Vortragsankündigung

Mittwoch, 24. Jänner 2018, 17:00 s.t.

Seminarraum I (JAK2AOG1.33), Jakob-Haringer-Straße 2a

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Bridging Length Scales: From Nanoparticles to Materials

Nanoparticles offer a broad range of size- and shape-dependent properties and are thus the ideal building blocks for the bottom-up fabrication of functional materials. However, to produce macroscopically sized materials with defined architectures, it is critical to have full control over the assembly of the building blocks including their spatial arrangement, orientation and their interaction from the nano- to the macroscale, thus bridging several orders of length scales. The talk will cover the synthesis of various types of nanoparticles, mainly metal oxides, with different sizes and shapes by nonaqueous sol-gel chemistry. Different strategies will be presented, how nanoparticles, nanowires or nanosheets can be assembled and processed into 2- and 3-dimensional geometries, including films and aerogels. A major effort is directed towards achieving monolithic bodies with macroscopic size, however without losing the nanoscale properties of the initial building blocks. Co-assembly of different types of nanoparticles enables subtle tuning of the properties of the final materials, optimizing them for specific applications in gas sensing, photocatalysis or in energy storage.