe" (an approach close to Hubble original approach) and other in-between options, each measuring the expansion of the Universe in its peculiar way. Each of these measurements is very precise: error-bars are at the percent level. However, their values do not seem to agree. These are exquisitely sophisticated, and challenging, measurements. Yet one may ask: can this be a signature that the cosmological model starts showing some cracks and that we might need to invoke new physics? The 'Hubble tension' has motivated the exploration of extensions to the standard cosmological model in the attempt to solve this tension.
The Hubble trouble, however, goes beyond H0. I will introduce this modern-day cosmic puzzle, discuss its implications, what this tension has taught us so far and possible future prospects.

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