Edited by Uwe Bovensiepen,
Hrvoje Petek, Martin Wolf

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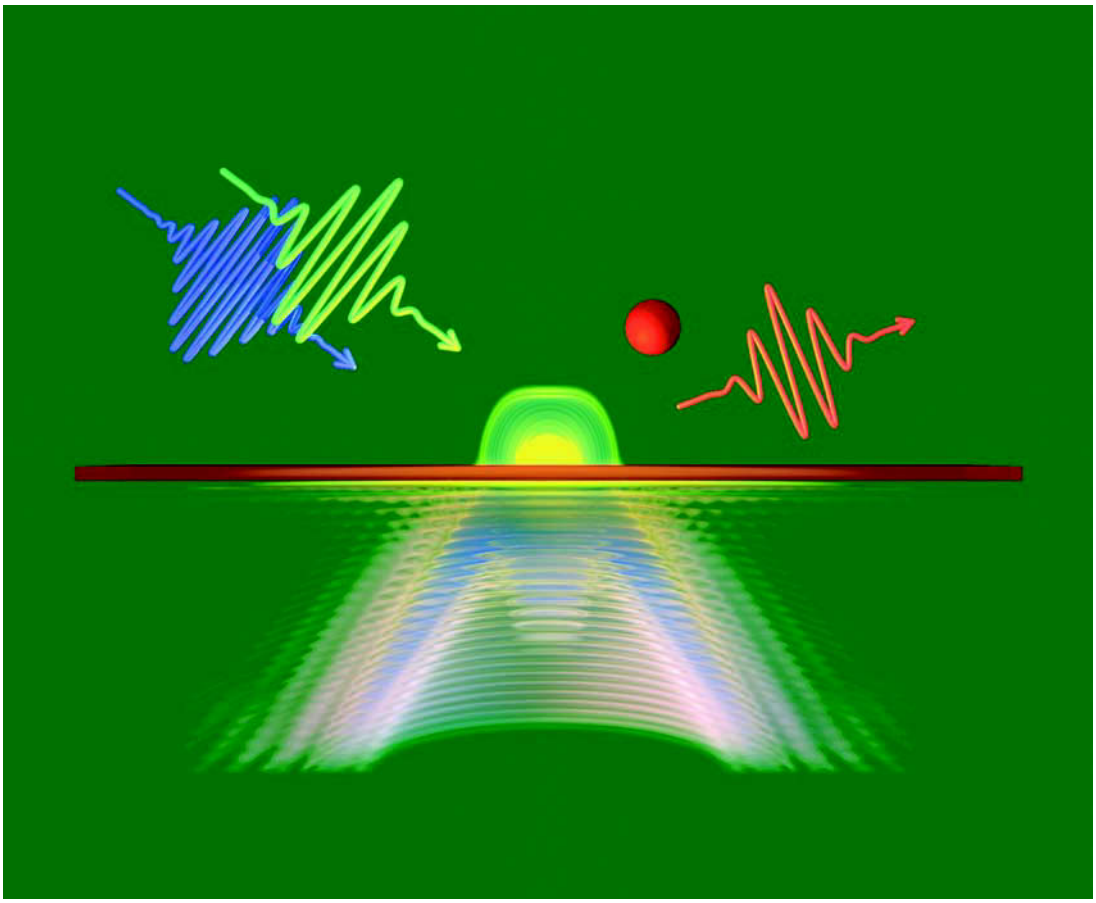
Dynamics at Solid State Surfaces and Interfaces

Volume 2: Fundamentals



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Dynamics at Solid State Surfaces and Interfaces

Volume 2: Fundamentals

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Cover
The cover figure depicts (i) a time-resolved experiment at an interface using time-delayed pump and probe femtosecond laser pulses (left) and the detected response (right) being either reflected light or a photoemitted electron. In addition (ii) charge transfer from an excited resonance of an alkali atom to single crystal metal substrate is shown. The false color scale represents the wave packet propagation which was calculated by A. G. Borisov including the many-body response of the metal. The figure was designed and created by A. Winkelmann.

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Preface

The dynamics of elementary processes in solids are decisive for various physical properties of solid state materials and their application in devices. This book intends to provide an introductory and comprehensive overview of the fundamental concepts, techniques and underlying elementary processes in the field of ultrafast dynamics of solid state surfaces and interfaces. While the first volume addresses recent research on quasiparticle dynamics, collective excitations, electron transfer and photoinduced dynamics, the focus of this second volume lies on fundamentals and provides introductory information on elementary processes and light-matter interaction. Our goal is to make these concepts accessible also to non-experts and, in particular, to newcomers and younger researchers in the field of ultrafast dynamics of solids, their interfaces and nanostructured materials. We hope that both volumes will help to further new research directions and developments in this field.

We acknowledge support from our funding agencies, important contributions from our co-workers, stimulating discussions with colleagues and the understanding from our families that were essential to realize this book.

Duisburg, Pittsburgh and Berlin, January 2012

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