

NRAO/Socorro Colloquium Series**James DiFrancesco***NRC*

Filaments in Star-forming Molecular Clouds**Abstract:**

Recent submillimeter surveys of nearby molecular clouds by the Herschel Space Observatory have revealed that such clouds are rife with filamentary structures. These filaments may be the efficient means for mass to assemble within clouds to form compact dense cores, the precursors of star formations. Indeed, cores and the youngest protostellar objects appear to coincide with filaments with linear masses higher than $\sim 16 M_{\text{sun}}/\text{pc}$, the critical threshold for fragmentation of an isothermal cylinder at 10 K. Filaments may be also the source of the slope at the high-mass end of the clump mass function, which is similar to the Salpeter slope of the IMF at higher masses. Furthermore, the intersections of filaments may provide multiple avenues of mass growth in a compact area, giving locally high densities that promote high-mass star formation and associated clusters. We describe also the progress in exploiting the rich Herschel data of nearby star-forming molecular clouds, including the release of the first catalogues, and new attempts to constrain the dynamics of filaments through large-area NH_3 mapping of nearby clouds with the Green Bank Telescope.

May 8, 2015**11:00 am****Array Operations Center Auditorium****All NRAO employees are invited to attend via video, available in Charlottesville Auditorium, Green Bank Auditorium, and VLA Video Conference Room.**Local Host: Claire Chandler
