



Appunti di Fisica '20 & Dottorato di Ricerca in Fisica

19 febbraio ore 15:00
Sala seminari, CNR-IPCF

Laboratory Studies of Organic Chemistry in Space: a path towards prebiotic chemistry

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A large inventory of molecules have been discovered in interstellar and circumstellar environments, the majority of them being complex organic molecules. While small species detected in molecular clouds are often exotic unsaturated radicals, organic molecules are largely partly hydrogen-species, i.e. structures containing three or more H-atoms with no C-C multiple bonds. Many of these molecules are also of biological interest. The identification of a relevant number of organic molecules in interstellar spectra has suggested a possible connection between interstellar chemistry and the origin of life.

However, the mechanisms by which complex organics in space are formed remains largely unknown. Gas-phase reactions, i.e. ion-molecule and atom-radical reactions, can produce molecules up to intermediate complexity. Icy mantles around dust grains offer a solid surfaces where the local high density can enable different routes through which complex species can be formed. The synthesis of complex organics on grain surfaces can be accelerated by thermal processes, radiation, and cosmic rays particles.

Laboratory irradiation of interstellar ice analogues has highly contributed to understand the molecular complexity in space. In this talk I will give an overview of recent achievements in laboratory astrochemistry.

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