

ALMA2019: Science Results and Cross-Facility Synergies



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Early High-Mass Star Formation: A Comprehensive ALMA ATLAS

Tuesday, 15 October 2019 17:10 (25 minutes)

Invited talk

Abstract:

I will present the results from our survey of Cold Cores with ALMA (CoCoA). Star formation research has still not revealed the initial conditions for high-mass star formation (HMSF). This is largely due to the lack of clear-cut examples of dense clumps that are bound to form stars but have not done so yet (high-mass starless clumps: HMSCs). While scattered, small sky patch searches have been made, no systematic galaxy-wide survey that can place such searches on a statistical firm footing has ever been conducted. We have now performed a systematic search for HMSCs from the ATLASGAL 870 μ m survey that covers the entire inner Galactic plane which are dense and devoid of infrared sources up to 70 μ m. Embedded star formation will manifest via outflowing, shocked, and warm gas components with little or no evidence of cold gas towards dense cores. By weeding out such masqueraders, and revealing the extent of fragmentation in all HMSCs, a feat only achievable with a survey machine like ALMA, CoCoA aims to reveal the truly massive starless cores if they exist.

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Session Classification: ISM, SF