

## Metal and Material Physics Division Fachverband Metall- und Materialphysik (MM)

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On this conference the Metals and Materials Division sets a topical focus on interface-dominated phenomena: segregation, nucleation and phase transformations.

The overall properties of modern nano-structured metals and alloys are to a large extent determined by the mechanical and kinetic behavior of the interfaces in their microstructure. Therefore, a precise characterization and understanding of the processes at interfaces is a key to effective alloy development. In this symposium, we want to review the state of the art in theoretical and experimental analysis, as well as in modeling of interface structure and evolution as a response to annealing, segregation, irradiation, and mechanical deformation, as well as the coupling between these processes. In particular, we focus on contributions on atomistic, micro- and multiscale simulations of interface dominated microstructures, on the experimental characterization and mechanical testing of such structures, as well as on the development of thermodynamic and micromechanical models of interfacial effects.

### Overview of Invited Talks and Sessions

(Lecture halls H2 and H8; Poster P)

#### Invited Talks

MM 1.1	Mon	10:00–10:30	H8	<b>Using mobile interfaces to rapidly move atoms and create sharp chemical boundaries in Fe-C-Mn alloys</b> — ●SYBRAND VAN DER ZWAAG
MM 4.1	Mon	15:15–15:45	H2	<b>Investigation of the early stage of reactive interdiffusion in the Cu-Al system by in-situ transmission electron microscopy</b> — FLORENT MOISY, ●XAVIER SAUVAGE, ERIC HUG
MM 6.1	Wed	10:00–10:30	H8	<b>CALPHAD-informed density-based grain boundary thermodynamics</b> — ●REZA DARVISHI KAMACHALI, LEI WANG, LINLIN LI, ANNA MANZONI, BIRGIT SKROTZKI, GREGORY THOMPSON
MM 7.1	Wed	11:15–11:45	H8	<b>Computational methods for grain boundary segregation in metallic alloys</b> — ●LORENZ ROMANER, DANIEL SCHEIBER, VSEVOLOD RAZUMOVSKIY, OLEG PEIL, CHRISTOPH DÖSINGER, ALEXANDER REICHMANN

#### Plenary Talk

PV VIII	Tue	16:30–17:15	Audimax 1	<b>The Structural Origins of Wood Cell Wall Toughness</b> — ●CYNTHIA VOLKERT
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#### Invited talks of the joint symposium SKM Dissertation Prize 2021 (SYSD)

See SYSD for the full program of the symposium.

SYSD 1.1	Mon	10:00–10:25	Audimax 2	<b>Avoided quasiparticle decay from strong quantum interactions</b> — ●RUBEN VERRESEN, RODERICH MOESSNER, FRANK POLLMANN
SYSD 1.2	Mon	10:25–10:50	Audimax 2	<b>Co-evaporated Hybrid Metal-Halide Perovskite Thin-Films for Optoelectronic Applications</b> — ●JULIANE BORCHERT

SYSD 1.3	Mon	10:55–11:20	Audimax 2	<b>Attosecond-fast electron dynamics in graphene and graphene-based interfaces</b> — ●CHRISTIAN HEIDE
SYSD 1.4	Mon	11:20–11:45	Audimax 2	<b>The thermodynamics of stochastic systems with time delay</b> — ●SARAH A.M. LOOS
SYSD 1.5	Mon	11:50–12:15	Audimax 2	<b>First Results on Atomically Resolved Spin-Wave Spectroscopy by TEM</b> — ●BENJAMIN ZINGSEM

### Invited talks of the joint symposium Potentials for NVs sensing magnetic phases, textures and excitations (SYNV)

See SYNV for the full program of the symposium.

SYNV 1.1	Mon	13:30–14:00	Audimax 2	<b>Harnessing Nitrogen Vacancy Centers in Diamond for Next-Generation Quantum Science and Technology</b> — ●CHUNHUI DU
SYNV 1.2	Mon	14:00–14:30	Audimax 2	<b>Nanoscale imaging of spin textures with single spins in diamond</b> — ●PATRICK MALETINSKY
SYNV 1.3	Mon	14:30–15:00	Audimax 2	<b>Spin-based microscopy of 2D magnetic systems</b> — ●JÖRG WRACHTRUP
SYNV 1.4	Mon	15:15–15:45	Audimax 2	<b>Exploring antiferromagnetic order at the nanoscale with a single spin microscope</b> — ●VINCENT JACQUES
SYNV 1.5	Mon	15:45–16:15	Audimax 2	<b>Nanoscale magnetic resonance spectroscopy with NV-diamond quantum sensors</b> — ●DOMINIK BUCHER

### Invited talks of the joint symposium Amorphous materials: structure, dynamics, properties (SYAM)

See SYAM for the full program of the symposium.

SYAM 1.1	Tue	13:30–14:00	Audimax 1	<b>Glassy dynamics of vitrimers</b> — ●LIESBETH JANSSEN
SYAM 1.2	Tue	14:00–14:30	Audimax 1	<b>Liquid-Liquid Phase Transition in Thin Vapor-Deposited Glass Films</b> — ●ZAHRA FAKHRAAI
SYAM 1.3	Tue	14:30–15:00	Audimax 1	<b>Connection between structural properties and atomic motion in ultraviscous metallic liquids close to the dynamical arrest</b> — ●BEATRICE RUTA, NICO NEUBER, ISABELLA GALLINO, RALF BUSCH
SYAM 1.4	Tue	15:15–15:45	Audimax 1	<b>Signatures of the spatial extent of plastic events in the yielding transition in amorphous solids</b> — ●CELINE RUSCHER, DANIEL KORCHINSKI, JOERG ROTTLER
SYAM 1.5	Tue	15:45–16:15	Audimax 1	<b>Constitutive law for dense agitated granular flows: from theoretical description to rheology experiment</b> — ●OLFA D'ANGELO, W. TILL KRANZ

### Prize talks of the joint Awards Symposium (SYAW)

See SYAW for the full program of the symposium.

SYAW 1.1	Wed	13:30–14:00	Audimax 1	<b>Organic semiconductors - materials for today and tomorrow</b> — ●ANNA KÖHLER
SYAW 1.2	Wed	14:00–14:30	Audimax 1	<b>PbTe/CdTe nanocomposite as an attractive candidate for room-temperature infrared detectors</b> — ●GRZEGORZ KARCZEWSKI
SYAW 1.3	Wed	14:40–15:10	Audimax 1	<b>Fingerprints of correlation in electronic spectra of materials</b> — ●LUCIA REINING
SYAW 1.4	Wed	15:10–15:40	Audimax 1	<b>Artificial Spin Ice: From Correlations to Computation</b> — ●NAËMI LEO
SYAW 1.5	Wed	15:40–16:10	Audimax 1	<b>From microwave optomechanics to quantum transport – carbon nanotubes as highly versatile hybrid devices</b> — ●ANDREAS K. HÜTTEL
SYAW 1.6	Wed	16:20–16:50	Audimax 1	<b>Quantum spin dynamics of a spin-1/2 antiferromagnetic Heisenberg-Ising chain</b> — ●ZHE WANG
SYAW 1.7	Wed	16:50–17:20	Audimax 1	<b>Imaging the effect of electron transfer at the atomic scale</b> — ●LAERTE PATERA

### Invited talks of the joint symposium Spain as Guest of Honor (SYES)

See SYES for the full program of the symposium.

SYES 1.1	Wed	13:30–13:40	Audimax 2	<b>DFMC-GEFES</b> — ●JULIA HERRERO-ALBILLOS
SYES 1.2	Wed	13:40–14:10	Audimax 2	<b>Towards Phononic Circuits based on Optomechanics</b> — ●CLIVIA M. SOTOMAYOR TORRES
SYES 1.3	Wed	14:10–14:40	Audimax 2	<b>Adding magnetic functionalities to epitaxial graphene</b> — ●RODOLFO MIRANDA
SYES 1.4	Wed	14:45–15:15	Audimax 2	<b>Bringing nanophotonics to the atomic scale</b> — ●JAVIER AIZPURUA
SYES 1.5	Wed	15:15–15:45	Audimax 2	<b>Hydrodynamics of collective cell migration in epithelial tissues</b> — ●JAUME CASADEMUNT
SYES 1.6	Wed	15:45–16:15	Audimax 2	<b>Understanding the physical variables driving mechanosensing</b> — ●PERE ROCA-CUSACHS

### Invited talks of the joint symposium Diversity on the Device Scale (SYHN)

See SYHN for the full program of the symposium.

SYHN 1.1	Thu	10:00–10:30	Audimax 1	<b>Scaling behavior of stiffness and strength of hierarchical network nanomaterials</b> — ●SHAN SHI
SYHN 1.2	Thu	10:30–11:00	Audimax 1	<b>Functional and programmable DNA nanotechnology</b> — ●LAURA NA LIU
SYHN 1.3	Thu	11:15–11:45	Audimax 1	<b>Multivalent nanoparticles for targeted binding</b> — ●STEFANO ANGIOLETTI-UBERTI
SYHN 1.4	Thu	11:45–12:15	Audimax 1	<b>Programming Nanoscale Self-Assembly</b> — ●OLEG GANG
SYHN 1.5	Thu	12:15–12:45	Audimax 1	<b>Achieving Global Tunability via Local Programming of a Structure's Composition</b> — ●JOCHEN MUELLER

### Invited talks of the joint symposium The Rise of Photonic Quantum Technologies – Practical and Fundamental Aspects (SYPQ)

See SYPQ for the full program of the symposium.

SYPQ 1.1	Fri	10:00–10:30	Audimax 2	<b>Quantum dots operating at telecom wavelengths for photonic quantum technology</b> — ●SIMONE LUCA PORTALUPI
SYPQ 1.2	Fri	10:30–11:00	Audimax 2	<b>Photonic graph states for quantum communication and quantum computing</b> — ●STEFANIE BARZ
SYPQ 1.3	Fri	11:00–11:30	Audimax 2	<b>Rare-earth ion doped solids at sub-Kelvins: practical and fundamental aspects</b> — ●PAVEL BUSHEV
SYPQ 1.4	Fri	11:45–12:15	Audimax 2	<b>Quantum Light and Strongly Correlated Electronic States in a Moiré Heterostructure</b> — ●BRIAN GERARDOT
SYPQ 1.5	Fri	12:15–12:45	Audimax 2	<b>Quantum communication in fibers and free-space</b> — ●RUPERT URSIN

### Sessions

MM 1.1–1.3	Mon	10:00–11:00	H8	<b>Topical Session Interface-Dominated Phenomena - Moving Interfaces</b>
MM 2.1–2.6	Mon	11:15–12:45	H8	<b>Topical Session Interface-Dominated Phenomena - Moving Interfaces / Functional Properties</b>
MM 3.1–3.6	Mon	13:30–15:00	H2	<b>Topical Session Interface-Dominated Phenomena - Defect Structures and Mechanical Properties</b>
MM 4.1–4.3	Mon	15:15–16:15	H2	<b>Topical Session Interface-Dominated Phenomena - Diffusion</b>
MM 5.1–5.13	Tue	10:00–12:45	P	<b>Topical Session Interface Dominated Phenomena - Poster</b>
MM 6.1–6.3	Wed	10:00–11:00	H8	<b>Topical Session Interface-Dominated Phenomena - Thermodynamics</b>
MM 7.1–7.5	Wed	11:15–12:45	H8	<b>Topical Session Interface-Dominated Phenomena - Segregation and Embrittlement</b>
MM 8	Wed	18:00–19:00	MVMM	<b>Annual General Meeting</b>

## Annual General Meeting of the Metal and Material Physics Division

Wednesday 18:00–19:00 Online Session (session link will be announced in time)