Title: Astrochemistry: Understanding Our Chemical Cosmos

Kinsuk Acharyya

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Molecules are found in a wide variety of astronomical conditions, ranging from star-forming regions to the outer envelopes of carbon stars and from objects in our solar system to distant metal-poor galaxies. The complexity of these molecules ranges from simple diatomic molecules to amino acids such as glycine. Their association with various phases of star and planet formation are of particular interest; they can serve as building blocks of more complex molecules and provide an insight into the primordial composition of our planet Earth, thereby addressing the issue of "how life originated on Earth". Besides, they are useful probes of the physical conditions of their environment and are related to the lifetime of the sources. Many molecules not found in terrestrial conditions are of interest for what they tell about the build-up of molecular complexity throughout the Universe. Therefore, the study of the formation of these molecules is of paramount importance. In this talk, I will discuss how the formation of these molecules can be studied using numerical simulations in diverse astrophysical sources, emphasising star-forming regions, comets, and exoplanets.