

AG Kuch
Scientific Activity Report 2025

Scientists:

Awsaf, Chowdhury Shadman

Gördes, Jendrik

Grilli, Lorenzo

Kuch, Wolfgang

Schwank, Malte (from 07.07.)

Thakur, Sangeeta

Torres, Jorge (until 21.03.)

Walter, Marcel

Bachelor, Master, and Diploma students:

Heberer, Dennis (until 24.05.)

Kiyak, Süheyla (from 10.11.)

Klusmann, Mathis (22.04.–07.10.)

Kok, Zhen An (until 07.10.)

Yousaf, Fasil (from 25.04.)

Zenovic, Jasmin (until 07.05.)

Publications:

J. Gördes, I. Kumberg, C. S. Awsaf, M. Walter, T. Shinwari, S. Thakur, S. Sharma, C. Schüßler-Langeheine, N. Pontius, and W. Kuch
Accelerated ultrafast demagnetization of an interlayer-exchange-coupled Co/Mn/Co trilayer”
Phys. Rev. B **112**, 104442-1–7 (2025).

R. Hosseinifar, F. Steinbach, I. Kumberg, J. M. Lendínez, S. Thakur, S. E. Hadjadj, J. Gördes, C. S. Awsaf, M. Fix, M. Albrecht, F. Kronast, U. Atxitia, C. von Korff Schmising, and W. Kuch
All-optical magnetization switching of GdFe by double-pulse laser excitation
Phys. Rev. B **112**, 174406-1–10 (2025).

S. K. Mathialagan, S. O. Parreiras, J. Santos, C. Martín-Fuentes, D. Moreno, L. Černa, M. Tenorio, B. Muñiz-Cano, K. Lauwaet, M. Valvidares, M. A. Valbuena, J. I. Urgel, W. Kuch, P. Gargiani, R. Miranda, J. I. Martínez, J. M. Gallego, N. Martín, and D. Écija
Tailoring the Magnetic Properties of 2D Metal-Organic Networks by Harnessing the Coordination Sphere
Angew. Chem. Int. Ed. **64**, e202509199-1–8 (2025).

J. Torres, S. Thakur, S. Ossinger, I. Kumberg, E. Golias, C. W. A. Trommer, S. E. Hadjadj, M. Walter, J. Gördes, J. Grunwald, R. Hosseinifar, C. Luo, L. Kipgen, F. Radu, F. Tuczek, and W. Kuch
Mono- und submonolayer films of a high $T_{1/2}$ spin-crossover molecule on HOPG: temperature- and light-driven spin-state transition
J. Phys.: Condens. Matter **37**, 315001-1–13 (2025).

C. A. F. Vaz, G. van der Laan, S. A. Cavill, H. A. Dürr, A. Fraile Rodríguez, F. Kronast, W. Kuch, Ph. Saintavit, G. Schütz, H. Wende, E. Weschke, and F. Wilhelm
X-ray magnetic circular dichroism
Nat. Rev. Methods Primers **5**, 27-1–18 (2025).

M. Walter, S. E. Hadjadj, C. Trommer, J. Torres, J. Gördes, D. Swerev, T. Shinwari, C. Lotze, C. Luo, F. Radu, F. Tuczek, S. Thakur, and W. Kuch
Spin-Crossover in a Dinuclear Iron(II) Complex on Highly Oriented Pyrolytic Graphite: An X-ray Absorption Spectroscopy Study
ChemPhysChem **26**, e202401081-1–9 (2025).

M. Walter, E. F. Kuhleemann, T. Al Said, C. W. A. Trommer, F. Tuczek, K. Holldack, W. Kuch, and S. Thakur
Tracking the HS-HS, HS-LS, and LS-LS States in the Spin Transition of a Dinuclear Fe(II) Complex by Broadband FTIR Spectroscopy
J. Phys. Chem. Lett. **16**, 12675–12683 (2025).

Presentations:

a) invited talks

W. Kuch

Ultrafast magnetization dynamics in antiferromagnet/ferromagnet layered systems

National Taiwan University, Taipei, Taiwan, 01.04.2025.

W. Kuch, J. Gördes, I. Kumberg, C. S. Awsaf, M. Walter, T. Shinwari, S. Thakur, C.

Schüßler-Langeheine, N. Pontius, and S. Sharma

Accelerated ultrafast demagnetization of an interlayer-exchange-coupled Co/Mn/Co trilayer

14th Joint European Magnetic Symposia (JEMS2025), Frankfurt, Germany, 24.–29.08.2025.

b) contributed talks

M. Walter, S. E. Hadjadj, C. Trommer, J. Torres, J. Gördes, D. Swerev, Ch. Lotze, C. Luo, F.

Radu, F. Tuczek, S. Thakur, and W. Kuch

Thin films of a dinuclear Fe^{2+} complex on HOPG: Spin-crossover studies using X-ray absorption spectroscopy

DPG Spring Meeting of the Condensed Matter Section, Regensburg, Germany, 16.–21.03.2025.

J. Gördes, I. Kumberg, C. S. Awsaf, M. Walter, T. Shinwari, S. Thakur, S. Sharma, Ch.

Schüßler-Langeheine, N. Pontius, and W. Kuch

Accelerated ultrafast demagnetization of an interlayer-exchange-coupled Co/Mn/Co trilayer

DPG Spring Meeting of the Condensed Matter Section, Regensburg, Germany, 16.–21.03.2025.

c) posters

C. S. Awsaf, S. Thakur, M. Weißenhofer, J. Gördes, M. Walter, N. Pontius, Ch. Schüßler-Langeheine, P. Oppeneer, and W. Kuch

Element-resolved study of antiferromagnetic/ferromagnetic magnetization dynamics in epitaxial CoO/Fe bilayer

DPG Spring Meeting of the Condensed Matter Section, Regensburg, Germany, 16.–21.03.2025.

L. Grilli

X-ray spectroscopy of epitaxial two-dimensional van-der-Waals magnetic materials

2025 European School of Magnetism, Liège, Belgium, 30.06.–11.07.2025.

F. Yousaf, M. Walter, M. Klusmann, L. Grilli, Z. A. Kok, J. Gördes, C. S. Awsaf, E.

Kuhlemann, C. Luo, F. Radu, F. Tuczek, S. Thakur, and W. Kuch

Thin films and bulk material of an Fe^{2+} complex: Spin-crossover studies using X-ray absorption spectroscopy

17th BESSY@HZB User Meeting, Berlin, Germany, 03.–05.12.2025.

d) events for the public

D. Heberer and L. Grilli:

Eis im Winter und im Sommer

Workshop at Girl's Day, Fachbereich Physik der Freien Universität Berlin, 03.04.2025.

Degrees:

Heberer, Dennis

Untersuchung der laserinduzierten ultraschnellen Entmagnetisierung an einer FM/AFM Doppelschicht

Bachelor degree, Freie Universität Berlin, May 2025.

Hosseinifar, Rahil

Studying all-optical switching in GdFe using both single and double laser pulses

PhD degree, Freie Universität Berlin, 19.05.2025.

Klusmann, Mathis

Röntgenabsorptionsspektroskopie von Spin-Crossover-Komplexen

Bachelor degree, Freie Universität Berlin, October 2025.

Kok, Zhen An

Synthesis and Characterization of $\text{FeCl}_2/\text{Au}(111)$ and $\text{FeCl}_2/\text{Graphene}/6\text{H-SiC}(0001)$

Master degree, Freie Universität Berlin, October 2025.

Torres, Jorge

X-ray and Visible Light Spectroscopic Investigation of Spin-Crossover Molecules Deposited in Sub- and Mono-Layers on Solid Surfaces

PhD degree, Freie Universität Berlin, 08.12.2025.

Zenovic, Jasmin

Präparation und Charakterisierung von epitaktischen Fe/CoO-Doppelschichten auf Ag(001)

Bachelor degree, Freie Universität Berlin, May 2025.