

Advances in Atom and Single Molecule Machines

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Atomic Scale Interconnection Machines

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Preface

Atom Technology is essential for the construction and study of dangling bond logic circuits, single molecule logic gates and for single molecule mechanical machineries. One of the first instruments urgently required for experimental work at the atomic scale is a machine with an atomic scale precision offering the possibility to exchange information and energy with single and well-identified molecule machineries. These nano-communication-like machines must also offer dedicated navigation abilities for the interconnection probes to be positioned on the device with atomic scale precision. As a result of this need for such instruments in many laboratories around the world, the Integrated European Project AtMol decided to organize its first biannual workshop on the topic of “Atomic Scale Interconnection Machines”. Fully supported by the ICT-FET of INFSO at the European level, AtMol was launched on 1 January 2011, for 4 years, with the objective to construct the first ever complete molecular chip. This Atomic Scale Interconnection Machines workshop event took place at IMRE in June 2011, where IMRE-A*STAR is the AtMol partner based in Singapore.

This first volume of the new Springer Series “Advances in Atom and Single Molecule Machines” compiles all the contributions presented during this workshop. The workshop was the first to involve a large number of laboratories from all around the world working on the construction, the development or usage of atomic scale interconnection machines. All the possible categories of these very often large, ultra high vacuum (UHV) instruments were presented by different communities, from academics to high-tech companies who develop the new hardware, or control the software of these machines. Examples include, multiple LT-UHV STM systems, multiple LT-NC-AFM systems, optical navigation, SEM navigation and even the first machines demonstrating single atom and molecular manipulation capability together with the nano-communication setup.

The organizing committee of the first workshop of the AtMol series is happy to thank the ICT-FET division of European Commission and A*STAR of Singapore for the financial support to organize this first workshop. We are expecting to

launch a quite unique series of events to boost Atom Technologies from a practical point of view. The upcoming workshops in the AtMol series will be announced on the www.atmol.eu official web site. The organizing committee also wishes to thank all the participants in Singapore for a very dynamic workshop.

For the organizing committee
C. Joachim

Contents

High Precision Local Electrical Probing: Potential and Limitations for the Analysis of Nanocontacts and Nanointerconnects.	1
B. Guenther, M. Maier, J. Koeble, A. Bettac, F. Matthes, C. M. Schneider and A. Feltz	
Ultra-Compact Multitip Scanning Probe Microscope with an Outer Diameter of 50 nm	9
Vasily Cherepanov, Evgeny Zubkov, Hubertus Junker, Stefan Korte, Marcus Blab, Peter Coenen and Bert Voigtländer	
Atomic Scale Interconnection Machine.	23
O. A. Neucheva, R. Thamankar, T. L. Yap, C. Troadec, J. Deng and C. Joachim	
The DUF Project: A UHV Factory for Multi-Interconnection of a Molecule Logic Gates on Insulating Substrate	35
D. Martrou, L. Guiraud, R. Laloo, B. Pecassou, P. Abeilhau, O. Guillermet, E. Dujardin, S. Gauthier, J. Polesel Maris, M. Venegas, A. Hinault, A. Bodin, F. Chaumeton, A. Piednoir, H. Guo and T. Leoni	
Challenges and Advances in Instrumentation of UHV LT Multi-Probe SPM System	53
Zhouhang Wang	
On the Road to Multi-Probe Non-Contact AFM.	81
T. Vančura, S. Schmitt, V. Friedli, S. Torbrügge and O. Schaff	

Atomically Precise Manufacturing: The Opportunity, Challenges, and Impact	89
John N. Randall, James R. Von Ehr, Joshua Ballard, James Owen, Rahul Saini, Ehud Fuchs, Hai Xu and Shi Chen	
Combined STM and Four-Probe Resistivity Measurements on Single Semiconductor Nanowires	107
M. Berthe, C. Durand, T. Xu, J. P. Nys, P. Caroff and B. Grandidier	
Probing Electronic Transport of Individual Nanostructures with Atomic Precision	119
Shengyong Qin and An-Ping Li	
Surface Conductance Measurements on a MoS₂ Surface Using a UHV-Nanoprobe System	131
R. Thamankar, O. A. Neucheva, T. L. Yap and C. Joachim	
Multi-Probe Characterization of 1D and 2D Nanostructures Assembled on Ge(001) Surface by Gold Atom Deposition and Annealing	141
M. Wojtaszek, M. Kolmer, S. Godlewski, J. Budzioch, B. Such, F. Krok and M. Szymonski	
Nanometer-Scale Four-Point Probe Resistance Measurements of Individual Nanowires by Four-Tip STM	153
S. Hasegawa, T. Hirahara, Y. Kitaoka, S. Yoshimoto, T. Tono and T. Ohba	
Silicon Surface Conductance Investigated Using a Multiple-Probe Scanning Tunneling Microscope	167
Janik Zikovsky, Mark H. Salomons, Stanislav A. Dogel and Robert A. Wolkow	
Atomic-Scale Devices in Silicon by Scanning Tunneling Microscopy	181
J. A. Miwa and M. Y. Simmons	
Electronic Transport on the Nanoscale	197
C. A. Bobisch, A. M. Bernhart, M. R. Kaspers, M. C. Cottin, J. Schaffert and R. Möller	

Solid State Nano Gears Manipulations	215
Cedric Troadec, Jie Deng, Francisco Ample, Ramesh Thamankar and Christian Joachim	
Probing Single Molecular Motors on Solid Surface.	225
Haiming Guo, Yeliang Wang, Min Feng, Li Gao and Hongjun Gao	