

From Interstellar Ices to Polycyclic Aromatic Hydrocarbons

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The role of Cosmic Fullerenes

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In recent years, the buckminsterfullerene C₆₀ has been detected in a variety of astrophysical environments – from the circumstellar carbon-rich surroundings of evolved stars [e.g. 1,2,3] to interstellar reflection nebulae [e.g. 4] and young stellar objects [5; see 6 for an overview]. Understanding how these species form, evolve and respond to their environment yields important insights into the characteristics of carbonaceous macromolecules and dust – the main reservoir of organic material in space.

Here, I will present an overview of what we have learned about cosmic fullerenes from astronomical observations, theoretical calculations [e.g. 7] and laboratory experiments [e.g. 8], with an emphasis on the conditions that are conducive to the formation and/or detection of fullerenes in evolved star environments. I will discuss their relation to other species such as polycyclic aromatic hydrocarbon molecules (PAHs), hydrogenated amorphous carbon grains and other dust components. I will comment on their role in the Diffuse Interstellar Bands (DIBs) problem [see 6].

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