

Infrared Emission From Interstellar PAHs, New Probes of the Interstellar Medium

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Tremendous strides have been made in our understanding of interstellar material over the past twenty years thanks to significant, parallel developments in two closely related areas: observational astronomy and laboratory astrophysics. Twenty years ago the composition of interstellar dust was largely guessed at and the notion of abundant, gas phase, polycyclic aromatic hydrocarbons (PAHs) anywhere in the interstellar medium (ISM) considered impossible. Today the dust composition of the diffuse and dense ISM is reasonably well constrained and the spectroscopic case for interstellar PAHs, impossibly large molecules by early interstellar chemistry standards, is very strong. PAH spectral features are now being used as new probes of the ISM.

This paper, while briefly summarizing the history and development of the interstellar PAH model, will focus on recent uses of the NASA Ames PAH IR spectral Database to interpret astronomical observations and in theoretical development. Examples will be given showing how changes in interstellar PAH characteristics such as structure, size and composition determine the spectral characteristics of different objects as well as provide insight into the nature of the emission zones.