PAH CHARGE STATE DISTRIBUTION AND DIB CARRIERS:
IMPLICATIONS FROM THE TRANSLUCENT LINE OF SIGHT TOWARD HD147889 [a]

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We will present our work involving the modelling of the polycyclic aromatic hydrocarbon (PAH) charge state distribution throughout diffuse/translucent clouds and the link with the unidentified diffuse interstellar bands (DIBs). As a first test case we decided to do a detailed analysis of the ubiquitously observed translucent cloud in the line of sight towards the early type star HD147889, which is situated near the ρ Ophiuchus cloud.
First we solved the thermal and chemical balance of this cloud, with constraints given by the observed atomic and molecular column densities. The resulting hydrogen density, incident radiation field and electron and temperature structure of the cloud subsequently determined the charge balance for the selected species. We included 70 different PAHs, belonging to five point/symmetry groups, and containing 6 to 48 carbon atoms.
Together with the calculated transition wavelengths, oscillator strengths and assumed size distribution the charge state distribution can be converted to a theoretical PAH absorption spectrum for the modelled line of sight. The result can then be compared, with caution, to the spectra of the observed diffuse interstellar bands in the line of sight. Several predictions and limits on the properties of PAHs in the interstellar medium will be discussed.

[a] Ruiterkamp et al., 2005, Astronomy & Astrophysics, In press