



## Mira Variable Stars

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A new study by the **Inter-University Centre for Astronomy and Astrophysics (IUCAA)**, co-authored by **Nobel Laureate Adam Riess**, uses oxygen-rich **Mira variable stars** to measure the [Hubble constant](#) with **3.7% precision**.

### Mira Stars (Omicron Ceti)

- **About:** Mira is a **pulsating red giant star** whose brightness varies regularly, with periods ranging from **100 to 1,000 days**, due to expansion and contraction cycles in its outer layers.
  - It was the **first known variable star** (a star that doesn't shine with a constant brightness), identified in the 17th century.
  - They are **relatively cool**, with surface temperatures around **3,000 Kelvin**, and are in **the late stages of stellar evolution**.
- **Significance:** They **help measure cosmic distances** and calibrate the **extragalactic distance ladder** (a series of methods to determine distances to far-off galaxies).
  - They assist in determining the **Hubble constant** and resolving the Hubble tension (difference in the Universe's expansion rate measured from early vs. late-Universe observations) in cosmology.

### Hubble Constant ( $H_0$ )

- Formulated by Edwin Hubble in 1929, it measures the current expansion rate of the universe in **kilometers per second per megaparsec (km/s/Mpc)**, indicating how fast galaxies move apart.  $H_0$  helps estimate the **universe's size and age**.
- Edwin Hubble observed that the farther a galaxy is, the faster it moves away. This is measured using **redshift, a shift of light toward the red end of the spectrum**, indicating the universe is expanding.

**Read more:** [New Method to Determine Hubble Constant](#)

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