MSM22

12th International Conference on Magnetic and Superconducting Materials

University of Duisburg-Essen, Faculty of Physics
August 28 – September 2, 2022

Program Book

Supported by:

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CENTER FOR NANOINTEGRATION DUISBURG-ESSEN

IUPAP

WELCOME MESSAGE

On behalf of the Committees of the 12th International Conference on Magnetic and Superconducting Materials MSM22, we are pleased to welcome you all at the Faculty of Physics, University of Duisburg-Essen from August 28 to September 2, 2022.

The 12th edition of MSM conferences will continue the series of meetings started in 1999 as an international conference with the objective of strengthening scientific relations between the scientific groups in the middle eastern region and the advanced world scientific community. Since then, the MSM meetings became a biennial event held in Asia, Africa and Europe, finally reaching the heart of western Europe, Duisburg, in 2022 - after a one-year delay due to the worldwide Corona pandemic. The program of MSM22 covers the latest advances in fundamental and applied magnetism and superconductivity as well as many related topics. The MSM22 brings together leading international research groups from the western and eastern world and provides a great in-person atmosphere for discussion of results and exchange of ideas keeping the best historic traditions and high scientific quality of MSM conferences.

The scientific Program of MSM22 offers a broad range of plenary and invited talks with contributed oral and poster presentations. We especially thank all authors and presenters for making an exciting scientific program of MSM22 possible with their contributions, and we appreciate suggestions and efforts of all members of the Organizing Committees. A special THANK YOU goes to the members of the Local Organizing Committee for their hard work in organization of this meeting.

We are delighted to host the 12th MSM conference and welcome all of you in Duisburg, a city in the western part of the Ruhr Area in North Rhine-Westphalia, Germany. Numerous lakes, canals and ports dominating the landscape of the city make it one of the most water-abundant cities in Germany. The “Ruhrgebiet” in Germany is famous for being a center of contrast – urban architecture meets extensive nature, harbors and waterfronts meet industrial culture, relaxing retreats meet interesting historical monuments. Being right in the heart of this region, Duisburg offers visitors to explore the “city of water and fire” and to enjoy the flair of the “Ruhrgebiet” (Ruhr area) with the relaxed atmosphere of the Lower Rhine.

Please join and enjoy the 12th MSM meeting with your colleagues and friends. We are looking forward to welcoming you in Duisburg for a memorable and exciting conference!

Michael Farle
MSM22 Chair

Anna Semisalova
MSM22 co-chair

Faculty of Physics, University of Duisburg-Essen

OVERVIEW

The MSM conference has been initiated as a regional scientific meeting on properties and applications of magnetic and superconducting materials in 1999 in Tehran (Iran) to gather scientists from middle eastern region with the advanced world scientific community. Being called at that time as "a First World Conference in a Third World Country", first MSM meeting has been continued with co-chairmanship of Prof. Mohammad Akhavan for a total of 11 subsequent conferences organized in many countries across Asia, Africa and Europe with the most recent MSM19 held in Seoul and chaired by Prof. Kee Hoon Kim (Seoul National University). We are pleased to continue the series of MSM conferences and host the 12th MSM22 in Duisburg for the first time. We are committed to a further development of MSM as one of the foremost international conferences on magnetism and superconductivity which brings together regional and international groups of scientists and technologists for an open discussion of the most recent results and ideas.

- 1st **MSM99** - Tehran, Iran, September 27-30, 1999
- 2nd **MSM01** - Irbid, Jordan, September 9-13, 2001
- 3rd **MSM03** - Tunisia, September 1-4, 2003
- 4th **MSM05** - Morocco, September 5-8, 2005
- 5th **MSM07** - Khiva, Uzbekistan, September 25-30, 2007
- 6th **MSM09** - Kolkata, India, November 11-14, 2009
- 7th **MSM11** - Selangor, Malaysia, October 11-13, 2011
- 8th **MSM13** - Sfax, Tunisia, September 2-5, 2013
- 9th **MSM15** - Antalya, Turkey, April 30-May 3, 2015
- 10th **MSM17** - Tehran, Iran, September 18-21, 2017
- 11th **MSM19** - Seoul, South Korea, August 17-24, 2019

Title	12th International Conference on Magnetic and Superconducting Materials (MSM22)
Date	August 28 (Sunday) – September 2 (Friday), 2022
Location	Faculty of Physics, University of Duisburg-Essen Lotharstrasse 1, 47057 Duisburg Campus MC
Supported by	University of Duisburg-Essen UDE Center for Nanointegration Duisburg-Essen CENIDE The International Union of Pure and Applied Physics IUPAP CRC/TRR 270 - Hysteresis design of magnetic materials for efficient energy conversion HoMMage
Website	https://www.uni-due.de/msm22/

CONFERENCE ORGANIZERS

Prof. Dr. Michael Farle (chair) - University of Duisburg-Essen, Faculty of Physics

Dr. Anna Semisalova - University of Duisburg-Essen, Faculty of Physics

Local organizing committee

Ms. Inci Nur Sahin (B.Sc. Nanoeng.)

Ms. Sakia Sophia Noorzayee (B.Sc. Physics)

Ms. Tatiana Smoliarova (M.Sc. Physics)

Dr. Marina Spasova

Prof. Ulf Wiedwald

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Prof. Sergei Ovchinnikov, Russia

Prof. Rossitza Pentcheva, Germany

Prof. Warren E. Pickett, USA

Dr. Marina Spasova, Germany

Prof. Ulf Wiedwald, Germany

PD Dr. Khalil Zakeri, Germany

Conference location

University of Duisburg-Essen, Campus Duisburg, M area
Lotharstrasse 1, 47057, Duisburg

Directions:

From DUS Airport to Duisburg central station to University Campus

Duisburg central station (Duisburg Hbf) can be reached from Düsseldorf Airport Station by train, within 10 minutes, whereas a train departs every 10 minutes. The following trains can be used:

RE1, RE2, RE3, RE5, RE6, RE11, RE19, S1

From Duisburg central station Hbf to University Campus

From Duisburg Hbf, the M area of Duisburg campus can be easily reached by tram in less than 10 minutes, by bus in 15 minutes, by taxi in 10 minutes, or by walking (2.2 km).

Transport option	Start	Stop	Duration	Price
Tram 901	Duisburg Hbf	Uni/Zoo	<10	Ticket K (1,80€)
Bus 933	Duisburg Hbf	Uni Nord	15	Ticket A2 (2,90€)
Bus 926	Duisburg Hbf	Uni Nord or Uni Nord/Lotharstrasse	15	Ticket A2 (2,90€)
Taxi	Duisburg Hbf	Address: Lotharstrasse 1, 47057, Duisburg	10	10-15€

The map below shows the M area of the university campus and mentioned public transport stops.

USEFUL TIPS

Lunch

Coupons for lunch in faculty canteen (Mensa) are included in the participant set.

Don't forget to bring your name badge and your lunch coupons. If you don't use your lunch coupons, please return them to the registration desk.

When

MON-FRI	Aug 29 – Sept 2	12:00-14:00

Abstract e-Book

You can download electronic version of Abstract Book from the website www.uni-due.de/msm22/

Coffee

Fresh coffee and tea will be served during the break times (30 min).

When

MON	Aug 29	9:30, 13:30, 16:20
TUE	Aug 30	9:30, 13:30, 16:20
WEN	Aug 31	9:30, 13:30
THU	Sept 1	9:30, 13:30, 16:00
FRI	Sept 2	9:30

Restaurants nearby

PROGRAM AT A GLANCE

<table>
<tr><th>Sunday, August 28</th><th colspan="2">Monday, August 29</th><th colspan="2">Tuesday, August 30</th></tr>
<tr><td rowspan="20"></td><td colspan="2">8.00-8.30 Registration</td><td colspan="2"></td></tr>
<tr><td colspan="2">8.30 – 8.40 MD162
Opening
8.40 – 9.30 MD162
Oliver Gutfleisch</td><td colspan="2" rowspan="2">8.30 – 9.30 MD162
Sadamichi Maekawa</td></tr>
<tr><td colspan="2">9.30 – 10.00 Coffee break</td></tr>
<tr><td colspan="2">9.30 – 10.00 Coffee break</td></tr>
<tr><td>Magnetism MD162</td><td>Superconductivity MC122</td><td>Magnetism MD162</td><td>Superconductivity MC122</td></tr>
<tr><td rowspan="2">10.00 – 10.40
Ilya Sochnikov</td><td rowspan="2">10.00 – 10.40
Katharina Franke</td><td>10.00 – 10.20
Vladimir Sokolovskiy</td><td rowspan="2">10.00 – 10.40
Annica Black-Schaffer</td></tr>
<tr><td>10.20 – 10.40
Danil Baigutlin</td></tr>
<tr><td>10.40 – 11.00
Soohyeon Shin</td><td>10.40-11.00
Lisa Rütten</td><td>10.40 – 11.00
Olga Miroshkina</td><td rowspan="2">10.40 – 11.20
Anna Böhmer</td></tr>
<tr><td>11.00 – 11.20
Okan Koeksal</td><td rowspan="2">11.00 – 11.40
Warren Pickett</td><td>11.00 – 11.20
Elvina Dilmieva</td></tr>
<tr><td>11.20 – 11.40
Peter Kratzer</td><td>11.20 – 11.40
Mane Sahakyan</td><td>11.20 – 11.40
Martina Trahms</td></tr>
<tr><td>11.40 – 12.00
Yadhu Krishnan Edathumkandy</td><td>11.40 – 12.00
withdrawal</td><td>11.40 – 12.00
Mike J. Bruckhoff</td><td>11.40 – 12.00
Suraina Gupta</td></tr>
<tr><td colspan="2" rowspan="2">12.00 – 14.00 Lunch (MM)</td><td>12.00 – 12.20
Vasily Buchelnikov</td><td rowspan="2"></td></tr>
<tr><td colspan="2" rowspan="2">12.00 – 14.00 Lunch (MM)
13.30 – 14.00 Coffee break</td></tr>
<tr><td colspan="2">13.30 – 14.00 Coffee break</td></tr>
<tr><td colspan="2">14.00 – 15.00 MD162
Jingsheng Chen</td><td colspan="2">14.00 – 15.00 MD162
Aurélien Manchon</td></tr>
<tr><td rowspan="8">15.00-19.00
Registration

Foyer MD162/MC122</td><td>Magnetism MD162</td><td>Superconductivity MC122</td><td>Magnetism MD162</td><td>Superconductivity MC122</td></tr>
<tr><td>15.00 – 15.40
Hari Srikanth</td><td>15.00 – 15.40
Elena Gati</td><td>15.00 – 15.40
A. Fernández-Pacheco</td><td>15.00 – 15.40
Bohm Jung Yang</td></tr>
<tr><td rowspan="2">15.40 – 16.20
Vasily Temnov</td><td rowspan="2">15.40 – 16.20
Cedomir Petrovic</td><td>15.40 – 16.00
K. Everschor-Sitte</td><td rowspan="2">15.40 – 16.20
Wei Ku</td></tr>
<tr><td>16.00 – 16.20
Nikolai Kiselev</td></tr>
<tr><td colspan="2">16.20 – 16.50 Coffee break</td><td colspan="2">16.20 – 16.50 Coffee break</td></tr>
<tr><td>Magnetism MD162</td><td>Superconductivity MC122</td><td colspan="2">Magnetism MD162</td></tr>
<tr><td>16.50 – 17.10
Ilya Razdolsky</td><td rowspan="2">16.50 – 17.30
M.R. Mohammadizadeh</td><td colspan="2" rowspan="2">16.50– 17.50
Prof. Michael Flatte</td></tr>
<tr><td rowspan="4">17.00-19.00
Welcome reception

Foyer
MD162/MC122</td><td>17.10 – 17.30
Kjetil M. D. Hals</td></tr>
<tr><td>17.30 – 17.50
Jonas Wiemeler</td><td>17.30 – 17.50
Safarali Dzhumanov</td><td colspan="2">17.50 – 18.10
Andrii Savchenko</td></tr>
<tr><td>17.50 – 18.10
withdrawal</td><td>17.50 – 18.10
withdrawal</td><td colspan="2">18.10 – 18.30
Sebastian A. Diaz</td></tr>
<tr><td colspan="2" rowspan="2">17.50 – 19.20
Poster session</td><td colspan="2">18.30 – 18.50
David Ramos-Salamanca</td></tr>
</table>

Plenary talk Invited talk

Wednesday, August 31		Thursday, September 1		Friday, September 2
8.30 – 9.30 MD162 Ilya Eremin		8.30 – 9.30 MD162 Harold Hwang		8.30 – 9.30 MD162 Andrei Rogalev
9.30 – 10.00 Coffee break		9.30 – 10.00 Coffee break		9.30 – 10.00 Coffee break
Magnetism MD162	Superconductivity MC122	Magnetism MD162	Superconductivity MC122	Magnetism MD162
10.00 – 10.20 Robin Msiska	10.00 – 10.40 Wulf Wulfhekel	10.00 – 10.20 Natalia Shkodich	10.00 – 10.40 Dr. Frank Lechermann	10.00 – 10.40 Can Onur Avci
10.20 – 10.40 Liz Margarita Montañez Huamán		10.20 – 10.40 Asli Cakir		
10.40 – 11.00 Thomas Feggeler	10.40 – 11.20 Bernhard Holzapfel	10.40 – 11.00 Nicolas Josten	10.40 – 11.20 Benjamin Geisler	10.40 – 11.00 Umut Parlak
11.00 – 11.20 Hongyan Chen		11.00 – 11.20 Sakia Noorzayee		11.00 – 11.20 Raghvendra Singh Yadav
11.20 – 11.40 Manuel Gruber	11.20 – 12.00 Ming Yi	11.20 – 11.40 Mikel Quintana	11.20 – 12.00 Mohammad Akhavan	11.20 – 11.40 Andrea Ehrmann
11.40 – 12.00 Natallia Poddubnaya		11.40 – 12.00 Nikita Polin		11.40 – 12.00 Raphael Kriegl
12.00 – 14.00 Lunch (MM)		12.00 – 14.00 Lunch (MM)		12.00 – 12.15 Closing ceremony
13.30 – 14.00 Coffee break		13.30 – 14.00 Coffee break		12.15 – 14.00 Lunch (MM)
14.00 – 14.40 MD162 Pascal Malkemper		Magnetism MD162		
		14.00 – 14.40 Cornelia Monzel		
14.45 – 18.00 Excursion to Villa Hügel		14.40 – 15.20 Mariia Efremova		
		15.20 – 15.40 Konstantinos Simeonidis		
		15.40 – 16.00 Antonios Makridis		
		16.00 – 16.30 Coffee break		
		Magnetism MD162		
		16.30– 17.10 Makis Angelakeris		
		17.10 – 17.30 Kyriaki Kalaitzidou		
		17.30 – 17.50 Eirini Myrovali		
Conference dinner		17.50 – 18.10 Narek Sisakyan		
Laura H. Greene				

Special talk Contributed talks Magnetism/Superconductivity

Program schedule

August 28 / Sunday

15.00 – 19.00	Registration Foyer MD162/MC122
17.00 – 19.00	Welcome party Foyer MD162/MC122

August 29 / Monday

8.00 – 8.30	Registration Foyer MD162/MC122	
8.30 – 8.40	Opening ceremony MD162	
8.40 – 9.30	**Plenary talk:** **Prof. Oliver Gutfleisch** – *Technical University of Darmstadt, Germany* Advanced magnetic materials for efficient energy, transport and cooling applications Chair: Prof. Michael Farle MD162	
9.30 – 10.00	Coffee break	
10.00 – 12.00	Conference section: Magnetism Chair: Prof. Kjetil Hals MD162	Conference section: Superconductivity Chair: Prof. Laura H. Greene MC122
10.00 – 10.20	**Invited talk:** **Prof. Ilya Sochnikov** – *University of Connecticut, United States*	**Invited talk:** **Prof. Katharina Franke** – *Free University of Berlin, Germany*
10.20 – 10.40	Tunable magnetic domains and walls in a noncentrosymmetric ferromagnetic Weyl semimetal	Quantum spins and hybridization in artificially-constructed chains of magnetic adatoms on superconducting 2H-$NbSe_2$

10.40 – 11.00	**Dr. Soohyeon Shin** – *Paul Scherrer Institute, Switzerland* Magnetic hedgehog structure in a magnetically frustrated Kondo-lattice $CePtAl_4Ge_2$	**Lisa Marie Rütten** – *Free University of Berlin, Germany* Yu-Shiba-Rusinov states of Fe dimers on 2H-$NbSe_2$
11.00 – 11.20	**Dr. Okan Koeksal** – *University Duisburg-Essen, Germany* Chern and Z2 topological insulating phases in perovskite-derived oxide honeycomb lattices	**Invited talk:** **Prof. Warren Pickett** – *University of California Davis, United States of America* Non-symmorphic band sticking in a topological superconductor
11.20 – 11.40	**Prof. Peter Kratzer** – *University Duisburg-Essen, Germany* Ab initio study of spin-spin and spin-lattice couplings in two-dimensional Ising antiferromagnet $FePS_3$	
11.40 – 12.00	**Yadhu Krishnan Edathumkandy** – *Institute of Physics, Polish Academy of Sciences, Poland* Comparative study of magnetic properties of Mn^{3+} magnetic clusters in GaN using classical and quantum mechanical approach	*withdrawal*
12.00 – 14.00	Lunch Coffee break	
14.00 – 15.00	**Special talk:** **Prof. Jingsheng Chen** – *National University of Singapore, Singapore* Symmetry breaking by materials engineering for spin-orbit-torque technology Chair: Prof. Michael Farle MD162	

15.00 – 16.20	Conference section: Magnetism Chair: Prof. Michael Flatte MD162	Conference section: Superconductivity Chair: Prof. Warren Pickett MC122
15.00 – 15.40	**Invited talk:** **Prof. Hari Srikanth** – *University of South Florida, United States of America* Thermally induced spin transport and magnon propagation length in garnet heterostructures	**Invited talk:** **Dr. Elena Gati** – *Max-Planck Institute for Chemical Physics of Solids, Germany* Effect of uniaxial and hydrostatic pressure on competing phases in iron-based superconductors
15.40 – 16.20	**Invited talk:** **Prof. Vasily Temnov** – *CNRS, Ecole Polytechnique, France* Recent progress in ultrafast magneto-acoustics	**Invited talk:** **Dr. Cedomir Petrovic** – *Brookhaven National Laboratory, United States of America* Disorder in $FeSe_{1-x}S_x$ ($0 \leq x \leq 1$) superconducting crystals
16.20 – 16.50	Coffee break	
16.50 – 17.50	Conference section: Magnetism Chair: Prof. Jingsheng Chen MD162	Conference section: Superconductivity Chair: Prof. Warren Pickett MC122
16.50 – 17.10	**Dr. Ilya Razdolski** – *University of Bialystok, Poland* Inverse magneto-plasmonics for laser-induced spin dynamics	**Invited talk:** **Prof. Mohammad Reza Mohammadizadeh** – *University of Tehran, Iran* Hydrogen in metal/metal oxide hydrides
17.10 – 17.30	**Prof. Kjetil M. D. Hals** – *University of Agder, Norway* Spin-wave driven bidirectional domain wall motion in kagome antiferromagnets	
17.30 – 17.50	**Jonas Wiemeler** – *University of Duisburg-Essen, Germany* Ferromagnetic resonance study of spin pumping in epitaxial Fe/Rh bilayers	**Prof. Safarali Dzhumanov** – *Institute of nuclear physics, Uzbek Academy of Sciences, Uzbekistan* Two distinct possibilities of realizing room-temperature superconductivity in high-Tc cuprates and high pressure hydrides

17.50 – 18.10	*withdrawal*	*withdrawal*
17.50 – 19.20	Poster session Chair: Dr. Anna Semisalova	

August 30 / Tuesday

8.30 – 9.30	**Plenary talk:** **Prof. Sadamichi Maekawa** - *RIKEN, Japan* Spin Current in Superconductor/Ferromagnet Heterostructures Chair: Prof. Michael Farle MD162	
9.30 – 10.00	Coffee break	
10.00 – 12.20	Conference section: Magnetism Chair: PD Dr. Markus Gruner MD162	Conference section: Superconductivity Chair: Prof. Ilya Eremin MC122
10.00 – 10.20	**Dr. Vladimir Sokolovskiy** – *Chelyabinsk State University, Russian Federation* Competition of crystal structure motives in Heusler alloys Fe_2NiZ (Z = Al, Ga, In, Sn) and its influence on phase stability and ground state properties	**Invited talk:** **Prof. Annica Black-Schaffer** – *Uppsala University, Sweden* Nematic d-wave superconductivity in magic-angle twisted bilayer graphene from atomistic modeling
10.20 – 10.40	**Danil Baigutlin** – *Chelyabinsk State University, Russian Federation* Ab initio study of the 4d Heusler alloy Rh_2FeZ	

10.40 – 11.00	**Dr. Olga Miroshkina** – *University of Duisburg-Essen, Germany* Tuning of the effective magnetic decoupling in Ni-Mn-(In,Sn) Heusler alloys	**Invited talk:** **Prof. Anna Böhmer** – *Ruhr-University Bochum, Germany* Nematicity in unusual iron-based superconductors
11.00 – 11.20	**Dr. Elvina Dilmieva** – *European Synchrotron Radiation Facility, France* Metamagnetism and magnetocaloric effect: case study of Au_2Mn	
11.20 – 11.40	**Dr. Mane Sahakyan** – *Institute of Low Temperature and Structure Research, Poland* The study of electronic structure and magnetic properties of selected U-based intermetallics from the first-principles	**Martina Trahms** – *Free University of Berlin, Germany* Non-reciprocity in current-biased Josephson junctions in the presence of Yu-Shiba-Rusinov bound states
11.40 – 12.00	**Mike Jos Bruckhoff** – *University of Duisburg-Essen, Germany* Non-collinear spin reorientation in FeRh from first principles: Ultrafast laser-quenching vs. coherent rotation of Fe moments	**Suraina Gupta** – *Indian Institute of Technology Kanpur, India* Superconductor-Insulator transition in Lead-Graphene Hybrid system
12.00 – 12.20	**Prof. Vasily Buchelnikov** – *Chelyabinsk State University, Russian Federation* The influence of exchange correlation functional on the properties of Mn_2V(Al,Si) Heusler alloys	
12.20 – 14.00	Lunch Coffee break	
14.00 – 15.00	**Special talk:** **Prof. Aurélien Manchon** – *Aix-Marseille University, France* Exploring the potentials of spin-orbitronics Chair: Dr. Anna Semisalova MD162	

15.00 – 16.20	Conference section: Magnetism Chair: Dr. Thomas Feggeler MD162	Conference section: Superconductivity Chair: Prof. Mohammad Reza Mohammadizadeh MC122
15.00 – 15.40	**Invited talk:** **Dr. Amalio Fernández-Pacheco** – *Aragon Institute for Engineering Research, Spain* Geometrical effects in three-dimensional magnetic and superconductor circuits	**Invited talk:** **Prof. Bohm Jung Yang** – *Seoul National University, Korea, Republic of (South Korea)* Correlated normal state fermiology and topological superconductivity in UTe_2
15.40 – 16.00	**Prof. Karin Everschor-Sitte** – *University of Duisburg-Essen, Germany* Topological magnetic structures and their dynamics	**Invited talk:** **Prof. Wei Ku** – *Tsung-Dao Lee Institute, Shanghai Jiao Tong University, China* Superfluid and non-superfluid properties of emergent Bose liquid: Exotic transport and optical properties resembling unconventional superconductors
16.00 – 16.20	**Dr. Nikolai Kiselev** – *Forschungszentrum Jülich, Germany* Magnetic skyrmion braids and antiskyrmions in cubic chiral magnets	
16.20 – 16.50	Coffee break	
16.50 – 17.50	**Plenary talk:** **Prof. Michael Flatte** – *University of Iowa, United States of America* Coherent magnonics for quantum information science Chair: Prof. Vasily Temnov MD162	
17.50 – 18.50	Conference section: Magnetism Chair: Dr. Nikolai Kiselev MD162	
17.50 – 18.10	**Dr. Andrii Savchenko** – *Peter Grünberg Institute and Institute for Advanced Simulation, Forschungszentrum Jülich, Germany* Spin-wave resonance modes in 3D skyrmion lattice	

18.10 – 18.30	**Dr. Sebastián Alejandro Díaz Santiago** – *University of Duisburg-Essen, Germany* Steering Majorana braiding via skyrmion-vortex pairs: a scalable platform
18.30 – 18.50	**David Leonardo Ramos-Salamanca** – *Industrial University of Santander, Colombia* Stability of antiferromagnetic skyrmions

August 31 / Wednesday

8.30 – 9.30	**Plenary talk:** **Prof. Ilya Eremin** – *Ruhr University Bochum, Germany* Magnetic skyrmionic textures in proximity to a superconductor: vortex-skyrmion interaction, Meissner currents, and charge/spin supercurrentls Chair: Prof. Mohammad Akhavan MD162	
9.30 – 10.00	Coffee break	
10.00 – 12.00	Conference section: Magnetism Chair: Prof. Hari Srikanth MD162	Conference section: Superconductivity Chair: Prof. Karin Everschor-Sitte MC122
10.00 – 10.20	**Robin Msiska** – *University of Duisburg-Essen, Germany* Audio recognition with skyrmion mixture reservoirs	**Invited talk:** **Prof. Wulf Wulfhekel** – *Karlsruhe Institute of Technology, Germany* Is lead really a prototypical type I superconductor? New results on the phase diagram at ultra-low temperatures
10.20 – 10.40	**Dr. Liz Margarita Montanez Huaman** – *Forschungszentrum Jülich GmbH, Germany* Magnetic domains in $[Pt/Co/Ta]_{10}$ multilayers	

10.40 – 11.00	**Dr. Thomas Feggeler** – *Lawrence Berkeley National Laboratory, United States of America* Element-specific, spatially and time resolved observation of different phasic magnetic resonances of Fe_3O_4 nanoparticle ensembles in a bacterium *Magnetospirillum Magnetotacticum*	**Invited talk:** **Prof. Bernhard Holzapfel** – *Karlsruhe Institute of Technology, Germany* Tailored high Tc superconductor materials for power and magnet applications
11.00 – 11.20	**Dr. Hongyan Chen** – *Karlsruher Institut für Technologie, Germany* Indirect spin-readout of rare-earth-based single-molecule magnet with scanning tunneling microscopy	
11.20 – 11.40	**Prof. Manuel Gruber** – *University of Duisburg-Essen, Germany* Inducing and controlling molecular magnetism through supramolecular manipulation	**Invited talk:** **Prof. Ming Yi** – *Rice University, United States of America* Emergent phases in geometrically-frustrated lattices
11.40 – 12.00	**Dr. Natallia Poddubnaya** – *ITA NASB, Belarus* Magnetoelectric effect of Ni – PZT – Ni layered structures obtained by nickel electrochemical deposition in an external magnetic field	
12.00 – 14.00	Lunch Coffee break	
14.00 - 14.40	**Special talk:** **Dr. Pascal Malkemper** – *Max Planck Institute for Neurobiology of Behavior - caesar, Germany* Navigating in the dark - studying the magnetic sense of mole-rats Chair: Prof. Michael Farle MD162	
14.45 – 18.00	Excursion to Villa Hügel	
18.00 – 21.00	Conference dinner **Special speaker:** Prof. Laura H. Greene	

September 1 / Thursday

<table>
<tr><td>8.30 – 9.30</td><td colspan="2">Plenary talk:
Prof. Harold Hwang – Stanford University, United States of America
Superconductivity in infinite-layer nickelates

Chair: Prof. Rossitza Pentcheva MD162</td></tr>
<tr><td>9.30 – 10.00</td><td colspan="2">Coffee break</td></tr>
<tr><td>10.00 – 12.00</td><td><u>Conference section: Magnetism</u>
Chair: Prof. Mehmet Acet
MD162</td><td><u>Conference section: Superconductivity</u>
Chair: Prof. Rossitza Pentcheva
MC122</td></tr>
<tr><td>10.00 – 10.20</td><td>Dr. Natalia Shkodich – University of Duisburg-Essen, Germany
Magnetic features in nanocrystalline CoMnFeNiGa high entropy alloys: from bulk materials to nanoparticles</td><td rowspan="2">Invited talk:
Dr. Frank Lechermann – Ruhr University Bochum, Germany
Multiorbital perspective on correlated electrons in superconducting nickelates</td></tr>
<tr><td>10.20 – 10.40</td><td>Dr. Asli Cakir – Mugla University, Turkey
FCC-BCC phase transition and magnetism in $MnFeCoNiCu_{20-x}A_x$ (A: Al, Ga) high-entropy alloys</td></tr>
<tr><td>10.40 – 11.00</td><td>Nicolas Josten – University of Duisburg-Essen, Germany
Emergence of magnetic moments in the high anisotropy antiferromagnets NiMn and PdMn</td><td rowspan="2">Invited talk:
Dr. Benjamin Geisler – University of Duisburg-Essen, Germany
Role of the film geometry in the electronic reconstruction of infinite-layer nickelates on $SrTiO_3(001)$</td></tr>
<tr><td>11.00 – 11.20</td><td>Sakia Sophia Noorzayee – University of Duisburg-Essen, Germany
Magnetic-field-biased diffusion during temper-annealing in nearly equiatomic Ni-Mn alloys</td></tr>
</table>

11.20 – 11.40	**Mikel Quintana** – *CIC nanoGUNE, Spain* Precise temperature control of exchange bias fields in graded ferromagnetic multilayers	**Invited talk:** **Prof. Mohammad Akhavan** – *Sharif University of Technology, Iran* Oxygen and rare earth doping effects on $RE_3Ba_5Cu_8O_{19-\delta}$ (RE=Y, Sm) superconductors
11.40 – 12.00	**Nikita Polin** – *Max Planck Institute for Iron Research, Germany* Atomic-scale insights to design of high-performing SmCo based sintered permanent magnets gained by atom probe tomography	
12.00 – 14.00	Lunch Coffee break	
14.00 – 15.20	Conference section: Magnetism Chair: Prof. Ulf Wiedwald MD162	
14.00 – 14.40	**Invited talk:** **Prof. Cornelia Monzel** – *Heinrich-Heine University, Germany* Semisynthetic Magnetic Nanoparticles for Remote Actuation of Biological Processes	
14.40 – 15.20	**Invited talk:** **Dr. Mariia Efremova** – *Eindhoven University of Technology (TU/e), Netherlands* Iron-biomineralizing encapsulin proteins as a new tool for non-invasive tracking and manipulation of mammalian cells	
15.20 – 15.40	**Dr. Konstantinos Simeonidis** – *Aristotle University of Thessaloniki, Greece* Microwave-assisted large-scale synthesis approach for Fe_3O_4 nanoparticles	
15.40 – 16.00	**Dr. Antonios Makridis** – *Aristotle University of Thessaloniki, Greece* Versatile magnetic filament fabrication: A novel pathway for 3D printed biomagnetic scaffolds	
16.00 – 16.30	Coffee break	

16.30 – 18.10	Conference section: Magnetism Chair: Prof. Ulf Wiedwald MD162
16.30 – 17.10	**Invited talk:** **Prof. Makis Angelakeris** – *Aristotle University, Greece* Magnetically driven therapies: Toxicity, Risks and Side-effects
17.10 – 17.30	**Kyriaki Kalaitzidou** – *Aristotle University of Thessaloniki, Greece* Development of Fe_3O_4-decorated Sn-hydroxide nanocomposites for advanced Cr(VI) capture in drinking water
17.30 – 17.50	**Dr. Eirini Myrovali** – *Aristotle University of Thessaloniki, Greece* Hybrid stents based on magnetic hydrogels for biomedical applications
17.50 – 18.10	**Dr. Narek Sisakyan** – *Institute for Physical Research NAS RA, Armenia* Magnetic heating properties of Fe-Fe_3C nanoparticles prepared by method of ferrocene pyrolysis

September 2 / Friday

8.30 – 9.30	**Plenary talk:** **Dr. Andrey Rogalev** – *ESRF, France* Hard X-ray Magnetic Circular Dichroism: Where from? where to? Chair: Dr. Marina Spasova MD162
9.30 – 10.00	Coffee break
10.00 – 12.00	Conference section: Magnetism Chair: Prof. Michael Farle MD162
10.20 – 10.40	**Invited talk:** **Dr. Can Onur Avci** – *Institute of Materials Science of Barcelona (ICMAB-CSIC), Spain* Chiral interlayer coupling in magnetic multilayers
10.40 – 11.00	**Dr. Umut Parlak** – *Technical University of Dortmund, Germany* Laser pump induced hysteresis loop inversion on EuO/Co bilayers

11.00 – 11.20	**Dr. Raghvendra Singh Yadav** – *Tomas Bata University in Zlin, Czech Republic* Magnetic spinel ferrite nanocomposites engineered with MXene/reduced graphene oxide for electromagnetic interference shielding application
11.20 – 11.40	**Prof. Andrea Ehrmann** – *Bielefeld University of Applied Sciences, Germany* Magneto-optical Kerr effect (MOKE) measurements on magnetic nanofiber mats
11.40 – 12.00	**Raphael Kriegl** – *East Bavarian Technical University Regensburg, Germany* Switchable Wettability of micro-structured magnetoactive Elastomers
12.00 – 12.30	Closing ceremony
12.30 – 14.00	Lunch

Poster session

P-1	**Dr. Aleksandr Kazakov** – *Institute of Physics, Polish Academy of Sciences, Poland* Anomalous Hall effect and magnetoresistance in ferromagnetic topological crystalline insulator (111) $Sn_{1-x}Mn_xTe$ epilayers
P-2	**Steffen Bötzel** – *Ruhr University Bochum, Germany* Feedback of non-local d-xy nematicity on the magnetic anisotropy in FeSe
P-3	**Prof. Mohammad Reza Mohammadizadeh** – *Tehran University, Iran* Weak-Links on the MOD-prepared $YBa_2Cu_3O_7$ Thin Films
P-4	**Prof. Emad K. Al-Shakarchi** – *Al-Nahrain University, Iraq* The expected simulation on the structural phase of high-Tc superconductor Compound $YBa_2Cu_{3-y}Pb_yO_{6.5}$
P-5	**Tatiana Smoliarova** – *University Duisburg Essen, Germany* Au-Fe_3O_4 nanohybrids: synthesis and characterization
P-6	**Theopoula Asimakidou** – *Department of Chemical Engineering, Aristotle University of Thessaloniki, Greece* Tuning synthesis of Fe_3O_4 nanoparticles for maximum Cr(VI) uptake from polluted water
P-7	**Milan Tsompanoglou** – *Aristotle University of Thessaloniki, Greece* Correlation of magnetism with magnetic particle hyperthermia efficiency in iron/cementite nanohybrids
P-8	**Inci Nur Sahin** – *University Duisburg Essen, Germany* Heating properties of Fe_3O_4 magnetite nanoparticles dispersed in agarose
P-9	**Dr. Nikolaos Maniotis** – *Aristotle University of Thessaloniki, Greece* The role of the magnetocrystalline anisotropy on the frequency-dependent hyperthermia performance of magnetite nanoparticles
P-10	**Gayane Chilingaryan** – *Institute for Physical Research NAS RA, Armenia* Synthesis and magnetic heating properties of Fe-Fe_3C nanoparticles in a carbon matrix
P-11	**Aikaterini-Rafailia Tsiapla** – *Aristotle University of Thessaloniki, Greece* Magneto-mechanical stress on MDA-MB-231 cancer cells

P-12	**Dr. Thomas Feggeler** – *Lawrence Berkeley National Laboratory, United States* Deciphering magnetization dynamics on the micro- and nanoscale by time-resolved Scanning Transmission X-ray Microscopy
P-13	**Inna Yusnila Khairani** – *University of Wuppertal, Germany* Solvent influence on the magnetization and phase of Fe-Ni alloy nanoparticles generated by Pulsed Laser Ablation in Liquids
P-14	**Shabbir Tahir** – *Bergische University Wuppertal, Germany* Direct laser writing of $Fe_{50}Rh_{50}$ magnetocaloric structures
P-15	**Dr. Natallia Poddubnaya** – *Institute of Technical Acoustics of the National Academy of Sciences of Belarus, Belarus* Magnetoelectric properties of $0,7(0,5BaZr_{0,2}Ti_{0,8}O_3\text{-}0,5Ba_{0,7}Ca_{0,3}TiO_3) – 0,3NiFe_{1,9}Co_{0,02}O_4$ ceramics
P-16	**Konstantina Kazeli** – *Aristotle University of Thessaloniki, Greece* Synthesis and characterization of novel multifunctional magnetic bioceramic nanocomposites
P-17	**Kyrillos Papadopoulos** – *Aristotle University of Thessaloniki, Greece* Synthesis, structural and magnetic properties of multiferroic $BiFeO_3$ nanoparticles
P-18	**Dr. Arun Kumar** – *Indian Institute of Science Education and Research Pune, India* Magnetic ground state of potential giant dielectric constant material $Ba(Fe_{1/2}Sn_{1/2})O_{3-\delta}$
P-19	**Dr. Andrii Savchenko** – *Peter Grünberg Institute and Institute for Advanced Simulation, Forschungszentrum Jülich, Germany* Electric field control of Snell's law for spin waves
P-20	**Dr. Alexey Lukoyanov** – *M.N. Mikheev Institute of Metal Physics of Ural Branch of Russian Academy of Sciences (IMP UB RAS), Russian Federation* Curie temperature in the $GdFe_{1-x}M_xSi$ and $GdRu_{1-x}M_xSi$ systems
P-21	**Moritz Vanselow** – *University Duisburg Essen, Germany* Ferromagnetic resonance of a $Ni_{37}Co_{13}Mn_{33}Ti_{17}$-Heusler single crystal

P-22	**Moritz Sünner** – *University Duisburg Essen, Germany* Magnetocaloric effect in nanocrystalline MnFeNiGeSi high entropy alloys prepared by high energy ball milling and spark plasma sintering
P-23	**Tim Salzmann** – *University Duisburg Essen, Germany* Setup of a UHV chamber for growing ultra-thin epitaxial MAX phase films and in situ characterization
P-24	**Ali Can Aktas** – *University Duisburg Essen, Germany* Metallic Lithium thin films: UHV deposition and CESR studies
P-26	**Dr. Ivan Tarasov** – *University Duisburg Essen, Germany* Correlation of growth modes and magnetic properties of $(Cr_{1-x}Mn_x)_2GaC$ MAX phase epitaxial films on rigid and flexible substrates
P-27	**Dr. Ivan Tarasov** – *University Duisburg Essen, Germany* Band structure and local energy gaps in $(Cr_{1-x}Mnx)_2GaC$ MAX phases studied by ellipsometry in epitaxial films
P-28	**Dr. Arvind Kumar** – *Atma Ram Sanatan Dharma College University of Delhi, India* Magneto-electronic and optical properties of full Heusler alloy, Y_2FeSi: Theoretical investigation using density functional theory with and without spin orbit coupling effect

Social Program – Excursion to the Villa Hügel

The Krupp name, the tradition of this company, its owners, and the family are inseparably linked with the Villa Hügel. Even more: the place stands for the lifestyle of the upper middle classes and thus for an epoch of German history. For the Alfried Krupp von Bohlen und Halbach Foundation, it is a particular task to preserve Villa Hügel and its surrounding park for the present and the future.

Villa Hügel is divided into two building wings. The main building - called the "Big House" - served as the residence of the Krupp family and is connected by a connecting wing to the "Little House", which today houses the Krupp Historical Exhibition. The 269-room flat: According to the evaluation of the old plans, the Villa Hügel with both buildings, connecting wing, cellar, and attic comprises 269 rooms with a total of 8,100 square meters, 103 of which are main living rooms with 4,500 square meters.

The living concept for the main building came from Alfred Krupp. According to his wishes, the ground floor of Villa Hügel contains the official social rooms one can visit: the former reception salons, dining room, and library.

At the time of construction, the "Lower Hall" was furnished with slender iron columns. The building was primarily intended to meet functional criteria. It was only in the course of a comprehensive reconstruction between 1913 and 1916 that the interiors of Villa Hügel were given their present appearance, furnished with historical furniture, family portraits, and valuable tapestries.

269 rooms and 8,100 square meters of living space surrounded by a 28-hectare park: Villa Hügel is far more than an imposing entrepreneurial residence - it symbolizes the age of Germany's industrialization.

At 14, Alfred Krupp (1812-1887) assumed his first responsibilities in the Fried. Krupp. With great success: in the following decades, he expanded the company into one of the most important industrial enterprises of the 19th century. According to his ideas, the Villa Hügel was built between 1870 and 1873 as a home and refuge for the family and a dignified setting for representation, receptions, and festivities. A place for family life - but also for emperors and kings, entrepreneurs from all over the world, politicians, and heads of government of many nations, scientists, and artists.

Laid out almost 150 years ago, the park of Villa Hügel has undergone numerous transformations and redesigns. Depending on functions, design fashions, and preferences, the park served as a retreat for the Krupp family of entrepreneurs and great social representation. It was a place for sports and recreation; its forests and fields provided games for the kitchen, fruit, and vegetables.

For about half a century, the Hügelpark has primarily presented itself in an English landscape park style. However, for knowledgeable eyes, traces of the past can be discovered at every turn. Our park tours are expeditions through a walking and incredible treasure trove full of surprising discoveries. Of course, one can also experience and explore the park without a guided tour. Every year, more than 100,000 visitors come to Hill Park for walks through the nature of an exceptional place.

The Krupp family also furnished the park grounds artistically until 1914. The animal sculptor Albert Hinrich Hußmann created, probably around 1914, the life-size grazing horse made of bronze, which still stands today at the former main access road near Gate II, as if it could raise its head and neigh at any moment – at least when viewed from Villa Hügel. Other sculptures and monuments occupied the hill park, but many were lost over the decades. The works of art still visible today embed themselves harmoniously in the designed nature. On a guided tour through the park, one can learn about the individual objects and their history. A few years ago, the Alfried Krupp von Bohlen und Halbach Foundation, as the owner, decided to revitalize the park's original, still existing structures by intensifying maintenance. The aim is to make what is already there - even if it is fragmentary - visible again and to preserve it.

Today, there are more than 7,000 trees in the hill park, with over 120 species listed in the inventory of woody plants. The most impressive are the majestic old trees and rare shrubs. Native specimens stand side by side with exotic rarities. As a representative of many other venerable plants, we only mention the Blue Atlas Cedar, which originates from Morocco, the Persian ironwood tree, the hanging beech first mentioned in France in 1811, the sickle fir from Japan, and the North American sequoia. Many of these green patriarchs were planted under Alfred Krupp; some are probably around 180 years old. Another highlight is the wild and romantic Rhododendron Gorge. Particularly overwhelming at flowering time in April, and May, when the various rhododendron species and the East Asian tulip magnolias lend the park a unique character.

12th International Conference on Magnetic and Superconducting Materials

University of Duisburg-Essen, Faculty of Physics
August 28 – September 2, 2022