

EINLADUNG

zum Vortrag von

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über

The Iceberg Model: a 2D IR Spectroscopic Inquest

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Abstract:

The enigma of the hydrophobic force has for decades captured the imagination of scientists. The seventy years old idea by Frank and Evans that the hydrophobic effect was mainly due to some kind of "iceberg" formation around a hydrophobic solute stimulated countless experiments and molecular dynamics simulations. This is not surprising because a better understanding of hydrophobic interactions is extremely important as hydrophobic effects determine to a large extent protein structural dynamics and functioning in their natural environment.

Here we present results of ultrafast two-dimensional infrared spectroscopy experiments on the OH-stretch vibrational mode of water molecules near hydrophobic groups. Our experiments demonstrate that the hydrophobic groups induce a dramatic slowing down of the hydrogen-bond dynamics of the solvating water molecules. This change in dynamics perfectly correlates with a considerable decrease of the orientational mobility of the water molecules. Our findings suggest the hydrogen-bond network around hydrophobic groups is not more rigid as compared to the bulk, but that the hydrogen bond dynamics in the two cases are very different.

