

AG Kuch
Scientific Activity Report 2023

Scientists:

Awsaf, Chowdhury Shadman

Gelen, Ismet (until 30.04.)

Gördes, Jendrik

Hadjdaj, Sebastien

Hosseinfar, Rahil

Kuch, Wolfgang

Shinwari, Tauqir

Thakur, Sangeeta

Torres, Jorge

Walter, Marcel

Bachelor, Master, and Diploma students:

Li, Tingwei (since 01.11.)

Swerev, David (until 29.09.)

Talebachew, Biniyam (since 05.07.)

Publications:

J. Grunwald, J. Torres, A. Buchholz, Ch. Näther, L. Kämmerer, M. Gruber, S. Rohlf, S. Thakur, H. Wende, W. Plass, W. Kuch, and F. Tuzek

Defying the inverse energy gap law: a vacuum-evaporable Fe(II) low-spin complex with a long-lived LIESST state

Chem. Sci. **14**, 7361–1–20 (2023).

S. E. Hadjadj, C. González-Orellana, J. Lawrence, D. Bikaljević, M. Peña-Díaz, P. Gargiani, L. Aballe, J. Naumann, M. Á. Niño, M. Foerster, S. Ruiz-Gómez, S. Thakur, I. Kumberg, J. M. Taylor, J. Hayes, J. Torres, C. Luo, F. Radu, D. G. de Oteyza, W. Kuch, J. I. Pascual, C. Rogero, and M. Ilyn

Epitaxial Monolayers of the Magnetic 2D Semiconductor FeBr₂ Grown on Au(111)

Chem. Mater. **35**, 9847–9856 (2023).

I. Kumberg, E. Golias, S. Hadjadj, R. Hosseinifar, S. Thakur, T. Shinwari, I. Gelen, N. Pontius, C. Schüßler-Langeheine, C. von Korff Schmising, S. Sharma, and W. Kuch

Ultrafast laser-induced magneto-optical changes in resonant magnetic x-ray reflectivity

Phys. Rev. B **108**, 054439-1–10 (2023).

A. Manzoor, A. Shahzad, W. Kuch, T. Shinwari, I. Kumberg, Y. A. Shokr, and M. A. Khan
Microstructure, Ferromagnetic Resonance, and Electrical Analysis of Ho-substituted Li-Ni Nanoparticles

J. Alloys Compounds **968**, 172235-1–8 (2023).

A. Nefedov, C. Li, K. Müller, A. B. Kanj, L. Heinke, C. Luo, K. Chen, F. Radu, E. Golias, W. Kuch, and Ch. Wöll

Magnetic coupling of guest metallocene molecules with SURMOF-2 host matrix

Phys. Rev. B **107**, 054433-1–9 (2023).

T. Shinwari, I. Gelen, M. Villanueva, I. Kumberg, Y. A. Shokr, and W. Kuch

Growth, Structure, and Magnetic Properties of Artificially Layered NiMn in Contact to Ferromagnetic Co on Cu₃Au(001)

Phys. Status Solidi B **260**, 2200518-1–8 (2023).

A. Smekhova, A. Kuzmin, K. Siemensmeyer, C. Luo, J. Taylor, S. Thakur, F. Radu, E. Weschke, A. Guilherme Buzanich, B. Xiao, A. Savan, K. V. Yuseenko, and A. Ludwig

Local structure and magnetic properties of a nanocrystalline Mn-rich Cantor alloy thin film down to the atomic scale

Nano Res. **16**, 5626–5639 (2023).

Presentations:

a) talks

S. E. Hadjadj, C. Gonzalez-Orellana, J. Lawrence, D. Bikaljevic, M. Pena-Diaz, P. Gargiani, L. Aballe, J. Naumann, M. A. Nino, M. Foerster, S. Ruiz-Gomez, S. Thakur, I. Kumberg, J. Taylor, J. Hayes, J. Torres, C. Luo, F. Radu, D. G. de Oteyza, W. Kuch, J. I. Pascual, C. Rogero, and M. Ilyn

Structural and chemical characterization of epitaxially grown FeBr₂ on Au(111)

DPG Spring Meeting of the Condensed Matter Section, Dresden, Germany, 26.–31.03.2023.

S. Kerschbaumer, S. Hadjadj, A. Aguirre Baños, D. Longo, W. Kuch, J. I. Pascual, C. Rogero, and M. Ilyn

Monolayers of CoCl₂ and CoBr₂ on Au(111) – Chemical, magnetic and structural investigation

DPG Spring Meeting of the Condensed Matter Section, Dresden, Germany, 26.–31.03.2023.

W. Kuch, I. Kumberg, E. Golias, S. Hadjadj, R. Hosseinifar, S. Thakur, T. Shinwari, I. Gelen, N. Pontius, Ch. Schüßler-Langeheine, C. von Korff Schmising, and S. Sharma

Ultrafast Laser-Induced Magneto-Optical Changes in Resonant Magnetic X-Ray Reflectivity
13th Joint European Magnetic Symposia, Madrid, Spain, 27.08.–01.09.2023.

A. Nefedov, C. Li, K. Müller, A. B. Kanj, L. Heinke, C. Luo, K. Chen, F. Radu, E. Golias, W. Kuch, and Ch. Wöll

Magnetic coupling of guest metallocene molecules with SURMOF-2 host matrix

DPG Spring Meeting of the Condensed Matter Section, Dresden, Germany, 26.–31.03.2023.

S. O. Parreiras, C. Martín-Fuentes, J. I. Urgel, V. Rubio-Giménez, B. Muñoz-Cano, D.

Moreno, K. Lauwaet, M. Valvidares, M. A. Valbuena, P. Gargiani, W. Kuch, J. Camarero¹, J.

M. Gallego, R. Miranda, J. I. Martínez, C. Martí-Gastaldo, and D. Écija

Engineering of a 2D Metal-organic Network Featuring a Large Unquenched Orbital
Magnetic Moment

13th Joint European Magnetic Symposia, Madrid, Spain, 27.08.–01.09.2023.

J. Torres, J. Grunwald, S. Ossinger, S. Thakur, C. W. A. Trommer, M. Walter, I. Kumberg, R. Hosseinifar, E. Golias, S. Hadjaj, J. Gördes, P.-C. Liu, C. Luo, L. Kipgen, T. Shinwari, F. Radu, F. Tuzcek, and W. Kuch

Spin transition of spin-crossover molecules supported by tridentate ligands deposited on HOPG

DPG Spring Meeting of the Condensed Matter Section, Dresden, Germany, 26.–31.03.2023.

b) posters

S. E. Hadjadj, S. Kerschbaumer, A. Aguirre Banos, D. Longo, F. Choueikani, C. Rogero, J. I. Pascual, W. Kuch, and M. Ilyn

Magnetic properties of transition metal dihalides measured by x-ray magnetic circular dichroism (XMCD)

DPG Spring Meeting of the Condensed Matter Section, Dresden, Germany, 26.–31.03.2023.

J. Gördes, T. Gustafson, I. Gelen, S. Hadjadj, I. Kumberg, T. Shinwari, and W. Kuch
Magnetization dynamics in magnetic trilayers with a wedged antiferromagnetic spacer layer at ultrafast timescales

DPG Spring Meeting of the Condensed Matter Section, Dresden, Germany, 26.–31.03.2023.

R. Hosseinifar, I. Kumberg, F. Steinbach, S. Thakur, S. Hadjadj, J. Gördes, C. Awsaf, M. Fix, M. Albrecht, F. Kronast, C. von Korff Schmising, and W. Kuch

Dual-pulse-excitation all-optical switching of a $\text{Gd}_{26}\text{Fe}_{74}$ ferrimagnet

DPG Spring Meeting of the Condensed Matter Section, Dresden, Germany, 26.–31.03.2023.

W. Kuch, I. Kumberg, C. S. Awsaf, E. Golias, R. Hosseinifar, K. Frischmuth, I. Gelen, M. Walter, T. Shinwari, S. Thakur, N. Pontius, C. Schüßler-Langeheine, P. M. Oppeneer

Ultrafast magnetization dynamics in antiferromagnet/ferromagnet layered systems

Gordon Research Conference “Spin Dynamics in Nanostructures”, Les Diablerets, Switzerland, 09.–14.07.2023.

J. Torres, S. Thakur, I. Kumberg, E. Golias, S. Hadjaj, M. Walter, J. Gördes, R. Hosseinifar, P.-C. Liu, L. Kipgen, T. Shinwari, W. Kuch, S. Ossinger, J. Grunwald, C. W. A. Trommer, F. Tucek, C. Luo, K. Chen, and F. Radu

XAS measurements of tridentate spin-crossover molecules adsorbed on graphite

15th BESSY@HZB User Meeting, Berlin, Germany, 22.–23.06.2023.

c) events for the public

J. Gördes and R. Hosseinifar

Eis im Winter und im Sommer

Workshop at Girl's Day, Fachbereich Physik der Freien Universität Berlin, 27.04.2023.

Degrees:

Swerev, David

Studies of two dimensional van der Waals magnets

Master degree, Freie Universität Berlin, September 2023.

Gelen, Ismet

Magnetism and structure of $\text{Mn}_x\text{Au}_{1-x}$ on Cu(001) and Ag(001)

PhD degree, Freie Universität Berlin, 17.04.2023.