

AG Kuch
Scientific Activity Report 2022

Scientists:

Awsaf, Chowdhury Shadman (since 01.09.)

Gelen, Ismet

Gördes, Jendrik

Hadjdaj, Sebastien

Hosseinifar, Rahil

Kuch, Wolfgang

Kumberg, Ivar (until 31.10.)

Shinwari, Tauqir

Thakur, Sangeeta

Torres, Jorge

Walter, Marcel

Bachelor, Master, and Diploma students:

Awsaf, Chowdhury Shadman (until 25.03.)

Gustafson, Travis (until 19.04.)

Liu, Pin-Chi (until 05.07.)

Swerev, David (since 19.04.)

Publications:

R. Hosseinifar, E. Golias, I. Kumberg, Q. Guillet, K. Frischmuth, S. Thakur, M. Fix, M. Albrecht, F. Kronast, and W. Kuch

Influence of magnetic domain walls on all-optical magnetic toggle switching in a ferrimagnetic GdFe film

Beilstein J. Nanotechnol. **13**, 74–81 (2022).

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

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

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

On-surface design of a 2D cobalt-organic network preserving large orbital magnetic moment

J. Am. Chem. Soc. **144**, 16034–16041 (2022).

Presentations:

a) invited talks

W. Kuch

Ultrafast spin transfer in layered magnetic heterostructures
INESC MN 2022 Seminar Series, Lisbon, Portugal, 25.02.2022 (online).

W. Kuch

Ultrafast spin transfer in layered magnetic heterostructures
Instituto Madrileño de Estudios Avanzados (IMDEA) Nanotecnología, Madrid, Spain,
31.05.2022.

W. Kuch

Ultrafast spin transfer in layered magnetic heterostructures
7th Edition of the International Workshop on Materials Physics “Recent Trends in Magnetism and Superconductivity”, National Institute of Materials Physics, Magurele, Romania, 31.08.–02.09.2022,

S. Thakur

Thermal- and light-induced switching of spin-crossover complexes by XAS
Conference “LEAPS meets Quantum Technology”, Elba, Italy, 15.–20.05.2022.

b) contributed talks

R. Hosseinifar, I. Kumberg, E. Golias, S. Thakur, S. Hadjadj, J. Gördes, K. Frischmuth, J. Torres, F. Kronast, M. Fix, M. Albrecht, and W. Kuch
Studying all-optical-switching in ferrimagnetic Gd₂₆Fe₇₄ alloy with single and dual ultra-fast laser pulses
The 12th International Conference on LEEM/PEEM, Córdoba, Spain, 26.–30.09.2022.

W. Kuch, E. Golias, I. Kumberg, I. Gelen, S. Thakur, J. Gördes, R. Hosseinifar, Q. Guillet, J. K. Dewhurst, S. Sharma, C. Schüßler-Langeheine, and N. Pontius
Ultrafast Optically Induced Ferromagnetic State in an Elemental Antiferromagnet
The Joint European Magnetic Symposia (JEMS 2022), Warsaw, Poland and online, talk given in Warsaw, 24.–29.07.2022.

I. Kumberg, E. Golias, I. Gelen, S. Thakur, J. Goerdes, R. Hosseinifar, Q. Guillet, J. K. Dewhurst, S. Sharma, C. Schuessler-Langeheine, N. Pontius, and W. Kuch
Ultrafast Optically Induced Ferromagnetic State in an Elemental Antiferromagnet
24th International Colloquium on Magnetic Films and Surfaces (ICMFS-2022), Okinawa, Japan and online, talk given online, 10.–15.07.2022.

c) posters

J. Gördes, T. Gustafson, I. Gelen, S. Hadjadj, I. Kumberg, T. Shinwari, and W. Kuch
Co-evaporation of Mn_{1-x}Au_x on a Nb(100) substrate capped with a pseudomorphic Au layer
Trends in Magnetism (TMAG), Venice, Italy, 04.–09-09-2022.

S. E. Hadjadj, E. Golias, J. Hayes, M. Walter, C. Lotze, S. Thakur, I. Kumberg, I. Gelen, J. Torres, and W. Kuch
Growth and characterization of monolayer MnSe₂ on Au(111)
DPG Spring Meeting of the Condensed Matter Section, Regensburg, Germany, 04.–09.09.2022.

R. Hosseinifar, I. Kumberg, S. Thakur, E. Golias, S. Hadjadj, J. Gördes, J. Torres, F. Kronast, M. Fix, M. Albrecht, and W. Kuch
Studying double pulse toggle switching of GdFe
DPG Spring Meeting of the Condensed Matter Section, Regensburg, Germany, 04.–09.09.2022.

J. Torres, J. Grunwald, S. Thakur, S. Ossinger, M. Walter, C. W. A. Trommer, I. Kumberg, R. Hosseinifar, E. Golias, P.-C. Liu, S. Hadjadj, J. Gördes, L. Kipgen, C. Luo, K. Chen, F. Radu, F. Tuczek, and W. Kuch
Study of spin-crossover molecules by X-ray absorption spectroscopy and differential reflectance spectroscopy and their spectral simulations
8th European Conference on Molecular Magnetism, Rennes, France, 04.–07.07.2022.

J. Torres, L. Kipgen, S. Ossinger, S. Thakur, C. W. A. Trommer, I. Kumberg, R. Hosseinifar, E. Golias, S. Hadjadj, J. Gördes, C. Luo, K. Chen, F. Radu, F. Tuczek, and W. Kuch
Room-Temperature Presence of High-Spin State in Spin-Crossover Molecule Thin Layers on Graphite Measured by X-Ray Absorption Spectroscopy
German Conference for Research with Synchrotron Radiation, Neutrons and Ion Beams at Large Facilities (SNI2022), Berlin, Germany, 05.–09.09.2022.

J. Torres, S. Ossinger, S. Thakur, C. W. A. Trommer, M. Walter, I. Kumberg, R. Hosseinifar, E. Golias, S. Hadjadj, J. Gördes, P.-C. Liu, C. Luo, L. Kipgen, T. Shinwari, F. Radu, F. Tuczek, and Wolfgang Kuch
X-ray absorption and differential reflectance spectroscopies of spin-crossover molecules on HOPG
DPG Spring Meeting of the Condensed Matter Section, Regensburg, Germany, 04.–09.09.2022.

C. Trommer, M. Walter, S. Thakur, W. Kuch, and F. Tuczek
Spin Crossover in Binuclear Bisbipyridine-Bridged Iron(II) Complexes
21st Conference on Inorganic Chemistry, Marburg, Germany, 26.–28.09.2022.

M. Walter, S. Thakur, C. Trommer, F. Tuczek, S. E. Hadjadj, J. Torres, and W. Kuch
Comparison of spin-crossover properties between thin film and bulk sample of a binuclear Fe(II) complex
DPG Spring Meeting of the Condensed Matter Section, Regensburg, Germany, 04.–09.09.2022.

M. Walter, S. Thakur, C. W. A. Trommer, F. Tuczek, C. Luo, F. Radu, S. E. Hadjadj, J. Torres, T. Shinwari, D. Swerev, and W. Kuch
Comparison of spin-crossover properties between thin film and bulk sample of a binuclear Fe(II) complex
14th BESSY@HZB User Meeting, online, 08.12.2022.

Degrees:

Awsaf, Chowdhury Shadman

Laser induced ultrafast magnetisation dynamics of FM/AFM bilayer and FM/AFM/FM trilayer samples

Master degree, Freie Universität Berlin, March 2022.

Ghaderi, Sakineh

Resonant soft X-ray reflectivity study of [Mn/Co] magnetic heterostructures

Master degree, Freie Universität Berlin, May 2022.

Gustafson, Travis

Preparation and analysis of antiferromagnetic Fe/Mn thin film bilayer on Ag(100) substrate

Master degree, Freie Universität Berlin, April 2022.

Kumberg, Ivar

Ultrafast demagnetization in metallic ferromagnetic/antiferromagnetic heterostructures

PhD degree, Freie Universität Berlin, 11.11.2022.

Liu, Pin-Chi

X-ray and visible-light spectroscopies on spin-crossover and photochromic molecules

Master degree, Freie Universität Berlin, July 2022.

Shinwari, Tauqir

Fundamental Aspects of the Exchange Bias Effect in $\text{Ni}_x\text{Mn}_{100-x}/(\text{Ni}/\text{Co})$ Bilayers, Trilayers and Multilayers on $\text{Cu}_3\text{Au}(001)$

PhD degree, Freie Universität Berlin, 09.02.2022.