

**25<sup>th</sup> August 2015 - 14:00 h**  
CFEL – Building 99, seminar room I (ground floor)

**Ruth Livingstone**

Max Planck Institute for Polymer Research, Mainz, Germany

## Ultrafast dynamics of water at charged surfactant interfaces

Interfacial water molecules play a large role in, amongst other things, biological systems, the climate, energy production, and catalysis. The disruption of the hydrogen bonding network at the interface leads to high surface tension; surfactants reduce that surface tension by forming a monolayer at that interface. The dynamics of water in contact with both positively and negatively charged surfactant monolayers was measured using surface-specific 2-dimensional sum frequency generation vibrational spectroscopy with femtosecond time resolution. The time-dependent frequency fluctuations of the O-H stretch vibration report back on the dynamics of the water hydrogen-bonded network. Rapid energy transfer is observed in all cases. For the negatively charged interface we see clear crosspeaks that not present at the positively charged and neutral interfaces. These can be attributed to two distinct sub-ensembles of water at the interface. We conclude that the charge of the surfactant monolayer radically changes the behavior of the interfacial water.

