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Star formation and magnetic fields in the ALMA era

Tuesday, October 15, 2019 9:00 AM (25 minutes)

Invited talk

Abstract:
"New ALMA polarization observations continue to both expand and confound our understanding of the role played by the magnetic field in low-mass star formation. The sample of very young, Class 0 protostellar sources observed with high resolution and high sensitivity with ALMA is now large enough that we are beginning to see the same surprising features in multiple sources. The first of these are magnetic field morphologies that beautifully trace the outflow cavity walls in several objects, indicating that the outflow has shaped the magnetic field. The polarization along the cavities is strongly enhanced, and in some cases is co-located with emission from UV-tracing molecules, suggesting that the origin of the enhanced polarization is the strong irradiation of the outflow cavities. The second, more puzzling set of features are thin structures with well organized magnetic fields that are not associated with outflow cavity walls, and yet have high polarization fractions in spite of being deeply embedded and far from any obvious source of the photons necessary to align the grains. These results challenge our understanding of both magnetic grain-alignment and grain growth in the earliest stages of star formation."

Presenter: Dr HULL, Chat

Session Classification: ISM, SF