Spectroscopy of interstellar carbonaceous dust

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Outline

- Introduction: Hydrogen, carbon and dust
- Spectral features of large carbon structures
 - IR emissions: PAHs?
 - IR absorptions: a-C:H
- Interstellar dust evolution

Conclusions

- Facts
 - C/H large molecules and solids ubiquitous in the ISM (**IR spectroscopy**)
 - Absorption features dominated by aliphatic (3.4 μ band) transitions
 - Emission features dominated by aromatic transitions
- Pending issues
 - Carbon budget vs dust models
 - Balance between dust production and destruction
 - Nature of band carriers: size, H/C ratio, aliphatic/aromatic proportion
 - Mechanisms of dust formation in AGB stars
 - Absence of 3.4 μ m band in dense clouds
- Further work
 - New observations
 - Experiments: spectroscopy + solid state structure determination
 - Calculations of structures and spectra
 - Chemical modelling
 - **Especially interesting: Transition between diffuse and dense clouds**