Poster: Stellar Winds and Radiation in Unison

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We present a new semi-analytic one-dimensional feedback model for isolated massive clouds ($\geq 10^5\,M_\odot$) to calculate shell dynamics and shell structure simultaneously. It allows us to scan a large range of physical parameters (gas density, star formation efficiency, metallicity) and to estimate escape fractions of ionizing radiation $f_{\mathrm{esc,i}}$, the minimum star formation efficiency ϵ_{min} required to drive an outflow, and recollapse time scales for clouds that are not destroyed by feedback. Our results show that there is no simple answer to the question of what dominates cloud dynamics, and that each feedback process significantly influences the efficiency of the others. We find that variations in natal cloud density can very easily explain differences between dense-bound and diffuse-open star clusters. As a first application of the model, we investigate the properties of the natal cloud of the massive star cluster NGC 2070 in the Large Magellanic Cloud which hosts the younger star cluster R136 at its core.

Galactic Scale