

Archival Imaging Survey of the Formation and Energy Feedback of Massive Protostars in the LMC

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Abstract

The formation of massive stars has a significant impact on the structure and evolution of the interstellar medium (ISM). After their birth, the energy feedback from the massive stars erodes the ambient medium and makes it impossible to reconstruct the physical conditions of the massive stars' natal environment; however, the energy feedback also produces conditions that lead to subsequent star formation. The "second generation" protostars, not having altered their large-scale environment, provide an excellent opportunity to link the initial interstellar conditions to the final star formation product.

Spitzer Space Telescope observations of the Large Magellanic Cloud have detected a large number of massive protostars; most of them are in HII complexes and correspond to second-generation star formation. We propose to use H-alpha and continuum images in the HST archive to examine the natal interstellar environments of massive protostars and assess whether the star formation was spontaneous or triggered. We will also search for compact HII regions and circumstellar outflow interaction features of these massive protostars, and use their geometries to constrain the model fits of the protostars' spectral energy distributions.

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