

## Einladung zu einem Kolloquium

Datum/Zeit: **Dienstag, 19.03.2024, 16.45 Uhr**

Referent: **Prof. Sylvie Roke**  
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Titel: *Aqueous Nanoscale Systems*

Ort: **HCI J3**

Water is the most important liquid for life. It is intimately linked to our well-being. Without water, cell membranes cannot function. Charges and charged groups cannot be dissolved, self-assembly cannot occur, and proteins cannot fold. Apart from the intimate link with life, water also shapes the earth and our climate. Our landscape is formed by slow eroding/dissolving processes of rocks in river and sea water; aerosols and rain drops provide a means of transport of water. Because of the complexity of liquid water and aqueous interfaces, the relationship between the unique properties of water and its molecular structure has not been solved.

Techniques that can provide femtosecond structural information over multiple length scales can help. For this purpose, we developed nonlinear light scattering [1] and imaging tools [2] to access molecular structural information of aqueous solutions and interfaces. With our new approaches we have found nanoscale ordering in dilute salt solutions [3], and probed the structure of aqueous nanoscale interfaces relevant for chemistry and biology: emulsions [4], lipid droplets [5], liposomes [6], water droplets [7] and oxides [8]. We solved the mysteries behind the Jones-Ray effect [3] and the origin of charge on neutral oil droplets in water, which underlies hydrophobicity [9]. The optical properties of water can also be used to determine the electrical potential (voltage) of interfaces. This unique spatiotemporally resolved hydration readout is useful for chemistry [2], biophysics [10], neurology [11] and catalysis [12].

### References

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**Gäste sind willkommen**