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978-1-605-11331-9 — Ion Beams - New Applications from Mesoscale to Nanoscale

Edited by John Baglin , Daryush Ila , Giovanni Marletta , Ahmet Öztarhan

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**MATERIALS RESEARCH SOCIETY  
SYMPOSIUM PROCEEDINGS VOLUME 1354**

# **Ion Beams — New Applications from Mesoscale to Nanoscale**

Symposium held April 25–29, 2011, San Francisco, California, U.S.A.

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## PREFACE

Symposium II, "Ion Beams — New Applications from Mesoscale to Nanoscale" was held at the 2011 MRS Spring Meeting, April 25-29, 2011 in San Francisco, California.

This symposium welcomed presentations on ion-beam engineering and characterization of materials properties, structure, topography, or functionality, spanning dimensions from the mesoscale to the nanoscale. Indeed, while the unique capabilities of ion-beam techniques in the diverse emerging fields of nanoscience and nanotechnology are fast becoming critical for many new applications, the flexibility of ion-beam techniques now enables the development of new tools that can integrate tailoring of nanoscale patterns and structures with unique in-situ imaging and analysis – as indicated by the wealth of research reports presented in this volume. The recent evolution of such instrumentation has energized new programs, both basic and applied, in fast-developing areas ranging over advanced semiconductor integration, information storage, sensors, plasmonics, molecular engineering, biomaterials, and many aspects of the development of alternative energy resources.

In a field displaying such rapid evolution on many fronts, it is appropriate for us to pause occasionally and review the overall state of the field, and its emerging opportunities and challenges. Two special Forum sessions, late in the Symposium, (titled "Ion Beam Institute"), were held to facilitate such consideration. They yielded lively discussion and remarkable consensus of opinion about the direction and priorities of the field for the future. These sessions are summarized in detail in the concluding paper of this volume. That report displays a dynamic state of the field, especially with respect to interdisciplinary applications, and notably for the bio sciences, where ion beam techniques have much to offer in new emerging basic research and applications.

The organizers would like to take this opportunity to thank the sponsors of this Symposium, (NASA and National Electrostatics Corporation) for their generous financial support.

John Baglin  
Daryush Ila  
Giovanni Marletta  
Ahmet Öztarhan

September 2011

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