

# MRS SYMPOSIUM PROCEEDINGS

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## Micro- and Nanoscale Systems – Novel Materials, Structures and Devices

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# **Micro- and Nanoscale Systems – Novel Materials, Structures and Devices**

**MATERIALS RESEARCH SOCIETY  
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**Micro- and Nanoscale Systems – Novel  
Materials, Structures and Devices**

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## PREFACE

Symposium XX, “Microelectromechanical Systems – Materials and Devices,” held from December 2 to December 4, 2013 at the MRS Fall Meeting, explored the fabrication, integration, characterization, and application of small-scale electro-mechanical, thermal, magnetic, fluidic, and optical sensors and actuators. The scope of this multidisciplinary symposium emphasized efforts ranging from fundamental research to implementation in industry and was chaired by Chris Keimel (GE Global Research), Helena Silva (University of Connecticut), Robert Candler (University of California, Los Angeles), and Frank DelRio (National Institute of Standards and Technology). Eleven papers from the symposium are included in this proceedings volume. Of these, three explore new micro- and nanoscale devices, five are devoted to material and process integration, and three look to address various aspects of material and device reliability. Thus, the volume focuses on both newer materials in the development and integration stages and traditional materials in the device optimization and reliability stages. Furthermore, it is worthwhile to note the continued success of MEMS and NEMS in biological and chemical sensors (two papers) and microfluidics (two papers), as these devices are critical for biomedical applications. This volume represents the sixth installment in a series of proceedings by MRS on this topic; the first five volumes were published as Volumes 1052, 1139, 1222, 1299, and 1415.

Symposium SS, “Nanowires and Nanotubes – Novel Materials, Advanced Heterostructures, Doping and Devices,” was held from December 1 to December 6, 2013 at the MRS Fall Meeting, and explored not only the synthesis and properties of bare nanowires and nanotubes of one material, but also more sophisticated structures such as inorganic/organic core/shell nanowires. The symposium attracted speakers and attendees from industry as well as academia and was chaired by Tobias Voss (University of Bremen), Anna Fontcuberta i Morral (EPFL), Qihua Xiong (Nanyang Technological University), John Boeckl (Air Force Research Laboratory), and Chennupati Jagadish (Australian National University). The twenty-one sessions covered a wide range of topics, including plasmonics and photonics, next generation photovoltaics, nanowire-based thermoelectric applications, and electronic transport and devices, and well as facilitated a rich poster session. The diversity is reflected in this conference proceedings volume, which encompasses twenty three papers in total. Among others, it contains several papers on the growth and characterization of Si, ZnO, Ge, TiO<sub>2</sub>, MnO<sub>2</sub>, and InP nanowires and carbon nanotubes, in addition to several papers on their electronic and optical properties.

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