# DOES THE STRUCTURE OF THE POLYCYCLIC AROMATIC HYDROCARBON IMPACT THE AGGREGATION OF WATER ON ITS SURFACE? FLUORENE VS ACENAPHTHENE

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As polycyclic aromatic hydrocarbons (PAHs) are of interest to many communities, including astronomers, it is important to understand the interactions that they may be a part of. As water is ubiquitous in astronomical environments and PAHs are thought to form ice grains, the PAH-water interactions are of specific interest. In this investigation we used chirped pulse Fourier transform microwave (CP-FTMW) spectroscopy from 2-8 GHz to study the fluorene monomer and its complexes with water. While the monomer has previously been studied [1], our use of the COMPACT [2] instrument allowed us to observe not only new transitions for the monomer but also transitions for $^{13}$C species. This allowed for a structural analysis of the monomer to be presented. This structural information is important when we move to complexes of PAHs with compounds such as water. We have previously studied the interactions of up to four water molecules clustered with the PAH acenaphthene (Ace)[3]. As in the Ace-water study, we have observed up to three water molecules complexed with fluorene and obtained isotopic data for the complexes. In this talk we will present these findings and the structural differences between the two PAH-water systems.

[1] Thorwirth, S., Theulé, P., Gottlieb, C.A., McCarthy, M.C., Thaddeus, P. *Astrophys. J.*, 662, 1309-1314, **2007**.

[2] Schmitz, D., Shubert, V.A., Betz, T., Schnell, M. *J. Mol. Spectro.*, 280, 77-84, **2012**.

[3] Steber, A.L., Pérez, C., Temelso, B., Shields, G.C., Rijs, A.M., Pate, B.H., Kisiel, Z., Schnell, M. *J. Phys. Chem. Lett.*, 8, 5744–5750, **2017**.