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Research Society Symposium Proceedings: Volume 1049

Editors: Eric Le Bourhis, Dylan J. Morris, Michelle L. Oyen, Ruth Schwaiger and Thorsten Staedler

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**MATERIALS RESEARCH SOCIETY
SYMPOSIUM PROCEEDINGS VOLUME 1049**

Fundamentals of Nanoindentation and Nanotribology IV

Symposium held November 26–29, 2007, Boston, Massachusetts, U.S.A.

EDITORS:

Eric Le Bourhis

Université de Poitiers
Futuroscope-chasseneuil, France

Dylan J. Morris

National Institute of Standards and Technology
Gaithersburg, Maryland, U.S.A.

Michelle L. Oyen

Cambridge University
Cambridge, United Kingdom

Ruth Schwaiger

Forschungszentrum Karlsruhe
Karlsruhe, Germany

Thorsten Staedler

Universitaet Siegen
Siegen, Germany



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PREFACE

Symposium AA, “Fundamentals of Nanoindentation and Nanotribology IV,” was held November 26–29 at the 2007 MRS Fall Meeting in Boston, Massachusetts. This symposium was the fourth of a series highlighting emerging topics in nanoindentation and nanotribology, including the development of new methods for characterizing nanoscale mechanical and tribological properties.

Nanoindentation and nanotribology are fundamental, evolving, and complementary disciplines within materials science. In recent years there has been rapid convergence of the biomechanical and materials disciplines, as well as explosive growth of the nanotube and nanostructured materials fields. The expansion of nanomechanical testing into these new fields has been accompanied by similarly rapid growth in our understanding of, and ability to perform, mechanical tests with ever-smaller forces and displacements. This occurs even as the materials and relevant length scales diverge from traditional engineering materials. Furthermore, the understanding of fundamental mechanical measurement techniques must continue to advance to understand and design new systems and materials to meet the challenges of technology.

Symposium AA had nearly 100 presentations from participants from 13 countries. This volume contains many of the presentations from Symposium AA, including those from a joint session with Symposium OO, “Solids at the Biological Interface.” Focused session topics in Symposium AA included *in situ* methods, nanotribology and nanostructures, modeling and analysis of indentation, the nanomechanics of polymers, tribology of biological materials, size effects and thin films, and temperature- or time-dependent indentation phenomena. We hope that this volume — a snapshot of the state-of-the-art in nanoindentation and nanotribology — will serve as a useful reference, and creative inspiration, for students, scientists, and engineers in the nanomechanical disciplines.

Eric Le Bourhis
Dylan J. Morris
Michelle L. Oyen
Ruth Schwaiger
Thorsten Staedler

February 2008

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We greatly appreciate the excellent administrative and technical support provided by the MRS staff, which was a major contribution to the success of this symposium.

We would like to thank the session chairs for doing an excellent job in keeping the program on schedule, and for moderating stimulating discussion throughout.

Finally, we are most appreciative to the community of authors for submitting their latest research results and advances for publication in this volume. We owe much gratitude to peer-reviewers whose diligent and thorough reviews made these proceedings possible.

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