

Resolved stellar populations in the Rubin Era: revealing extreme mass loss and stellar explosions before they occur

Thursday, May 9, 2024 9:00 AM (30 minutes)

The Vera C. Rubin Legacy Survey of Space and Time will probe the optical time-domain with unprecedented depth, wide area, and cadence, yielding millions of transients and new scientific insight into stellar explosions, compact object physics, and cosmology. Much of the preparation for Rubin science focuses around readying existing transient surveys for the multiple order of magnitude increase in the discovery rate of optical transients. However, new challenges will arise as Rubin enables wholly new areas of discovery, including studies of the variability from the millions of resolved massive stars that will be present in Rubin survey fields, including their modes of mass loss, binary evolution, and signposts of their impending core collapse, both into black holes and luminous supernovae. I will discuss efforts to prepare for resolved massive star science in the Rubin era, including the identification of rare and extreme variables similar to the variable, heavily-extinguished red supergiant progenitor of SN2023ixf in M101, archival programs to establish catalogs of massive star populations in Hubble Space Telescope and James Webb Space Telescope imaging, and the potential to identify supernova progenitor stars through their variability on timescales of years to months before the explode.

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Session Classification: Keynote speakers