

Research Profile



Prof. Dr. Thomas Schimmel

- Professor of Physics, Institute of Applied Physics, KIT South Campus and
- Head of Department at the Institute of Nanotechnology, KIT North Campus, Karlsruhe Institute of Technology
- Chair of the Research Network “Functional Nanostructures” Baden-Württemberg
- Editor-in-Chief, Beilstein Journal of Nanotechnology

Scientific Career

- 03/85** Diplom in Physics, University of Bayreuth
- 03/85 – 07/89** PhD (Dr. rer. nat.) with Prof. M. Schwoerer, University of Bayreuth
- 09/89 – 12/90** Postdoc as BASF Fellow with Prof. H. Fuchs, BASF, Ludwigshafen
- 01/91 – 02/96** Research Assistant, University of Bayreuth
- 07/95** Habilitation, University of Bayreuth;
Offers of Professorial Positions: 1) Ludwig-Maximilians-Universität München, 2) Universität Linz, 3) Universität Karlsruhe
- Since 03/96** Professor of Physics & Joint Institute Director, Inst. of Appl. Physics, Head of Department, Institute of Nanotechnology (since 1998), Scientific Coordinator of the Network of Excellence on Functional Nanostructures in Baden-Württemberg

Selected Achievements and Awards

- 1987: **Emil Warburg Research Prize**
- 1993: **Advanced Materials Prize**
- 1994: **Phillip Morris Research Prize**
- 2001: **Research Prize of the State of Baden-Württemberg**
- 2004: **First demonstration of a Single-Atom Transistor**
- 2010: **Discovery of the Salvinia Effect** (together with W. Barthlott [3])
- since 2002: **Foreign Advisory Professor**, Shanghai Jiao Tong University
- since 2009: **Editor-in-Chief**, Beilstein Journal of Nanotechnology

Fields of Interest

- Physics and chemistry on the nanometer scale, nanotechnology, constructive nanolithography and atomic-scale devices.
- Atomic Force Microscopy, AFM tip-sample interaction and nanotribology.
- Electrochemistry & materials research on the nm scale.
- Physics and Chemistry of functional surfaces and interfaces.
- Biomimetic functional surfaces and the Salvinia Effect.
- The Single-Atom Transistor

Research Profile

Ten Selected Publications

- [1] Lipid Multilayer Gratings**
S. Lenhert, F. Brinkmann, T. Laue, S. Walheim, Ch. Vannahme, S. Klinkhammer, M. Xu, S. Sekula, T. Mappes, Th. Schimmel, H. Fuchs.
Nature Nanotechnology, **5**(4), 275–279 (2010)
- [2] Multi-Level Atomic-Scale Transistors Based on Metallic Quantum Point Contacts**
F.-Q. Xie, R. Maul, Ch. Obermair, G. Schön, Th. Schimmel, W. Wenzel.
Advanced Materials, **22**(18), 2033–2036 (2010)
- [3] The Salvinia Paradox: Superhydrophobic Surfaces with Hydrophilic Pins for Air Retention under Water**
W. Barthlott, Th. Schimmel, S. Wiersch, K. Koch, M. Brede, M. Barczewski, S. Walheim, A. Weis, A. Kaltenmaier, A. Leder, H.F. Bohn.
Advanced Materials, **22**(21), 2325–2328 (2010), Cover Article
- [4] High Aspect Ratio Constructive Nanolithography with a Photo-Dimerizable Molecule**
M. Barczewski, S. Walheim, T. Heiler, A. Blaszczyk, M. Mayor, Th. Schimmel.
Langmuir, **26**(5), 3623–3628 (2010)
- [5] Influence of the Relative Humidity on the Demixing of Polymer Blends on Prepatterned Substrates**
T. Geldhauser, S. Walheim, Th. Schimmel, P. Leiderer, J. Boneberg.
Macromolecules, **43**(2), 1124–1128 (2010)
- [6] Templated Self-Assembly of ZnO Films on Monolayer Patterns with Nanoscale Resolution**
L. Pitta Bauermann, P. Gerstel, J. Bill, S. Walheim, Ch. Huang, J. Pfeifer, Th. Schimmel.
Langmuir **26**(6), 3774–3778. (2010)
- [7] The Single-Atom Transistor: Perspectives for Quantum Electronics on the Atomic-Scale**
Ch. Obermair, F.-Q. Xie, Th. Schimmel.
Europhysics News, Invited Article, **41**(14), July–August (2010)
- [8] Conductance of Atomic-Scale Pb Contacts in an Electrochemical Environment**
F.-Q. Xie, F. Hüser, F. Pauly, Ch. Obermair, G. Schön, Th. Schimmel.
Phys. Rev. B **82**, 075417-1-5 (2010)
- [9] Nanoscale Twinned Copper Nanowire Formation by Direct Electrodeposition**
S. Zhong, Th. Koch, M. Wang, T. Scherer, S. Walheim, H. Hahn, Th. Schimmel.
Small, **5**(20), 2265–2270 (2009), Cover Article
- [10] Independently Switchable Atomic Quantum Transistors by Reversible Contact Reconstruction**
F.-Q. Xie, R. Maul, A. Augenstein, Ch. Obermair, E.B. Starikov, G. Schön, Th. Schimmel, W. Wenzel.
Nano Lett. **8**(9), 2944–2948 (2008)