Structure and Mechanical Properties of Nanophase Materials— Theory and Computer Simulation vs. Experiment

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Structure and Mechanical Properties of Nanophase Materials—Theory and Computer Simulation vs. Experiment

Symposium held November 28–30, 2000, Boston, Massachusetts, U.S.A.

EDITORS:

Diana Farkas
Virginia Polytechnic Institute and State University
Blacksburg, Virginia, U.S.A.

Harriet Kung
Los Alamos National Laboratory
Los Alamos, New Mexico, U.S.A.

Merrilea Mayo
Pennsylvania State University
University Park, Pennsylvania, U.S.A.

Helena Van Swygenhoven
Paul Scherrer Institute
Villigen, Switzerland

Julia Weertman
Northwestern University
Evanston, Illinois, U.S.A.

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PREFACE

Symposium B, "Structure and Mechanical Properties of Nanophase Materials—Theory and Computer Simulations vs. Experiment," was held November 28–30 at the 2000 MRS Fall Meeting in Boston, Massachusetts. This symposium received support from the Office of Naval Research, Los Alamos National Laboratory, JEOL USA, Inc., and the FEI Company.

This symposium focused on an examination of the mechanical properties of nanostructured materials obtained from theoretical studies, computer modeling (involving length scales from atomic to macroscopic), and from experiments. An emphasis is placed on (1) the guidance that computer modeling can give in designing experiments as well as to their interpretation, and (2) the guidance suggested by experiments and characterization of actual nanocrystalline samples in setting up the initial structure of a computer model and the development of new potentials. Nanostructured materials of interest include metals, ceramics and composites, in bulk form, thin films, and layered structures. Two half-day oral sessions were held on the topic of Mechanical Properties and Deformation Behavior of Bulk Materials. Other half-day oral sessions were devoted to the areas of Mechanical Properties and Deformation Behavior of Multilayers: Ceramic Materials; and Clusters and Other Nanostructures. In addition, a half-day joint session was held with Symposium W, "Limits of Strength in Theory and Practice." The subject of the Symposium B papers in this session concerned Softening at Very Small Grain Sizes. Finally two poster sessions were devoted to various aspects of the behavior of nanostructured materials.

Most of the papers presented at the symposium are collected in these proceedings. The editors wish to thank the authors, reviewers, Meeting Chairs, sponsors and the ever-efficient and helpful MRS staff for their help in organizing the symposium and in publishing these proceedings.

Diana Farkas
Harriet Kung
Merrilea Mayo
Helena Van Swygenhoven
Julia Weertman

March 2001

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