For fabrication of stimuli responsive coatings one of the challenges is to generate stable films which are still mobile and sensitive to outer parameters. The talk will focus on two types of thin polymer films at solid interfaces: polyelectrolyte multilayers which are built up by alternating deposition of polyanions and polycations from aqueous solutions [1, 2] and films formed by deposition of hydrogel microparticles [3]. FRAP measurements show that the mobility of the polyelectrolyte chain within the polyelectrolyte multilayers can be easily changed by e.g. the degree of polymer charge, ionic strength and type salt [4]. The water content was studied by neutron reflectometry. The temperature effects are minor due to strong interdigitation between adjacent polyelectrolyte layers [5]. Therefore another strategy is to separate thermosensitive compartments from stabilizing ones.

During the last decades microgels made of N-isopropylacrylamide (NIPAM) have attracted much interest and were studied by several techniques like microscopy and light scattering. These polymer particles show thermoresponsive behaviour and can therefore be classified as “smart” materials.
By copolymerisation with organic acids such as acrylic acid (AAc) the temperature of the volume phase transition as well as the swelling ratio can be influenced. Moreover charged copolymers are sensitive to changes in pH and ionic strength. Depending on the way of preparation one can achieve particles with rather low polydispersity which makes them more interesting for applications like surface coatings and sensor design. Our work focuses on the fabrication of stimuli responsive films and on the effect of geometrical confinement on the phase volume transition of these microgel particles [3, 6]. The effect of cross-linker and co-monomers on the swelling behaviour and on the elasticity is presented [7].

References:

**Universitätshauptgebäude, Hörsaal 3,**

**Donnerstag, den 20. Januar 2011 um 17 Uhr c.t**

gez. Prof. Dr. Thomas Koop, Prof. Dr. Jochen Mattay, Prof. Norbert Sewald