

From Interstellar Ices to PAHs

A symposium to honor Lou Allamandola's Contributions to the Molecular Universe
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INVITED TALK

The PAH universe

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The infrared (IR) spectra of objects associated with dust and gas – including evolved stars, reflection nebulae, the interstellar medium (ISM), star-forming regions, and galaxies out to redshifts of $z \sim 4$ – are dominated by emission bands at 3.3, 6.2, 7.7, 8.6 and 11.2 μm , the so-called unidentified infrared (UIR) bands. They are generally attributed to the IR fluorescence of Polycyclic Aromatic Hydrocarbon molecules (PAHs) UV pumped by nearby massive stars (Allamandola et al. 1989, Puget & Léger 1989). Hence, the UIR band strengths are used to determine the star formation rate in galaxies, one of the key indicators for understanding galaxy formation and evolution. To date, PAHs are among the largest and most complex molecules known in space. They emit 20-30% of the galactic IR radiation and 10-20% of the cosmic carbon is locked up in PAHs.

In this talk, I will give an overview of the advances in observational and theoretical studies of PAHs, and highlight Lou Allamandola's contributions to the field.

REFERENCES

Allamandola L.J., Tielens A.G.G.M., Barker J.R. (1989), ApJS 71, 733

Puget J.L., Léger A. (1989), ARAA, 27, 161