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Mechanisms and Principles of Epitaxial Growth in Metallic Systems

Editors: Luc T. Wille, Christopher P. Burmester, Kiyoyuki Terakura, George Comsa
and Ellen D. Williams

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Mechanisms and Principles of Epitaxial Growth in Metallic Systems

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PREFACE

This volume contains papers that were presented during Symposium AA, "Mechanisms and Principles of Epitaxial Growth in Metallic Systems," at the 1998 MRS Spring Meeting. The symposium brought together theorists and experimentalists to review recent progress in understanding metallic thin-film growth, starting at the atomistic level. This is an increasingly important area of research since improved modelling techniques translate into reduced costs for new materials development, and atomic-level measurements provide the information necessary for making such modelling accurate. This volume provides an excellent overview of accomplishments to date, both in theory and experiment, as well as the challenges that lie ahead.

Several papers in this volume indicate that a wide range of experimental techniques yields a wealth of information that is both interesting in its own right and needed to develop reliable computational models. Measured data includes static features (island distribution, morphology, etc.) as well as dynamics (diffusion of atoms and islands). A number of contributions address efforts to coordinate these experimental observations with computational approaches. To accomplish this, realistic theories such as the Kinetic Monte Carlo method and molecular dynamics simulations complement traditional techniques such as Mean Field Theory and continuum mechanics. Several authors also touch upon the technological applications of epitaxially grown systems and illustrate the need for a better fundamental understanding of this phenomenon.

The symposium was supported by the Center for Theoretical and Computational Materials Science (National Institute for Standards and Technology), Hitachi, Ltd., IBM (RS/6000 Division), NEC Corporation, and Sun Microsystems. The organizers gratefully acknowledge the assistance of these organizations.

Luc T. Wille
Christopher P. Burmester
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