BOSTON UNIVERSITY

ASTROPHYSICS SEMINAR SERIES

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CfA

"How to Make Massive Stars"

Monday, March 03, 2014
Refreshments at 3:15pm in CAS 500
Talk begins at 3:30pm in CAS 502

Abstract:
Massive stars dominate the appearance and the evolution of galaxies. Despite their prominence, their formation is not well understood. In the Milky Way, most young massive stars are found in parsec-scale molecular clumps. Their birth is linked to the collapse and fragmentation of massive molecular clumps and clustered star formation. It appears that massive star formation is about fighting against the odds every step in the way. The physical conditions (temperature and density) in a molecular clump limit the Jeans mass to about 1 Msun. This creates the first barrier for massive star formation since dense cores much larger than 1 Msun tend to further fragment into lower mass cores. Once protostars reach 8 Msun, the radiation pressure may halt the infall and prohibit stars from further mass growth. In this talk, I will review recent studies that help overcome these barriers. I will present studies of massive infrared dark clouds that reveal fragmentation towards the beginning phase of a cluster formation. I will then present studies of accretion flows surrounding high mass protostellar objects. Finally, I will present measurements of dust polarization in massive molecular clumps, which suggest that magnetic fields play an important role during the collapse of molecular clumps and the formation of dense cores.