Interpreting the results of large, multi-molecular-line datasets of the molecular ISM

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In the last decade, the development of wide-bandwidth receivers and fast wide-field mapping has let to the collection of far more data then can possibly be processed and analysed manually. In this presentation we describe how automated data processing techniques, such as principal component analysis, filament finding algorithms and probability density function analysis can be used to interpret these large multi-line datasets. We discuss how these techniques have been used to analyse the G333 and Vela C molecular clouds, and determine which molecules respectively trace the turbulent and gravitationally bound components of the interstellar medium. We also show how the comparison of subsets of molecules, for example CS, N_2H^+, HCO^+ and C_2H can be used to highlight star forming regions at different stages of development in these large datasets.