

AG Kuch
Scientific Activity Report 2015

Scientists:

Arruda, Lucas

Bernien, Matthias

Britton, Andrew

Chemam, Faiçal (20.10.–02.11.)

Kipgen, Lalminthang

Khan, Yaqoob (02.07.–15.09.)

Kuch, Wolfgang

Nickel, Fabian

Sajjad, Muhammad (02.07.–15.09.)

Sandig, Oliver

Shokr, Yasser

Song, Jiaming (until 30.09.)

Tauqir (since 12.11.)

Ullah, Ikram (02.07.–15.09.)

Bachelor, Master, and Diploma students:

Blümel, Norman (until 26.01.)

Kohlmann, Marcel (23.01.–10.07.)

Krüger, Dennis (until 10.09.)

Kubsch, Timo (19.05.–21.07.)

Publications:

M. Bernien, H. Naggert, L. M. Arruda, L. Kipgen, F. Nickel, J. Miguel, C. F. Hermanns, A. Krüger, D. Krüger, E. Schierle, E. Weschke, F. Tucek, and W. Kuch
Highly Efficient Thermal and Light-Induced Spin-State Switching of an Fe(II) Complex in Direct Contact with a Solid Surface
ACS Nano **9**, 8960–8966 (2015).

M. Erkovan, Y. A. Shokr, D. Schiestl, C.-B. Wu, and W. Kuch
Influence of $\text{Ni}_x\text{Mn}_{1-x}$ thickness and composition on the Curie temperature of Ni in $\text{Ni}_x\text{Mn}_{1-x}/\text{Ni}$ bilayers on $\text{Cu}_3\text{Au}(001)$
J. Magn. Magn. Mater. **373**, 151–154 (2015).

W. Kuch, R. Schäfer, P. Fischer, and F. U. Hillebrecht
Magnetic Microscopy of Layered Structures
ISBN 978-3-662-44532-7
Springer, Berlin Heidelberg (2015).

H. Naggert, J. Rudnik, L. Kipgen, M. Bernien, F. Nickel, L. M. Arruda, W. Kuch, C. Näther, and F. Tucek
Vacuum-evaporable spin-crossover complexes: physicochemical properties in the crystalline bulk and in thin films deposited from the gas phase
J. Mater. Chem. C **3**, 7870–7877 (2015).

Y. A. Shokr, M. Erkovan, C.-B. Wu, B. Zhang, O. Sandig, and W. Kuch
Temperature-induced sign change of the magnetic interlayer coupling in $\text{Ni}/\text{Ni}_{1.25}\text{Mn}_{0.75}/\text{Ni}$ trilayers on $\text{Cu}_3\text{Au}(001)$
J. Appl. Phys. **117**, 175302-1–4 (2015).

J. Song, C.-B. Wu, B. Zhang, J. Xu, and W. Kuch
Layer-dependent properties and noncollinear spin structure of epitaxial antiferromagnetic Mn films on $\text{Co}/\text{Cu}(001)$
Phys. Rev. B **91**, 214406-1–9 (2015).

W. Wang, M. Beg, B. Zhang, W. Kuch, and H. Fangohr
Driving magnetic skyrmions with microwave fields
Phys. Rev. B **92**, 020403(R)-1–5, 2015

B. Zhang, W. Wang, M. Beg, H. Fangohr, and W. Kuch
Microwave-induced dynamic switching of magnetic skyrmion cores in nanodots
Appl. Phys. Lett. **106**, 102401-1–4 (2015).

Presentations:

a) invited talks

M. Bernien

Highly Efficient Thermal and Light-Induced Spin-State Switching of an Fe(II) Complex in Direct Contact with a Solid Surface

Seventh Joint BER II and BESSY II User Meeting, Berlin, 09.–11.12.2015.

W. Kuch

- Magnetism in reduced dimensions and current challenges in magnetic data storage
 - Paramagnetism of adsorbed magnetic molecules and its measurement by x-ray magnetic circular dichroism
 - Magnetic domains and magnetic domain imaging
 - Controlling the magnetic interactions in magnetic molecules on surfaces
 - Magnetic properties of antiferromagnetic/ferromagnetic thin film systems
 - Ferromagnetic coupling in self-assembled metal-organic networks at surfaces
- Workshop on Contemporary Topics in Nanomagnetism, Islamabad (Pakistan), 23.–26.02.2015.

W. Kuch

Magnetic molecules on surfaces and their measurement by x-ray absorption spectroscopy
International Max Planck Research School Lecture Series, Max-Planck-Institute of Colloids and Interfaces, Potsdam, 20.05.2015.

W. Kuch

- Exploring the magnetic interactions in metal-organic surface structures
 - Spin-crossover transition in magnetic molecules adsorbed on solid surfaces
- XXII International Summer School „Nicolás Cabrera“: New Directions in Spintronics and Nanomagnetism, Miraflores de la Sierra (Spain), 11.–16.07.2015.

W. Kuch

Controlling the magnetism of adsorbed metal-organic molecules
22nd International Colloquium on Magnetic Films and Surfaces (ICMFS), Cracow (Poland), 12.–17.07.2015.

W. Kuch

Exploring surface-adsorbed rare-earth metal-organic molecules by soft x rays
THz to Soft X-Ray Workshop, BESSY II, Berlin, 07.–08.12.2015.

W. Kuch

Controlling the magnetism of adsorbed metal-organic molecules
Berlin-St. Petersburg Workshop on Structure and Dynamics of Nanoscopic Matter, Berlin, 10.–11.12.2015.

b) contributed talks

M. Bernien, H. Naggert, Ch. F. Hermanns, F. Nickel, L. M. Arruda, L. Kipgen, J. Miguel, A. Krüger, D. Krüger, E. Schierle, E. Weschke, F. Tuczek, and W. Kuch
Light-Induced Switching of the Spin of Fe Complexes on Surfaces
79th Annual Meeting of the DPG and DPG Spring Meeting, Berlin, 15.–20.03.2015.

M. Bernien
Light-Induced Spin-State Switching of an Fe(II) Complex Adsorbed on HOPG
20th International Conference on Magnetism (ICM), Barcelona (Spain), 05.–10.07.2015.

O. Sandig, Y. Shokr, B. Zhang, J. Vogel, F. Kronast, and W. Kuch
Movement of magnetic domain walls induced by single femtosecond laser pulses
79th Annual Meeting of the DPG and DPG Spring Meeting, Berlin, 15.–20.03.2015.

J. Song, C.-B. Wu, B. Zhang, and W. Kuch
Exploring the spectroscopic contrast in spin-polarized scanning tunneling microscopy of the antiferromagnetic e-fct Mn surface: From sub-micrometer to Ångstrom length scales
79th Annual Meeting of the DPG and DPG Spring Meeting, Berlin, 15.–20.03.2015.

H. Wende, D. Klar, B. Krumme, C. Weis, C. Schmitz-Antoniak, S. Klyatskaya, B. Schäfer, M. Ruben, A. Candini, M. Affronte, M. Bernien, A. Krüger, C. F. Hermanns, J. Miguel, W. Kuch, E. Weschke, P. Ohresser, J.-P. Kappler, L. Joly, K. Kummer, S. Bhandary, H. C. Herper, B. Brena, P. M. Panchmatia, O. Eriksson, and B. Sanyal
Utilizing the interaction with surfaces to create new molecular-based spin-hybrid systems
16th International Conference on X-ray Absorption Fine Structure (XAFS 16), Karlsruhe, 23.–28.08.2015.

B. Zhang, W. Wang, M. Beg, H. Fangohr, and W. Kuch
Microwave-induced dynamic switching of magnetic skyrmion cores in nanodots
IEEE International Magnetics Conference (INTERMAG 2015), Beijing (PR China), 11.–15.05.2015.

c) posters

L. M. Arruda, M. Bernien, F. Nickel, L. Kipgen, Ch. F. Hermanns, J. Miguel, A. Krüger, D. Krüger, N. Hatter, J. Kopprasch, Q. Xu, and W. Kuch
Surface-Orientation-Dependent Spin Quenching of Adsorbed Co Porphyrin Molecules
79th Annual Meeting of the DPG and DPG Spring Meeting, Berlin, 15.–20.03.2015.

L. M. Arruda, M. Bernien, F. Nickel, L. Kipgen, Ch. F. Hermanns, J. Miguel, A. Krüger, D. Krüger, N. Hatter, J. Kopprasch, Q. Xu, and W. Kuch
Surface-orientation-dependent spin quenching of adsorbed Co porphyrin molecules
Seventh Joint BER II and BESSY II User Meeting, Berlin, 09.–11.12.2015.

M. Bernien, P. Stoll, D. Rolf, F. Nickel, Q. Xu, C. Hartmann, T. R. Umbach, J. Kopprasch, J. Ladenthin, E. Schierle, E. Weschke, C. Czekelius, K. J. Franke, and W. Kuch
XAS, XMCD, and Multiplet calculations of Paramagnetic Dy Complexes on Au(111)
Seventh Joint BER II and BESSY II User Meeting, Berlin, 09.–11.12.2015.

L. Kipgen, H. Naggert, M. Bernien, F. Nickel, J. Kopprasch, Q. Xu, F. Tucek, and W. Kuch
XAS Study of the Spin-Crossover Molecules Fe(bpz)₂phen and Fe(bpz)₂bipy on Surfaces
79th Annual Meeting of the DPG and DPG Spring Meeting, Berlin, 15.–20.03.2015.

L. Kipgen, H. Naggert, M. Bernien, F. Nickel, L. M. Arruda, A. Britton, J. Kopprasch, Q. Xu,
F. Tucek, and W. Kuch
The Optical and Thermal Spin State Switching of Fe(bpz)₂bipy on Surfaces
Seventh Joint BER II and BESSY II User Meeting, Berlin, 09.–11.12.2015.

W. Kuch, O. Sandig, Y. A. Shokr, B. Zhang, J. Vogel, and F. Kronast
Moving magnetic domain walls by single femtosecond laser pulses
Beilstein Nanotechnology Symposium 2015 „Magnetization Dynamics on the Nanometer
Scale“, Potsdam, 06.–09.09.2015.

H. Naggert, J. Rudnik, L. Kipgen, M. Bernien, F. Nickel, L. M. Arruda, W. Kuch, C. Näther,
and F. Tucek
Vacuum-evaporable spin–crossover complexes: Physicochemical properties in the crystalline
bulk and in thin films deposited from the gas phase
GDCh Wissenschaftsforum Chemie, Dresden, 30.08.–02.09.2015.

F. Nickel, M. Bernien, S. Wrzalek, M. Herder, P. Chittas, K. Kraffert, L. M. Arruda, L.
Kipgen, S. Hecht, and W. Kuch
Light-induced ring-closure isomerization of a diarylethene derivate in direct contact with
surfaces
79th Annual Meeting of the DPG and DPG Spring Meeting, Berlin, 15.–20.03.2015.

F. Nickel, M. Bernien, S. Wrzalek, M. Herder, P. Chittas, K. Kraffert, L. M. Arruda, L.
Kipgen, S. Hecht, and W. Kuch
Light-induced ring-closure isomerization of a diarylethene molecules adsorbed on solid
surfaces
Seventh Joint BER II and BESSY II User Meeting, Berlin, 09.–11.12.2015.

D. Rolf, P. Stoll, T. R. Umbach, J. N. Ladenthin, M. Bernien, C. Czekelius, W. Kuch, and K.
J. Franke
Inelastic Excitations in Rare-Earth-Based Metal-Organic Complexes
79th Annual Meeting of the DPG and DPG Spring Meeting, Berlin, 15.–20.03.2015.

D. Rolf, P. Stoll, M. Bernien, Q. Xu, F. Nickel, C. Hartmann, T. R. Umbach, J. Kopprasch, J.
N. Ladenthin, C. Czekelius, W. Kuch, and K. J. Franke
Origin of inelastic excitations in rare-earth based metal-organic complexes
598th WE-Heraeus-Seminar „Frontiers in Scanning Probe Microscopy“, Bad Honnef, 02.–
05.11.2015.

H. Ryll, F. Radu, O. Rader, T. Noll, D. A. Tennant, Y.-M. Chang, J. Miguel, W. Kuch, R.-M.
Abrudan, H. Zabel, G. Woltersdorf, M. Hollnberger, and C. Back
VEKMAG – A new end station at BESSY II for static and dynamic experiments in high
magnetic fields
„From PICO to FEMTO“ – Workshop on Time-Resolved Studies at BESSY II, Berlin, 26.–
27.01.2015.

H. Ryll, F. Radu, R.-M. Abrudan, H. Zabel, W. Kuch, G. Woltersdorf, and Ch. Back
VekMag - a vector magnet for BESSY II
79th Annual Meeting of the DPG and DPG Spring Meeting, Berlin, 15.–20.03.2015.

Degrees:

Blümel, Norman

Magnetic properties of $\text{Ho}_3\text{N}@C_{80}$ on Cu(100), Co/Cu(100) and Ni/Cu(100)
Bachelor degree, Freie Universität Berlin, January 2015.

Kohlmann, Marcel

Spin-Crossover von $\text{Fe}(\text{bpz})_2\text{Me}_{2,4}(\text{phen})$ Molekülen auf einer HOPG-Oberfläche
Bachelor degree, Freie Universität Berlin, July 2015.

Krüger, Alex

Schaltbare Moleküle auf metallischen und nichtmetallischen Oberflächen
PhD degree, Freie Universität Berlin, 21.01.2015.

Krüger, Dennis

Adsorptions- und Schaltverhalten von photochromen Spiropyran-Derivaten auf Oberflächen
Master degree, Freie Universität Berlin, September 2015.

Kubsch, Timo

Ferromagnetische Resonanz an ultradünnen YIG-Filmen
Bachelor degree, Freie Universität Berlin, July 2015.

Song, Jiaming

Structural, electronic and magnetic properties of ultrathin epitaxial manganese films
PhD degree, Freie Universität Berlin, 24.09.2015.