Instituto de Astronomía
Universidad Nacional Autónoma de México
Sede Ensenada, Baja California, México

Seminario de Investigación

Miércoles, 25 de Julio de 2012
11:00 hrs, Auditorio IA-Ensenada

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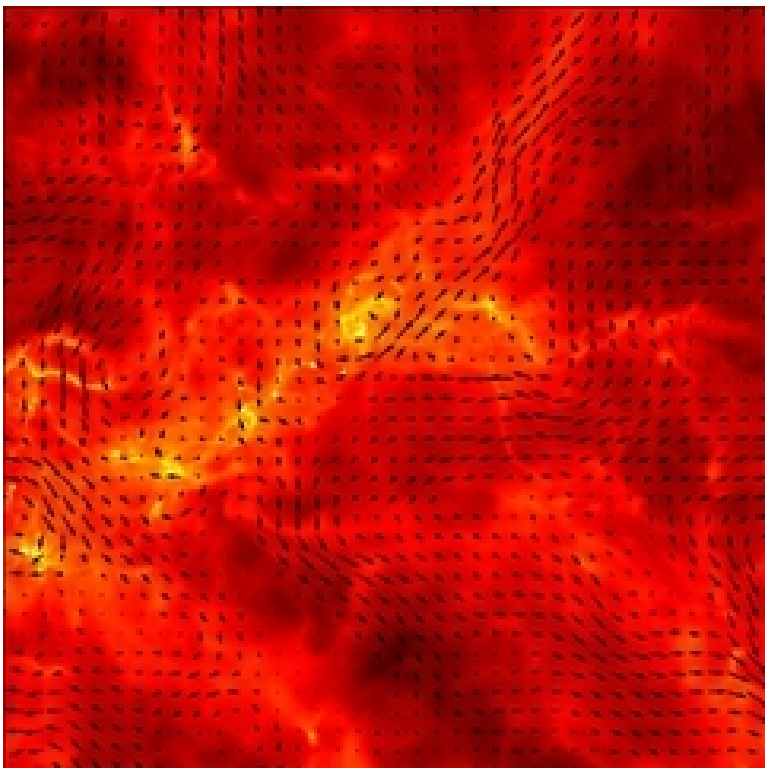
"STAR-FORMING CLOUDS WITH SELFGRAVITY AND MAGNETIC FIELDS."



We examine the effects of self-gravity and magnetic fields on supersonic turbulence in isothermal molecular clouds with high-resolution simulations and adaptive mesh refinement. We find that gravity splits the clouds into two populations, one low-density turbulent state and one high-density collapsing state. The low-density state exhibits properties similar to non-self-gravitating in this regime, and we examine the effects of varied magnetic field strength on statistical properties. The high-density state is well characterized by self-similar spheres. The high Alfvn Mach numbers in collapsing regions explain the recent observations of magnetic influence decreasing with density. We also find that the high-density state is typically found in filaments formed by converging flows, consistent with recent Herschel observations. Possible modifications to existing star formation theories are explored. The overall trans-Alfvnic nature of star-forming clouds is discussed.