

Connecting comets to the pre-solar cloud
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Comets are considered to be relatively pristine material left over from the formation of the solar system; hence, the study of their composition gives us unique insight into the chemical makeup of the natal protoplanetary disk from which the planets formed. Rosetta's visit to comet 67P/C-G has revealed the complex nature of the volatile icy material in this comet. At the same time, remote sensing observations of nearby low-mass protostars and protoplanetary disks are tantalisingly showing a similar chemical makeup in these objects. Questions then arise from these complementary sets of observations. Do these results point towards a universality of chemical processes throughout all astrophysical environments? Or does cometary material have an interstellar or protostellar origin?

In this talk I will review recent results from high sensitivity observations of low-mass protostars and protoplanetary disks that have revealed their cometary-like composition. I will describe the processes that give rise to chemical complexity in volatile material in astrophysical environments and how astrochemical models can be used to test hypotheses on the provenance of comets.