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SEMINAR

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The Effects and Importance of Feedback on High-Mass Star Formation within Massive Clusters

Abstract:

The formation of massive clusters is governed by feedback on multiple scales, from the parsec-scale destructive feedback of HII regions and supernovae to the much smaller range of possibly productive thermal feedback. I will present ALMA and JVLA observations of a high-mass star-forming region in which dozens of O-stars have already formed, yet the gas mass is still much larger than the stellar mass. The most massive protostellar 'cores' consist of surprisingly large volumes of warm (>100 K) gas, yet dense gas around other high-mass stars appears untouched by their radiation. While main-sequence high mass stars are evaporating their surrounding material, they are doing so inefficiently, suggesting that protocluster clumps form stars until they are able to exhaust their food source. Thermal feedback from accreting stars appears to be the most important process governing stellar masses in these systems, with the most massive stars regulating their own cores' formation. The dominance of thermal feedback over ionizing may be because the accreting stars remain bloated and fail to form a hot photosphere.

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