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A "Wonderful" Set of Mira Variables

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The conditions in Mira variable atmospheres make them wonderful laboratories to study a variety of stellar physics such as molecule+grain formation, dust production, shock chemistry, stellar winds, mass-loss, opacity driven pulsation, and shocks.

We are currently curating a Reference Set of 106 Mira variables based upon over a decade of synoptic observations made with the Palomar Testbed Interferometer (PTI). The Miras included in this dataset set include M-types, S-types, and C-types, and span a wide range of pulsation periods. PTI measured k-band angular sizes that when combined with a distance allow us to directly determine fundamental stellar parameters such as effective temperature, radial size, bolometric flux etc.

Supplementing observations with interferometric measurements of the stars opens the Mira laboratory to a wealth of different experiments. I will provide an example of combining PTI measurements with Spitzer IRS spectra of 13 M-type variables, which allowed us to fully characterize CO_2 gas in their atmospheres.

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