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Edited by Michael O. Thompson, S. Thomas Picraux and James S. Williams

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Edited by Michael O. Thompson, S. Thomas Picraux and James S. Williams

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Preface

This volume contains papers presented at the Materials Research Society symposium on **Beam-Solid Interactions and Transient Processes** which was held December 1-4, 1986 in Boston Massachusetts. This symposium, held annually for the last seven years, has been instrumental in the development of laser annealing, rapid thermal annealing and silicon-on-insulator materials. This year's symposium continued in this tradition of presenting new and stimulating results. As in the past, the emphasis was on the processes which take place in solids due to intense excitation by laser, electron, ion and other energy beams with timescales ranging from femtoseconds to seconds. Although the emphasis was on fundamentals of the interactions, there is a continuing exploration of the technological implications of these processes for materials applications.

The symposium began with two plenary sessions in conjunction with symposia on **Photon, Beam and Plasma Stimulated Chemical Processes at Surfaces and Science and Technology of Rapidly Quenched Alloys**. The plenary talks by eight internationally recognized scientists both reviewed the current understanding of beam interactions and discussed several of the new directions research in this field is taking. The seven contributed sessions consisted of over 100 papers and covered topics including fundamentals of beam-solid interactions, laser and ion-induced phase transformations, thermodynamics and kinetics of rapid phase transformations, advances in silicon-on-insulator growth and characterization, characterization of defects during rapid thermal processing, and new applications for rapid thermal processing of materials.

This first section in this volume contains manuscripts from the joint plenary sessions. The following sections, while not necessarily following the order of presentation at the meeting, are organized according to general topical areas. All papers in this volume have been refereed using the peer review process. The symposium and these proceedings again reveal how rapidly the knowledge and understanding of this important field are changing.

Symposium Co-Chairmen

M.O. Thompson S.T. Picraux J.S. Williams

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Further, we wish to acknowledge all those who helped to referee these papers. And, finally, we gratefully acknowledge the time and effort expended by all those who presented papers and contributed manuscripts to these proceedings.