

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

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Overview of Invited Talks and Sessions

(lecture rooms IFW A, IFW B, and IFW D; Poster P5)

Invited Talks

MM 1.1	Mon	10:15–10:45	IFW A	The physics of nano-carbons explored by atomic resolution transmission electron microscopy — ●JANNIK MEYER, SIMON KURASCH, UTE KAISER, ANDREY CHUVILIN, GERARDO ALGARA-SILLER, HYE-JIN PARK, VIERA SKAKALOVA, SIEGMAR ROTH, CRISTINA GOMEZ-NAVARRO, RAVI SUNDARAM, MARKO BURGHARD, KLAUS KERN, JURGEN SMET, TAKAYUKI IWASAKI, ULRICH STARKE, JANI KOTAKOSKI, ARKADY KRASHENINNIKOV
MM 5.1	Mon	14:00–14:30	IFW A	In situ transmission electron microscopy of growth processes and chemical reactions — TAKESHI KASAMA, JÖRG R. JINSCHKE, THOMAS W. HANSEN, JAKOB B. WAGNER, ZI-AN LI, MICHAEL FARLE, ●RAFAL E. DUNIN-BORKOWSKI
MM 13.1	Tue	10:15–10:45	IFW A	Plasticity in confined volumes: new insights into small-scale plasticity — ●CHRISTIAN MOTZ
MM 20.1	Wed	10:15–10:45	IFW A	Atomic-scale modeling of dislocations in iron — ●MATOUS MROVEC
MM 24.1	Wed	14:00–14:30	IFW A	Statistical thermodynamics of defects and interfaces in metals — ●MICHAEL W. FINNIS
MM 32.1	Thu	10:15–10:45	IFW A	Direct simulation of in-situ real time X-ray solidification experiment — ●CHARLES-ANDRÉ GANDIN, GUILLAUME REINHART, NATHALIE MANGELINCK-NOËL, HENRI NGUYEN-THI, BERNARD BILLIA, JOSÉ BARUCHEL

Sessions

MM 1.1–1.1	Mon	10:15–10:45	IFW A	HV Meyer
MM 2.1–2.6	Mon	11:00–13:00	IFW A	Topical Session TEM I
MM 3.1–3.8	Mon	11:00–13:00	IFW B	Computational Materials Modelling I
MM 4.1–4.8	Mon	11:00–13:00	IFW D	Liquid and Amorphous Metals I
MM 5.1–5.1	Mon	14:00–14:30	IFW A	HV Dunin-Borkowski
MM 6.1–6.3	Mon	14:30–15:30	IFW A	Topical Session TEM II
MM 7.1–7.4	Mon	14:30–15:30	IFW B	Computational Materials Modelling II
MM 8.1–8.4	Mon	14:30–15:30	IFW D	Liquid and Amorphous Metals II
MM 9.1–9.5	Mon	15:45–17:30	IFW A	Topical Session TEM III
MM 10.1–10.7	Mon	15:45–17:30	IFW B	Computational Materials Modelling III
MM 11.1–11.6	Mon	15:45–17:15	IFW D	Liquid and Amorphous Metals III
MM 12.1–12.53	Mon	17:30–19:00	P5	Postersitzung I
MM 13.1–13.1	Tue	10:15–10:45	IFW A	HV Motz
MM 14.1–14.6	Tue	11:00–13:00	IFW A	Topical Session TEM IV
MM 15.1–15.8	Tue	11:00–13:00	IFW B	Computational Materials Modelling IV
MM 16.1–16.8	Tue	11:00–13:00	IFW D	Structural Materials
MM 17.1–17.5	Tue	14:00–15:30	IFW A	Topical Session TEM V
MM 18.1–18.6	Tue	14:00–15:30	IFW B	Mechanical Properties I
MM 19.1–19.6	Tue	14:00–15:30	IFW D	Transport

MM 20.1–20.1	Wed	10:15–10:45	IFW A	HV Mrovec
MM 21.1–21.5	Wed	11:00–13:00	IFW A	Topical Session Electron Theory I
MM 22.1–22.6	Wed	11:00–13:00	IFW B	Topical Session TEM VI
MM 23.1–23.9	Wed	11:00–13:15	IFW D	Phase Transformations I
MM 24.1–24.1	Wed	14:00–14:30	IFW A	HV Finnis
MM 25.1–25.3	Wed	14:30–15:30	IFW A	Topical Session Electron Theory II
MM 26.1–26.3	Wed	14:30–15:30	IFW B	Topical Session TEM VII
MM 27.1–27.5	Wed	14:30–15:45	IFW D	Phase Transformations II
MM 28.1–28.5	Wed	15:45–17:15	IFW A	Topical Session Electron Theory III
MM 29.1–29.5	Wed	15:45–17:00	IFW B	Topical Session TEM VIII
MM 30.1–30.4	Wed	16:15–17:15	IFW D	Complex Materials
MM 31.1–31.54	Wed	17:15–18:45	P5	Postersitzung II
MM 32.1–32.1	Thu	10:15–10:45	IFW A	HV Gandin
MM 33.1–33.5	Thu	11:00–13:00	IFW A	Topical Session Electron Theory IV
MM 34.1–34.8	Thu	11:00–13:00	IFW B	Nanomaterials I
MM 35.1–35.7	Thu	11:00–13:00	IFW D	Topical Session Heterogeneous Nucleation I
MM 36.1–36.6	Thu	14:00–16:00	IFW A	Topical Session Electron Theory V
MM 37.1–37.8	Thu	14:00–16:00	IFW B	Nanomaterials II
MM 38.1–38.6	Thu	14:00–16:00	IFW D	Topical Session Diffusionless Transformations I
MM 39.1–39.11	Thu	16:15–19:00	IFW A	Computational Materials Modelling V
MM 40.1–40.5	Thu	16:15–17:30	IFW B	Nanomaterials III
MM 41.1–41.6	Thu	16:15–17:45	IFW D	Topical Session Diffusionless Transformations II
MM 42.1–42.5	Thu	17:45–19:00	IFW B	Functional Materials I
MM 43.1–43.4	Thu	18:00–19:00	IFW D	Mechanical Properties II
MM 44.1–44.11	Fri	10:30–13:15	IFW A	Functional Materials II
MM 45.1–45.5	Fri	10:30–11:45	IFW B	Topical Session Heterogeneous Nucleation II
MM 46.1–46.11	Fri	10:30–13:15	IFW D	Mechanical Properties III

Topical Sessions “New Developments in Transmission Electron Microscopy of Materials”

Organizers: Erdmann Spiecker (Universität Erlangen-Nürnberg), Knut W. Urban (Research Centre Juelich GmbH)

Over the past decade remarkable progress has been achieved in various fields of transmission electron microscopy (TEM). Advances in instrumentation, like aberration correction, new electron sources, improved energy filters and fast detector systems, have not only pushed the limits of spatial and energy resolution to values hardly conceivable before. Novel types of experiments have become feasible, e.g. in the fields of 3D analysis and in-situ microscopy, supported by new tools and techniques for TEM sample preparation and manipulation. The way TEM can contribute not only to a structural characterization of materials and nanostructures but also to a deeper understanding of their properties and processes is more and more recognized and appreciated. The goal of the symposium is to bring together and stimulate discussion among researchers from various disciplines (materials science, physics, chemistry, mineralogy) who develop or apply advanced TEM techniques in their research.

Topical Sessions “Electron Theory in metal physics- magnetic materials, thermodynamics and kinetics of structural defects”

Organizers: Ralf Drautz (Ruhr-Universität Bochum), Christian Elsässer (Fraunhofer-Institut für Werkstoffmechanik IWM, Freiburg), Bernd Meyer (Friedrich-Alexander-Universität Erlangen-Nürnberg)

Density functional theory (DFT) has been established as a reliable and transferable method for the quantitative atomic-level simulation of properties of materials. Simplified models that are derived or parameterized from DFT allow to establish frameworks for modelling properties of materials on coarser levels. With this symposium we encourage metal physicists, theoreticians and experimentalists, to highlight the importance of simplified descriptions of the electronic structure for the development of physical models of metallic materials. The symposium will be dedicated to Manfred Fähnle on the occasion of his 60th birthday. It will focus on four main topics, represented by invited lectures of prominent researchers, as follows:

- Electron theory for metals - applications and recent developments
- Magnetism and spin dynamics in metals
- Intermetallic phases and cluster expansions
- Thermodynamics and kinetics of structural defects

Topical Sessions “Heterogeneous Nucleation and Microstructure Formation: Steps towards a system- and scale-bridging understanding”

Organizers: Heike Emmerich (Universität Bayreuth), Gerhard Wilde (Universität Münster)

A detailed understanding of heterogeneous nucleation is still regarded as one of the open issues of solidification despite the number of classical theories available to describe it at different levels. Lately, a combination of new advanced experimental approaches jointly with molecular and thermodynamic modelling, as well as phase-field simulations, has been proven to provide an efficiently synergetic interplay which helps to access new aspects of heterogeneous nucleation and initial microstructure formation and which enhances the understanding of the basic underlying mechanisms. This session is devoted to investigations in this field with either theoretical, experimental or simulation methods.

Topical Sessions “Diffusionless transformations in magnetic and ferroelectric bulk and thin films”

Organizers: Sebastian Fähler (IFW Dresden), Dietrich Hesse (Max-Planck-Institut für Mikrostrukturphysik, Halle)

Diffusionless phase transformations are at the core of functional materials as (magnetic) shape memory alloys, ferroelectrics, caloric and multiferroic materials. These phase transformations can be controlled by external electric or magnetic fields as well as stress and pressure. Hence these complex materials exhibit multiple new physical effects, which are currently examined with dedicated theoretical and experimental methods.

By highlighting the close connections between the different classes of functional materials this symposium brings together different communities. As external constraints significantly affect these transformations, in particular thin films and nanostructures helped to understand the underlying coupling mechanism.

Invited talks of the joint SKM-Symposium “Diffusionless Transformations in Magnetic and Ferroelectric Bulk and Thin Films” (SKM-SYDT)

See SKM-SYDT for the full program of the symposium.

SKM-SYDT 1.1	Thu	10:30–11:00	TRE Ma	Domain boundaries as active elements in multiferroics and martensites: steps towards Domain Boundary Engineering — ●EKHARD K.H. SALJE
SKM-SYDT 1.2	Thu	11:00–11:30	TRE Ma	Intermediate Phases in Perovskite Solid Solutions — ●IAN REANEY, CLIVE RANDALL, DAVID WOODWARD
SKM-SYDT 1.3	Thu	11:30–12:00	TRE Ma	Adaptive martensite and giant strain effects in multiferroics — ●ULRICH K. RÖSSLER
SKM-SYDT 1.4	Thu	12:00–12:30	TRE Ma	Nature of magnetic coupling in Ni-Mn-based martensitic Heusler alloys — ●MEHMET ACET, SEDA AKSOY, EBERHARD F. WASSERMANN, LLUIS MANOSA, ANTONI PLANES
SKM-SYDT 1.5	Thu	12:30–13:00	TRE Ma	Orthorhombic to tetragonal transition of SrRuO₃ layers in Pr_{0.7}Ca_{0.3}MnO₃/SrRuO₃ superlattices — ●MICHAEL ZIESE, FRANCIS BERN, IONELA VREJOIU, ECKHARD PIPPEL, ELIZAVETA NIKULINA

Invited talks of the joint SKM-Symposium “SKM-Symposium Heterogenous Nucleation and Microstructure Formation: Steps towards a System- and Scale-bridging Understanding” (SKM-SYMF)

See SKM-SYMF for the full program of the symposium.

SKM-SYMF 1.1	Thu	14:30–15:00	TRE Ma	Visualizing the structural solid-liquid transition with colloidal suspensions — ●PETER SCHALL
SKM-SYMF 1.2	Thu	15:00–15:30	TRE Ma	Crystallization process in suspensions of hard spheres — ●TANJA SCHILLING, HANS-JOACHIM SCHOEPE, MARTIN OETTEL, GEORGE OPLETAL, IAN SNOOK
SKM-SYMF 1.3	Thu	15:30–16:00	TRE Ma	Homogeneous bulk, surface, and edge nucleation in crystalline nanodroplets — ●KARI DALNOKI-VERESS, JESSICA CARVALHO
SKM-SYMF 1.4	Thu	16:00–16:30	TRE Ma	Polymer Crystallization: Ordered Structures in Complex Systems — ●JENS-UWE SOMMER
SKM-SYMF 1.5	Thu	16:30–17:00	TRE Ma	Phase formation and microstructure development in multi-component alloys — ●JÜRGEN ECKERT

Annual General Meeting of the Metal and Material Physics Division

Mittwoch 19:00 - 20:00 IFW B

- Report of the chairman of the Metal and Material Physics Division
- Invited talks and symposia for the next spring meeting 2012
- Other topics