

# Functional Nanoparticles and Nanowires: Synthesis and Device Integration

Sanjay Mathur

*Inorganic and Materials Chemistry, Institute of Inorganic Chemistry, University of Cologne,  
Greinstrasse 6, 50939 Cologne, GERMANY  
sanjay.mathur@uni-koeln.de*

## Abstract:

Inorganic nanostructures inherit promises for substantial improvements in materials engineering mainly due to improved physical and mechanical properties resulting from the reduction of microstructural features by two to three orders of magnitude, when compared to current engineering materials. This talk will present how chemically grown nanoparticles, nanowires and nanocomposites of different metal oxides open up new vistas of material properties, which can be transformed into advanced material technologies. The examples will include molecule-based synthesis of nanostructured materials and development of singlenanowire based devices. The successful synthesis, modification and assembly of nanobuilding units such as nanocrystals and wires and – tubes of different materials have demonstrated the importance of chemical influence in materials synthesis, and have generated great expectations for the future.