

GRK 2516 Soft Matter Seminar

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None

Research seminar of the DFG Research Training Group GRK 2516 (<https://grk2516.uni-mainz.de>).

Katrin Amann-Winkel
JGU, Physics

Does Water consist of two liquids? How X-rays can help to reveal this question.

Water is the most important liquid for life on earth. However, many properties of water are most anomalous, such as the density maximum at 4°C or the divergence of the heat capacity upon cooling. Although the water molecule is seemingly simple, the hydrogen-bonded network keeping these molecules together and determining the many anomalous macroscopic properties of water, is still a puzzle. Computer-simulations suggest, that the anomalous behaviour of ambient and supercooled water could be explained by a two state model of water. The hypothetical existence of two distinct liquid states, namely high- and low-density liquid (HDL, LDL), is considered controversial. An important role in this ongoing debate plays the amorphous solid states of water. Since the discovery of two distinct amorphous ices with different density (high- and low density amorphous ice, HDA and LDA) it has been discussed whether and how this phenomenon of polyamorphism at high pressures and low temperatures is connected to the occurrence of two distinct liquid phases (HDL and LDL). X-ray scattering experiments on both supercooled water and amorphous ice are of major importance for our understanding of water. In my talk I will give an overview on our recent experimental findings on amorphous ice and supercooled water.