

**AG Kuch**  
**Scientific Activity Report 2009**

**Scientists:**

Bernien, Matthias

Hermanns, Ch. Felix (since 22.05.)

Khan, Yaqoob

Krüger, Alex (since 16.10.)

Kuch, Wolfgang

Kurde, Julia

Miguel, Jorge

Piantek, Marten (until 30.06.)

Sandow, Barbara

Stampe, Miriam

**Bachelor, Master, and Diploma students:**

Hellwig, Raphael (since 16.03. until 17.05.)

Homberg, Tobias (until 31.03.)

Krüger, Alex (until 31.03.)

Rackow, Philip (since 20.07. until 20.09.)

Sarihan, Menekse (since 05.10.)

Stoll, Paul (since 02.02.)

## **Publications:**

M. Ali, C. H. Marrows, B. J. Hickey, F. Offi, J. Wang, L. I. Chelaru, M. Kotsugi, and W. Kuch

Suppression of magnetization ripple by exchange bias  
Phys. Rev. B **79**, 064415-1–6 (2009).

M. Bernien, J. Miguel, C. Weis, Md. E. Ali, J. Kurde, B. Krumme, P. M. Panchmatia, B. Sanyal, M. Piantek, P. Srivastava, K. Baberschke, P. M. Oppeneer, O. Eriksson, W. Kuch, and H. Wende

Tailoring the Nature of Magnetic Coupling of Fe-Porphyrin Molecules to Ferromagnetic Substrates

Phys. Rev. Lett. **102**, 047202-1–4 (2009).

L. A. Chebotkevich, A. V. Ognev, Yu. P. Ivanov, K. Lenz, A. I. Il'in, and K. S. Ermakov  
Effect of Diffusion and Stresses on the Magnetic Properties of Multilayer Fe/Pd and Fe/Ge Films

Phys. Solid State **51**, 1870–1874 (2009).

H. A. Dürr, Th. Eimüller, H.-J. Elmers, S. Eisebitt, M. Farle, W. Kuch, F. Matthes, M. Martins, H.-Ch. Mertins, P. M. Oppeneer, L. Plucinski, C. M. Schneider, H. Wende, W. Wurth, and H. Zabel

A Closer Look into Magnetism: Opportunities with Synchrotron Radiation  
IEEE Trans. Magn. **45**, 15–57 (2009).

J. Miguel, R. Abrudan, M. Bernien, M. Piantek, C. Tieg, J. Kirschner, and W. Kuch  
Magnetic domain coupling study in single-crystalline Fe/CoO bilayers

J. Phys.: Condens. Matter **21**, 185004-1–6 (2009).

J. Miguel, J. Sánchez-Barriga, D. Bayer, J. Kurde, B. Heitkamp, M. Piantek, F. Kronast, M. Aeschlimann, H. A. Dürr, and W. Kuch

Time-resolved magnetization dynamics of cross-tie domain walls in permalloy microstructures

J. Phys.: Cond. Matt. **21**, 496001-1–6 (2009).

M. Piantek, G. Schulze, M. Koch, K. J. Franke, F. Leyssner, A. Krüger, C. Navío, J. Miguel, M. Bernien, M. Wolf, W. Kuch, P. Tegeder, and J.I. Pascual

Reversing the Thermal Stability of a Molecular Switch on a Gold Surface: Ring-Opening Reaction of Nitrospiropyran

J. Am. Chem. Soc. **131**, 12729–12735 (2009).

M. Piantek, J. Miguel, A. Krüger, C. Navío, M. Bernien, D. K. Ball, K. Hermann, and W. Kuch

Temperature, Surface, and Coverage-Induced Conformational Changes of Azobenzene Derivatives on Cu(001)

J. Phys. Chem C **113**, 20307–20315 (2009).

## **Presentations:**

### **a) invited talks**

W. Kuch

Magnetic properties of antiferromagnetic/ferromagnetic thin film systems and paramagnetic molecules adsorbed on ferromagnetic thin films  
National Taiwan University, Taipei (Taiwan), 23.02.2009.

W. Kuch

Imaging magnetization dynamics by x-ray magnetic circular dichroism photoelectron emission microscopy  
National Synchrotron Radiation Research Center, Hsinchu (Taiwan), 27.02.2009.

W. Kuch

X-ray spectroscopy of adsorbed paramagnetic and photochromic molecules  
Max-Planck-Institut für Festkörperforschung, Seminar der Abteilung Kern, Stuttgart, 08.04.2009.

W. Kuch

Imaging magnetization dynamics by x-ray magnetic circular dichroism photoelectron emission microscopy  
Magnetic Imaging and Spectroscopy Workshop, Diamond Light Source, Didcot (U.K.), 10.–11.06.2009.

W. Kuch

Controlling the Magnetic Coupling of Fe-Porphyrine Molecules to Ferromagnetic Films  
2009 MRS Fall Meeting, Boston (U.S.A.), 30.11.–04.12.2009.

B. Sandow

What Influences the Interests of Girls for Physics?  
Annual Meeting of the American Association for Physics Teachers and American Association for the Advancement of Science, Chicago (U.S.A.), 12.–16.02.2009.

B. Sandow

The IUPAP Working Group of Women in Physics  
Fermilab, Chicago (U.S.A.), 18.02.2009.

M. Stampe

Influence of  $\text{Fe}_x\text{Mn}_{1-x}$  layer and interface roughness on the antiferromagnetic ordering temperature in  $\text{Ni}/\text{Fe}_x\text{Mn}_{1-x}$  bilayers  
National Taiwan University, Taipei (Taiwan), 19.10.2009.

## **b) contributed talks**

M. Bernien, J. Miguel, C. Weis, M. Piantek, X. Xu, Ph. Eckhold, J. Kurde, K. Baberschke, W. Kuch, and H. Wende

Controlling the magnetic coupling of Fe-porphyrin molecules to ferromagnetic films: A temperature-dependent XMCD investigation

DPG Spring Meeting 2009 of the Condensed Matter Section, Dresden, 22.–27.03.2009.

A. Krüger, M. Piantek, C. Navío, J. Miguel, M. Bernien, and W. Kuch

Temperature and thickness dependent adsorption studies of azobenzene molecules on Cu(100)

DPG Spring Meeting 2009 of the Condensed Matter Section, Dresden, 22.–27.03.2009.

J. Miguel, M. Piantek, G. Schulze, K. Franke, A. Krüger, C. Navío, M. Bernien, W. Kuch, and J. I. Pascual

Ring Opening Reaction of Spiropyran on a Au(111) Surface

26th European Conference on Surface Science, Parma (Italy), 30.08.–04.09.2009.

M. A. Niño Orti, J. Camarero, K. Fukumoto, R. Abrudan, T. O. Montes, A. Locatelli, W. Kuch, J. J. de Miguel, and R. Miranda

Magnetic behavior of metastable fcc FeCu alloy thin films grown with the aid of a surfactant Pb layer

10th International Conference on Atomically Controlled Surfaces, Interfaces and Nanostructures, Granada (Spain), 21.–25.09.2009.

M. Piantek, C. Navío, A. Krüger, M. Bernien, J. Miguel, and W. Kuch

Ring opening reaction of spiropyran on a Au(111) surface

DPG Spring Meeting 2009 of the Condensed Matter Section, Dresden, 22.–27.03.2009.

M. Piantek, G. Schulze, K. Franke, J. Miguel, A. Krüger, C. Navío, M. Bernien, W. Kuch, and J. I. Pascual

Ring opening reaction of spiropyran on a Au(111) surface

10th International Conference on Atomically Controlled Surfaces, Interfaces and Nanostructures, Granada (Spain), 21.–25.09.2009.

G. Schulze, M. Piantek, C. Navío, J. Miguel, M. Koch, F. Leyssner, K. J. Franke, P. Tegeder, W. Kuch, and J. I. Pascual

Molecular chemistry at surfaces: Ring opening reaction of spiropyran molecules on a metal surface

DPG Spring Meeting 2009 of the Condensed Matter Section, Dresden, 22.–27.03.2009.

M. Stampe, T. Homberg, and W. Kuch

Thickness dependence of the antiferromagnetic ordering temperature in Ni/Fe<sub>x</sub>Mn<sub>1-x</sub> bilayers

DPG Spring Meeting 2009 of the Condensed Matter Section, Dresden, 22.–27.03.2009.

H. Wende, M. Bernien, J. Miguel, C. Weis, M. E. Ali, J. Kurde, B. Krumme, P. M.

Panchmatia, B. Sanyal, M. Piantek, P. Srivastava, K. Baberschke, W. Kuch, P. M. Oppeneer, and O. Eriksson

Tailoring the Nature of Magnetic Coupling of Fe-Porphyrin Molecules to Ferromagnetic Substrates

26th European Conference on Surface Science, Parma (Italy), 30.08.–04.09.2009.

### c) posters

M. Bernien, J. Miguel, C. Weis, J. Kurde, B. Krumme, M. Piantek, K. Baberschke, W. Kuch, and H. Wende

Tailoring the nature of magnetic coupling of Fe-porphyrins to ferromagnetic substrates  
20th International Colloquium on Magnetic Films and Surfaces, Berlin, 20.–24.07.2009.

M. Bernien, J. Miguel, J. Kurde, M. Piantek, K. Baberschke, W. Kuch, C. Weis, B. Krumme, and H. Wende

Tailoring the nature of magnetic coupling of Fe-porphyrins to ferromagnetic substrates  
First Joint BER II and BESSY II Users Meeting, Berlin, 12.–13.11.2009.

F. Chemam, K. Lenz, and W. Kuch

Influence of a Cr seed layer on the magnetic anisotropy of epitaxial Fe/Ag films on MgO(001)  
International Conference on Magnetism, Karlsruhe, 26.–31.07.2009

P. L. Gastelois, M. D. Martins, W. A. A. Macedo, J. Miguel, and W. Kuch

Structure and magnetism of  $\text{Co/Ni}_x\text{Mn}_{(1-x)}$  epitaxial films on  $\text{Cu}_3\text{Au}(100)$   
XXXII Encontro Nacional de Física da Matéria Condensada, Águas de Lindóia (Brazil), 11.–15.05.2009.

J. Kurde, J. Miguel, J. Sánchez-Barriga, D. Bayer, F. Kronast, L. Tati-Bismaths, M. Aeschlimann, H. A. Dürr, and W. Kuch

Time-resolved magnetization dynamics of single and tri-layered micro structures  
First Joint BER II and BESSY II Users Meeting, Berlin, 12.–13.11.2009.

J. Miguel, M. Piantek, A. Krüger, C. Navío, M. Bernien, D. Ball, K. Hermann, and W. Kuch  
Temperature, surface and coverage-induced conformational changes of azobenzene derivatives on Cu(001)

10th International Conference on Atomically Controlled Surfaces, Interfaces and Nanostructures, Granada (Spain), 21.–25.09.2009.

J. Miguel, M. Piantek, G. Schulze, K. Franke, A. Krüger, C. Navío, M. Bernien, W. Kuch, and J. I. Pascual

Ring Opening Reaction of Spiropyran on a Au(111) Surface  
First Joint BER II and BESSY II Users Meeting, Berlin, 12.–13.11.2009.

M. Á. Niño, J. Camarero, R. Abrudan, K. Fukumoto, T. O. Montes, A. Locatelli, W. Kuch, J. J. de Miguel, and R. Miranda

Magnetic behavior of metastable fcc FeCu alloy thin films grown with the aid of a surfactant Pb layer  
20th International Colloquium on Magnetic Films and Surfaces, Berlin, 20.–24.07.2009.

M. Á. Niño, J. Camarero, J. J. de Miguel, T. O. Montes, A. Locatelli, R. Abrudan, W. Kuch, and R. Miranda

Magnetic properties of artificial FeCu(111) alloy thin films  
International Conference on Magnetism, Karlsruhe, 26.–31.07.2009

M. Piantek, J. Miguel, A. Krüger, C. Navío, M. Bernien, D. Ball, K. Hermann, and W. Kuch  
Temperature, Surface and Coverage-Induced Conformational Changes of Azobenzene  
Derivatives on Cu(001)

26th European Conference on Surface Science, Parma (Italy), 30.08.–04.09.2009.

K. M. Seemann, M. C. Hickey, V. Baltz, J. Miguel, F. Kronast, W. Kuch, B. J. Hickey, and C.  
H. Marrows

High spin-polarization of diffusive currents in epitaxial  $L1_0$  FePt and FePd

20th International Colloquium on Magnetic Films and Surfaces, Berlin, 20.–24.07.2009.

M. Stampe, P. Stoll, T. Homberg, and W. Kuch

Thickness and composition dependence of the antiferromagnetic ordering temperature in  
 $Ni/Fe_xMn_{1-x}$  bilayers

20th International Colloquium on Magnetic Films and Surfaces, Berlin, 20.–24.07.2009.

#### **d) presentations for the public**

W. Kuch

Die Zukunft der magnetischen Datenspeicherung

Lange Nacht der Wissenschaften, Berlin, public talk at Fachbereich Physik der Freien  
Universität Berlin, 13.06.2009.

W. Kuch

Präsentation des Physikalischen Fortgeschrittenenpraktikums der Freien Universität Berlin  
Praktikumsleitertagung 2009, Berlin, 23.09.2009.

## **Degrees:**

Matthias Bernien

X-Ray Absorption Spectroscopy of Fe Complexes on Surfaces: Electronic Interactions and Tailoring of the Magnetic Coupling

PhD degree, Freie Universität Berlin, 28.10.2009.

Tabias Homberg

Wechselwirkung ultradünner ferromagnetischer/antiferromagnetischer Ni/FeMn-Schichten in Abhängigkeit der antiferromagnetischen Schichtdicke und Zusammensetzung

Diploma degree, Freie Universität Berlin, April 2009.

Alex Krüger

Röntgenspektroskopie photochromer Moleküle auf Oberflächen

Diploma degree, Freie Universität Berlin, April 2009.

Raphael Hellwig

Untersuchung der Ordnungstemperatur ultradünner ferro-/antiferromagnetischer Schichtsysteme

Bachelor degree, Freie Universität Berlin, May 2009.

Philip Rackow

Röntgenspektroskopie an Stickstoffmonoxid auf adsorbierten molekularen Schaltern

Bachelor degree, Freie Universität Berlin, September 2009.