Preface

When we started to apply Kelvin probe force microscopy (KPFM) for the characterization of thin film solar cell materials in 1998 at the Hahn Meitner Institute in Berlin, KPFM was still a very specialized technique, little known and only available in a few laboratories world wide. Nevertheless, at this time already 7 years had passed since the first report of KPFM in 1991.

Eight years later, KPFM had become a quite well spread technique being applied in many laboratories for a whole variety of sample characterization and for the investigation of different questions in many material systems. At this time, we decided to organize a KPFM workshop as a satellite meeting to the Non-Contact Atomic Force Microscopy conference in the fall 2008 in Madrid, Spain. We expected the number of participants to be on the order of 20–40, since this was the number of experts that were more or less working in this field. However, to our surprise, the workshop found many more interested participants reaching an attendance of more than 100 participants. Being a half day workshop, the program was rather limited and consisted in only five oral presentations and one discussion session. The talks were given by KPFM experts, namely Christian Loppacher on "Kelvin Probe Force Microscopy: A comparison of different methods and their resolution in experiment and simulation," Yossi Rosenwaks on "Quantitative KPFM: Semiconductors and self-assembled monolayers," Lev Kantorovich on "Atomistic simulations of AFM junctions using SciFi code with possible applications for KPFM," Laurent Nony on "Some aspects of high-resolution imaging in KPFM," and Hiroshi Onishi on "Charge transfer induced by adatoms and admolecules."

After this event the idea came up to ask the speakers to write down their notes and assemble some kind of a compendium for future use and reference. This initial idea finally developed into the present book, extending the workshop contributions by 8 additional chapters on further topics of interest. After 2 years we finally finished assembling the first book on KPFM, hoping to give many readers, newcomers to the field as well as experts, a way to learn a new technique, expand their knowledge about KPFM and as a reference for the daily use.

We would like to thank the patient contributing authors and our many collaborators we had in our respective institutions throughout the last 12 years working in the field of KPFM and NC-AFM.

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