# Carbonaceous Nanoparticles in the ISM?

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Although the Polycyclic Aromatic Hydrocarbon (PAH) hypothesis remains the most widely assumed explanation for the interstellar infrared emission bands at 3.3, 3.4, 6.2, 7.7, 8.6, 11.3, and 12.7 $\mu m$, it is not universally accepted. Laboratory analogs, such as hydrogenated amorphous carbon and soot, offer a compelling alternative explanation because their infrared absorption features align closely with observed interstellar emission bands. These laboratory analogs are insensitive to the way they are produced, for example by condensation of a hydrocarbon plasma, laser ablation of graphite, or combustion. However, the precise composition of the carrier remains elusive due to differences between laboratory and astronomical spectra and the lack of a robust model to explain stochastic emission from solid state carbonaceous nanoparticles.

As a side topic, we will discuss why the spectral energy distribution (SED) should be plotted as $\log(\lambda F_\lambda)$ versus $\log(\lambda)$ [or $\log(\nu F_\nu)$ versus $\log(\lambda)$] instead of $\log(F_\nu)$ versus $\log(\lambda)$. This will improve our understanding of the spectral energy distribution of astronomical objects and the nature of the carrier.