

# Seminar

## **Dr. Clemens K. Weiss**

*weiss@mpip-mainz.mpg.de*

Max-Planck-Institute for Polymer Research, Ackermannweg 10, 55128  
Mainz, Germany

### **Self-assembly of colloids at the air/water interface - towards complex colloidal monolayers**

Self-assembled colloidal monolayers are the foundation of what is referred to as “easy nanotechnology” – precise nanoscale structuring and patterning of surfaces without expensive equipment for a multitude of applications, ranging from plasmonics to catalysis. Adding functionality to the colloids and increasing the complexity beyond the hexagonal arrangement, typically obtained in a self-assembly process, will open a huge variety of possibilities for exploiting the whole potential of colloidal monolayers.

Here, recent results on the preparation of monolayers from functional colloids and their use for conventional and non-conventional lithographic processes are presented. For patterning large substrates with arbitrary topography the pre-assembly of colloids at the air/water interface and the subsequent deposition on the desired substrate is the method of choice. The successful assembly at the interface, however, requires thorough investigation of the behavior of the colloids at the interface. In addition to the evaluation of pressure-area isotherms, the visualization of colloids at the interface by embedding them in a polymeric film can be used for the determination of properties as the interfacial fraction of the colloids and the contact angle of individual colloids. With this knowledge at hand, high quality, large scale monolayers of single sized colloids as well as binary monolayers, consisting of a stoichiometric mixture of small and large colloids, were prepared and used for lithographic processes.

**Wednesday, November 23, 14h15**

**Hörsaal Makromolekulare Chemie, Stefan-Meier-Str. 31**

Contact: Barbara Heck, IRTG Soft Matter Science  
Tel +49 761 203 97778 Email [softmattergraduate@uni-freiburg.de](mailto:softmattergraduate@uni-freiburg.de)