Hybrid Soft Matter
Concepts for property manipulation by means of external fields

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The development of defined organic-inorganic hybrid materials and nanocomposites is an important area of today´s material research. Next to their classical function as fillers, inorganic nanoparticles are capable to take over additional tasks, e. g. the interaction with electromagnetic fields. We are concerned with the combination of polymers and gels with magnetic and metal nanoobjects from a fundamental and applied point of view. By the creation of a well-defined interface between particles and matrix in polymer brush particles and microgels, a highly disperse particle distribution in polymers and solvents can be achieved.

The talk will give an overview on our recent works on the synthesis of hybrid structures from functional polymers and dipolar nanoparticles, and their manipulation with external fields on various length scales. The systems are ranging from shape-changing and actuating materials to reversible Pickering emulsions and core-shell nanotransporters.