# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>PREFACE</td>
<td>ix</td>
</tr>
<tr>
<td>ON THE NATO ASI</td>
<td>xiii</td>
</tr>
<tr>
<td>ON THE BOOK</td>
<td>xv</td>
</tr>
<tr>
<td>ACKNOWLEDGEMENTS</td>
<td>xvi</td>
</tr>
<tr>
<td>PHOTO OF THE GROUP</td>
<td>xvii</td>
</tr>
<tr>
<td>ADDRESS LIST OF THE AUTHORS</td>
<td>xxi</td>
</tr>
<tr>
<td>LIST OF PARTICIPANTS</td>
<td>xxv</td>
</tr>
</tbody>
</table>

## Part I – Fundamentals of Functional Materials

- **FUNCTIONAL MATERIALS: PROPERTIES, PROCESSING AND APPLICATIONS**  
  *P.M. Vilarinho*  
  3  
- **SCALING OF SILICON-BASED DEVICES TO SUBMICRON DIMENSIONS**  
  *A.I. Kingon*  
  35  
- **UNSOLVED PROBLEMS IN FERROELECTRICS FOR SCANNING PROBE MICROSCOPY**  
  *J.F. Scott*  
  51

## Part II – Fundamentals of Scanning Probe Techniques

- **PRINCIPLES OF BASIC AND ADVANCED SCANNING PROBE MICROSCOPY**  
  *D.A. Bonnell and R. Shao*  
  77  
- **NANOSCALE PROBING OF PHYSICAL AND CHEMICAL FUNCTIONALITY WITH NEAR-FIELD OPTICAL MICROSCOPY**  
  *L.M. Eng*  
  103  
- **NANOSCALE ELECTRONIC MEASUREMENTS OF SEMICONDUCTORS USING KELVIN PROBE FORCE MICROSCOPY**  
  *Y. Rosenwaks and R. Shikler*  
  119  
- **EXPANDING THE CAPABILITIES OF THE SCANNING TUNNELING MICROSCOPE**  
  *K.F. Kelly, Z.J. Donhauser, B.A. Mantooth and P.S. Weiss*  
  153
vi

FUNCTIONS OF NC – AFM ON ATOMIC SCALE
S. Morita, N. Oyabu, T. Nishimoto, R. Nishi, O. Custance, I. Yi and Y. Sugawara

Part III – Application of Scanning Techniques to Functional Materials

SCANNING PROBE MICROSCOPY OF PIEZOELECTRIC AND TRANSPORT PHENOMENA IN ELECTROCRYSTAL CERAMIC MATERIALS
S.V. Kalinin and D.A. Bonnell

SFM-BASED METHODS FOR FERROELECTRIC STUDIES
A. Gruberman

SCANNING TUNNELING SPECTROSCOPY: LOCAL DENSITY OF STATES AND SPIN DISTRIBUTION OF INTERACTING ELECTRON SYSTEMS
M. Morgenstern

NANOINSPECTION OF DIELECTRIC AND POLARIZATION PROPERTIES AT INNER AND OUTER INTERFACES IN FUNCTIONAL FERROELECTRIC PZT THIN FILMS
L.M. Eng

MICROSCALE CONTACT CHARGING ON A SILICON OXIDE
S. Morita, T. Uchihashi, K. Okamoto, M. Abe and Y. Sugawara

CONSTRUCTIVE NANOLITHOGRAPHY
S.R. Cohen, R. Maoz and J. Sagiv

NANOMETER-SCALE ELECTRONICS AND STORAGE

Part IV – Contributed papers

STM TIPS FABRICATION FOR CRITICAL DIMENSION MEASUREMENTS
A. Pasquini, G.B. Picotto and M. Pisani

SCANNING PROBE MICROSCOPY CHARACTERIZATION OF FERROELECTRICS DOMAINS AND DOMAINS WALLS IN KTiOPO4
C. Canalias, R. Clemens, J. Hellstrom, F. Laurell, J. Wittborn and H. Karlsson

IMAGING LOCAL DIELECTRIC AND MECHANICAL RESPONSES WITH DYNAMIC HETERO-CHARGE ELECTROSTATIC FORCE MICROSCOPY
D.R. Oliver, K.M. Cheng, A. Pu, D.J. Thomson and G.E. Bridges
AFM PATTERNING OF SrTiO$_{3-x}$ THIN FILMS AND DEVICE APPLICATIONS
L. Pellegrino 387

NANOSCALE INVESTIGATION OF A RAYLEIGH WAVE ON LiNbO$_3$
J. Yang and R. Koch 399

SCANNING CAPACITANCE FORCE MICROSCOPY AND KELVIN PROBE FORCE MICROSCOPY OF NANOSTRUCTURES EMBEDDED IN SiO$_2$
G. Tallarida, S. Spiga and M. Fanciulli 405

ELECTRICAL CHARACTERISATION OF III-V BURIED HETEROSTRUCTURE LASERS BY SCANNING CAPACITANCE MICROSCOPY
O. Douhéret, K. Maknys and S. Anand 413

PROBING THE DENSITY OF STATES OF HIGH TEMPERATURE SUPERCONDUCTORS WITH POINT CONTACT TUNNELING SPECTROSCOPY
L. Ozyuzer, J.F. Zasadzinski, N. Miyakawa and K.E. Gray 425

ANNEALING INFLUENCE ON CO ULTRATHIN FILM MORPHOLOGY IN MBE GROWN Co/Au BILAYERS
A. Wawro, L.T. Baczewski, P. Pankowski, P. Aleszkiewicz, M. Kisielewski, I. Sveklo and A. Maziewski 435

CORRELATION BETWEEN THE SURFACE RELIEF AND INTERFACES STRUCTURE OF Fe/Cr SUPERLATTICES AND ELECTROMAGNETIC WAVES PENETRATION
A. Rinkevich, L. Romashev and V. Ustinov 443

MAGNETORESISTANCE AND MICROSTRUCTURE OF MAGNETIC THIN FILM MULTILAYERS
J. Neamtu, M. Volmer 449

SPM INVESTIGATION OF THIOLATED GOLD NANOPARTICLE PATTERNS DEPOSITED ON DIFFERENT SELF-ASSEMBLED SUBSTRATES
F. Sbrana, M. T. Parodi, D. Ricci and E. Di Zitti 457

AFM OF GUANINE ADSORBED ON HOPG UNDER ELECTROCHEMICAL CONTROL
A. M. Chiorcea and A.M. Oliveira Brett 467

DYNAMICS IN MODEL MEMBRANES AND DNA-MEMBRANE COMPLEXES USING TEMPERATURE CONTROLLED ATOMIC FORCE MICROSCOPY
Z.V. Leonenko and D.T. Cramb 475

INDEX 485