Area A

Symposium A3

Nanowires and Nanotubes: From Growth Phenomena to Devices		
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Abstract

1D nanostructures such as nanowires and nanotubes are promising building blocks for many existing and emerging applications. Different strategies for their synthesis have been demonstrated while metal supported bottom-up growth methodologies dominating literature reports. In recent years, significant progress has been made in controlling the morphology, structure, and composition of these 1-D nanostructures and their heterostructures. Consequently, the progress in tailoring and controlling growth processes enabled the fabrication of prototype devices and composite materials while exploiting the inherent electronic, optoelectronic, electrochemical, and/or thermal properties of the 1D nanostructure. While some composite and hybrid materials based on nanotubes have gained market maturity, commercial use of 1-D nanostructures is hampered by reams of materials and device challenges. To brake existing barriers, creative solutions are required to implement these exiting 1D materials in functional super-/heterostructures, to prepare new materials and to control interfaces.

This symposium will showcase recent progress in the field and illustrate opportunities to advance the state-of-the-art. Innovative new interdisciplinary research directions with contributions from a wide field of disciplines including materials science, chemistry, physics, biology and engineering shall be highlighted. This wide field of researchers with interests in different facets of 1D nanomaterials research will provide an excellent environment for developing new ideas for transformative research in this area.

The following topics are of particular interest:

(i) New insights to nucleation and growth of 1D nanostructures influencing phase, composition or properties by *in situ* analyses; (ii) syntheses strategies enabling new materials compositions or geometries; (iii) methods for a direct fabrication of interconnects between individual 1D nanostructures or interconnected networks; (iv) methods that improve throughput and purity of

homogeneous and heterogeneous 1D nanostructures; (v) controlling interfaces and materials properties in composite materials containing nanowires or nanotubes. (vi) understanding of material properties and device performance in emerging applications including nano-bio-interactions, transport behaviour, batteries etc. In general, any area of materials research where 1D nanostructures or materials thereof (e.g. hybrid materials or composites) are expected to outperform current state-of-the-art materials.