

# **Oxide Nanoelectronics**

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# **Oxide Nanoelectronics**

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## PREFACE

Symposium K, “Oxide Nanoelectronics,” was held Nov. 29–Dec. 3 at the 2010 MRS Fall Meeting in Boston, Massachusetts. The emerging field of oxide nanoelectronics has grown tremendously in the last decade. Many striking empirical observations in a variety of oxide materials show great promise for ultrahigh-density storage, passive and active nanodevice creation, and functionality based on multiple properties (e.g., magnetic and ferroelectric). The prospect for band-device engineering in oxide heterostructures is comparable to what took place for III-V semiconductors roughly 30 years ago.

The symposium that this volume is based on brought together researchers working in this new field to lay a materials-based foundation that can pave the way for major industrial use of these high-performance nanoelectronic systems. The presented topics included: the growth of new oxide materials and heterostructures using pulsed-laser deposition and molecular beam epitaxy; integration of oxides with silicon substrates; characterization of novel electronic and correlated-electron properties in oxide thin films and superlattices; nanoscale control of phase transitions and correlated properties; theory of oxide nanostructures; mixed ion-electronic conduction; magnetism; and oxide 2DEGs. The proceedings are divided into five sections that best reflect the content and orientation of the original contributions.

The symposium organizers would like to acknowledge financial support by Hewlett-Packard and Kurt J. Lesker Company.

Harold Hwang  
Jeremy Levy  
Peter Maksymovych  
Gilberto Medeiros-Ribeiro  
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March 2011



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