

Surface Science Division Fachverband Oberflächenphysik (O)

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Overview of Invited Talks and Sessions

(Lecture halls CHE 89, CHE 91, GER 37, GER 38, GER 39, WIL A 213,
REC C 213, TRE Phy, TRE Ma, HSZ 01 and HSZ 02; Poster P2/EG)

Plenary Talk

PLV V Wed 8:30– 9:15 HSZ 01 **Advances in Ultrafast Electron Microscopy** — ●CLAUS ROPERS

Laureate of the Gaede Prize 2023

PRV II Wed 13:15–13:45 HSZ 01 **Towards chemical and optical band structure engineering in molecular-based heterostructures** — ●BENJAMIN STADTMUELLER

Overview Talks

O 1.1 Mon 9:30–10:15 TRE Phy **From surface structure to exciton evolution: a many-body theoretical perspective** — ●SIVAN REFAELY-ABRAMSON

O 27.1 Tue 9:30–10:15 TRE Phy **Dive right in! Molecular insights into electrochemical surface science** — ●KATRIN F. DOMKE

O 44.1 Wed 9:30–10:15 TRE Phy **Spins on Surfaces: A Gateway to the Quantum World** — ●CHRISTIAN R. AST

O 71.1 Thu 9:30–10:15 TRE Phy **Surface dynamics under reaction conditions** — ●EDVIN LUNDGREN

O 90.1 Fri 9:30–10:15 TRE Phy **Molecular Surfaces With a Twist: Magnetochiral Asymmetries and Topological Self-Assembly** — ●KARL-HEINZ ERNST

O 98.1 Fri 13:15–14:00 HSZ 03 **Surfaces go topological – third generation 2D quantum materials** — ●RALPH CLAESSEN

Invited Talks of the joint Symposium Ultrafast Excitation Pathways of Quantum Materials (SYUE)

See SYUE for the full program of the symposium.

SYUE 1.1 Wed 9:30–10:00 HSZ 01 **Dynamics and control in quantum materials using multi-terahertz spectroscopy** — ●RICHARD AVERITT

SYUE 1.2 Wed 10:00–10:30 HSZ 01 **Accessing the nonthermal phonon populations in 2D materials with femtosecond electron diffuse scattering** — ●HÉLÈNE SEILER, MARIOS ZACHARIAS, DANIELA ZAHN, PATRICK-NIGEL HILDEBRANDT, THOMAS VASILEIADIS, YOAV WILLIAM WINDSOR, YINGPENG QI, CHRISTIAN CARBOGNO, CLAUDIA DRAXL, RALPH ERNSTORFER, FABIO CARUSO

SYUE 1.3 Wed 10:30–11:00 HSZ 01 **Exciting potentials – Exploring the realms of ultrafast phase transitions** — ●LAURENZ RETTIG

SYUE 1.4 Wed 11:15–11:45 HSZ 01 **Sub-cycle multidimensional spectroscopy of strongly correlated materials** — VIKTOR VALMISPILD, EVGENY GORELOV, MARTIN ECKSTEIN, ALEXANDER LICHTENSTEIN, HIDEO AOKI, MIKHAIL KATSNELSON, MISHA IVANOV, ●OLGA SMIRNOVA

SYUE 1.5	Wed	11:45–12:15	HSZ 01	Witnessing many-body entanglement in light-driven quantum materials — ●MATTEO MITRANO, DENITSA BAYKUSHEVA, MONA KALTHOFF, DAMIAN HOFMANN, MARTIN CLAASSEN, DANTE KENNES, MICHAEL SENTEF
SYUE 1.6	Wed	12:15–12:45	HSZ 01	Optical responses of photoexcited materials: from parametric amplification to photoinduced superconductivity — ●EUGENE DEMLER

Invited Talks of the joint Symposium Physics of van der Waals 2D Heterostructures (SYHS)

See SYHS for the full program of the symposium.

SYHS 1.1	Fri	9:30–10:00	HSZ 01	Novel moiré excitons and ultrafast optical dynamics in van der Waals 2D heterostructures — ●STEVEN G. LOUIE
SYHS 1.2	Fri	10:00–10:30	HSZ 01	Interaction induced magnetism in 2D semiconductor moiré superlattices — ●XIAODONG XU
SYHS 1.3	Fri	10:30–11:00	HSZ 01	Ions in tight places: intercalation and transport of ions in van der Waals heterostructures — ●IRINA GRIGORIEVA
SYHS 1.4	Fri	11:15–11:45	HSZ 01	Spin-orbit proximity in van der Waals heterostructures — ●FELIX CASANOVA
SYHS 1.5	Fri	11:45–12:15	HSZ 01	Plethora of many-body ground states in magic angle twisted bilayer graphene — ●DMITRI EFETOV

Topical Talks of the Focus Session "Frontiers of Electronic-Structure Theory" (joint Session O/HL)

O 9.3	Mon	11:00–11:30	TRE Ma	Large-scale machine-learning assisted discovery and characterization of materials — ●MIGUEL ALEXANDRE LOPES MARQUES
O 17.1	Mon	15:00–15:30	TRE Ma	Coupled-cluster theory for complex solids made ready — ●ANDREAS GRÜNEIS
O 35.4	Tue	11:15–11:45	TRE Ma	Towards low-scaling GW calculations for 2D materials — ●JAN WILHELM
O 53.2	Wed	10:45–11:15	TRE Ma	TREX: an integrated HPC software platform for quantum Monte Carlo calculations — ●CLAUDIA FILIPPI
O 61.5	Wed	16:15–16:45	TRE Ma	Challenges in modelling correlated electronic matter — ●ROSER VALENTI
O 79.3	Thu	11:00–11:30	TRE Ma	New Opportunities for First Principles Simulations of Thousands of Atoms Using Linear Scaling Density Functional Theory — ●LAURA RATCLIFF

Topical Talks of the Focus Session "Ion Beam Interaction with Surfaces and 2D Materials"

O 5.1	Mon	10:30–11:00	GER 38	Highly charged, slow and swift ions interacting with surfaces and 2D materials — ●MARIKA SCHLEBERGER
O 5.4	Mon	11:30–12:00	GER 38	A contactless single-step process for simultaneous nanoscale patterning and cleaning of large-area graphene — ●TUAN TRAN
O 13.1	Mon	15:00–15:30	GER 38	Space weathering of planetary surfaces — ●PETER WURZ
O 31.1	Tue	10:30–11:00	GER 38	Ultra-low energy ion implantation of two-dimensional materials — ●HANS HOFSSÄSS

Topical Talks of the Focus Session "Scanning Probe Microscopy with Quartz Sensors"

O 45.2	Wed	10:45–11:15	CHE 89	Single-molecule reactions performed and characterized using atomic force microscopy — ●LEO GROSS
O 54.1	Wed	15:00–15:30	CHE 89	Peering into interfacial water by qPlus-based atomic force microscopy — ●YING JIANG
O 54.5	Wed	16:15–16:45	CHE 89	AFM with the qPlus sensor: An ideal tool for oxide surface science — ●ULRIKE DIEBOLD

O 87.1	Thu	15:00–15:30	TRE Ma	Quartz-sensor detection for single-electron tunneling spectroscopy — •JASCHA REPP
O 87.5	Thu	16:15–16:45	TRE Ma	Application of atomic force microscopy with quartz sensors to quantum states in graphene and related twisted heterostructures — •JOSEPH STROSCIO
O 97.4	Fri	11:15–11:45	TRE Ma	Heteroatom-substituted and three-dimensional nanocarbon materials studied with low temperature STM and qPlus AFM — •SHIGEKI KAWAI

Topical Talks of the Focus Session "Semiconductor Surface Chemistry - from Reaction Mechanisms to Well-Ordered Interfaces"

O 48.1	Wed	10:30–11:00	GER 38	Surface functionalization of semiconductors: Introducing spectroscopic labels, monolayer control for ultra-shallow doping, and providing surface passivation for atomically-precise processes — •ANDREW TEPLYAKOV
O 48.3	Wed	11:15–11:45	GER 38	Growth of organic monolayers on Si(111) — •MARTIN FRANZ
O 57.1	Wed	15:00–15:30	GER 38	Incorporation of arsenic into silicon (001) and germanium (001) for atomic-scale device fabrication. — •STEVEN R. SCHOFIELD
O 57.3	Wed	15:45–16:15	GER 38	Semiconductor surface chemistry towards hybrid interfaces with ab initio approaches — •RALF TONNER-ZECH

Topical Talks of the Focus Session "Ultrafast Dynamics in Nanostructures"

O 75.1	Thu	10:30–11:00	GER 38	Ultrafast nano-imaging: probing quantum dynamics in space and time — •MARKUS RASCHKE
O 75.5	Thu	11:45–12:15	GER 38	Lightwave-driven scanning tunneling microscopy and spectroscopy at the atomic scale — •VEDRAN JELIC
O 83.1	Thu	15:00–15:30	GER 38	Imaging ultrafast electron dynamics in isolated nanoparticles — •DANIELA RUPP
O 83.5	Thu	16:15–16:45	GER 38	Ultrafast coherent manipulation of free electrons via quantum interaction with shaped optical fields — •GIOVANNI MARIA VANACORE

General Invited Topical Talks

O 7.1	Mon	10:30–11:00	REC C 213	Superconductivity in atom-by-atom crafted quantum corrals — •LUCAS SCHNEIDER
O 10.1	Mon	15:00–15:30	CHE 89	Photoemission Orbital Tomography: Imaging Molecular Wave Functions in Reciprocal and Real Space — •F. S. TAUTZ
O 16.4	Mon	15:45–16:15	TRE Phy	Microscopic insight into non-equilibrium dynamics through time-resolved x-ray absorption spectroscopy — •ANDREA ESCHENLOHR
O 33.1	Tue	10:30–11:00	REC C 213	Fermi liquids, Luttinger integrals, topological invariants ... and magnetic molecules — •ROK ZITKO
O 34.6	Tue	11:45–12:15	TRE Phy	Photoemission orbital tomography for excitons — •PETER PUSCHNIG
O 52.4	Wed	11:15–11:45	TRE Phy	Modeling and Design of Single-Atom Alloy Catalysts — •MIE ANDERSEN
O 59.1	Wed	15:00–15:30	REC C 213	Interplay of Inversion Symmetry Breaking and Spin-Orbit Coupling — •MAXIMILIAN ÜNZELMANN
O 58.3	Wed	15:30–16:00	WIL A317	Phase-locked photon-electron interaction without a laser — •NAHID TALEBI
O 55.6	Wed	16:15–16:45	CHE 91	Towards Understanding and Controlling On-Surface Reactions and Self-Assembly Mechanisms — •DANIEL EBELING
O 80.3	Thu	15:30–16:00	CHE 89	Topological Plasmonics and Plasmonic Twistronics: Skyrmions, Merons, Quasicrystals, and Skyrmion Bags — •HARALD GIESSEN
O 86.3	Thu	15:30–16:00	TRE Phy	Novel concepts to simulate electrified liquid/solid interfaces from first principles — •STEFAN WIPPERMANN

Sessions

O 1.1–1.1	Mon	9:30–10:15	TRE Phy	Overview Talk Sivan Refaely-Abramson
O 2.1–2.10	Mon	10:30–13:00	CHE 89	Organic Molecules on Inorganic Substrates I: Electronic, Optical and Other Properties I
O 3.1–3.7	Mon	10:30–12:15	CHE 91	Metal Substrates: Adsorption and Reaction of Small Molecules I
O 4.1–4.8	Mon	10:30–12:30	GER 37	Tribology: Surfaces and Nanostructures
O 5.1–5.8	Mon	10:30–13:00	GER 38	Focus Session: Ion Beam Interaction with Surfaces and 2D Materials I
O 6.1–6.10	Mon	10:30–13:00	GER 39	New Methods: Experiments and Theory
O 7.1–7.9	Mon	10:30–13:00	REC C 213	Spins on Surfaces at the Atomic Scale I
O 8.1–8.9	Mon	10:30–12:45	TRE Phy	Ultrafast Electron Dynamics at Surface and Interfaces I
O 9.1–9.8	Mon	10:30–13:00	TRE Ma	Focus Session: Frontiers of Electronic-Structure Theory I (joint session O/HL)
O 10.1–10.9	Mon	15:00–17:30	CHE 89	Organic Molecules on Inorganic Substrates II: Electronic, Optical and Other Properties II
O 11.1–11.9	Mon	15:00–17:15	CHE 91	Surface Reactions
O 12.1–12.8	Mon	15:00–17:00	GER 37	Scanning Probe Techniques: Method Development I
O 13.1–13.8	Mon	15:00–17:15	GER 38	Focus Session: Ion Beam Interaction with Surfaces and 2D Materials II
O 14.1–14.11	Mon	15:00–17:45	GER 39	Nanostructures at Surfaces (joint session O/PPP)
O 15.1–15.12	Mon	15:00–18:00	REC C 213	Spins on Surfaces at the Atomic Scale II
O 16.1–16.9	Mon	15:00–17:30	TRE Phy	Ultrafast Electron Dynamics at Surface and Interfaces II
O 17.1–17.7	Mon	15:00–17:15	TRE Ma	Focus Session: Frontiers of Electronic-Structure Theory II (joint session O/HL)
O 18.1–18.9	Mon	18:00–20:00	P2/EG	Poster: 2D Materials I
O 19.1–19.9	Mon	18:00–20:00	P2/EG	Poster: Ultrafast Electron Dynamics at Surface and Interfaces I
O 20.1–20.11	Mon	18:00–20:00	P2/EG	Poster: Spins and Magnetism at Surfaces
O 21.1–21.7	Mon	18:00–20:00	P2/EG	Poster: Scanning Probe Techniques
O 22.1–22.9	Mon	18:00–20:00	P2/EG	Poster Session: Organic Molecules on Inorganic Substrates I
O 23.1–23.6	Mon	18:00–20:00	P2/EG	Poster: Surface Reactions
O 24.1–24.5	Mon	18:00–20:00	P2/EG	Poster: Ion Beam Interaction with Surfaces and Interfaces
O 25.1–25.5	Mon	18:00–20:00	P2/EG	Poster: Metal Substrates
O 26.1–26.8	Mon	18:00–20:00	P2/EG	Poster: New Methods
O 27.1–27.1	Tue	9:30–10:15	TRE Phy	Overview Talk Katrin Domke
O 28.1–28.10	Tue	10:30–13:00	CHE 89	Organic Molecules on Inorganic Substrates III: Adsorption and Growth I
O 29.1–29.10	Tue	10:30–13:00	CHE 91	Supported Nanoclusters: Structure, Reactions and Catalysis
O 30.1–30.11	Tue	10:30–13:15	GER 37	2D Materials I: Electronic Structure
O 31.1–31.8	Tue	10:30–12:45	GER 38	Focus Session: Ion Beam Interaction with Surfaces and 2D Materials III
O 32.1–32.9	Tue	10:30–12:45	GER 39	Semiconductor Substrates
O 33.1–33.9	Tue	10:30–13:00	REC C 213	Spins on Surfaces at the Atomic Scale III
O 34.1–34.10	Tue	10:30–13:15	TRE Phy	Ultrafast Electron Dynamics at Surface and Interfaces III
O 35.1–35.7	Tue	10:30–12:45	TRE Ma	Focus Session: Frontiers of Electronic-Structure Theory III (joint session O/HL)
O 36.1–36.12	Tue	18:00–20:00	P2/EG	Poster: 2D Materials II
O 37.1–37.13	Tue	18:00–20:00	P2/EG	Poster: Ultrafast Electron Dynamics at Surface and Interfaces II
O 38.1–38.7	Tue	18:00–20:00	P2/EG	Poster: Organic Molecules on Inorganic Substrates II
O 39.1–39.6	Tue	18:00–20:00	P2/EG	Poster Session: Heterogeneous Catalysis and Surface Dynamics
O 40.1–40.4	Tue	18:00–20:00	P2/EG	Poster: Semiconductor Substrates
O 41.1–41.4	Tue	18:00–20:00	P2/EG	Poster: Supported Nanoclusters
O 42.1–42.12	Tue	18:00–20:00	P2/EG	Poster: Nanostructures at Surfaces
O 43.1–43.8	Tue	18:00–20:00	P2/EG	Poster: Plasmonics and Nanooptics I
O 44.1–44.1	Wed	9:30–10:15	TRE Phy	Overview Talk Christian Ast
O 45.1–45.7	Wed	10:30–12:30	CHE 89	Focus Session: Scanning Probe Microscopy with Quartz Sensors I
O 46.1–46.7	Wed	10:30–12:15	CHE 91	Electron-Driven Processes at Surfaces and Interfaces

O 47.1–47.10	Wed	10:30–13:00	GER 37	2D Materials II: Growth, Structure and Substrate Interaction I
O 48.1–48.5	Wed	10:30–12:15	GER 38	Focus Session: Semiconductor Surface Chemistry – from Reaction Mechanisms to Well-Ordered Interfaces I
O 49.1–49.9	Wed	10:30–12:45	WIL A317	Plasmonics and Nanooptics I: Fabrication and Application
O 50.1–50.4	Wed	10:30–11:30	REC C 213	Spins on Surfaces at the Atomic Scale IV
O 51.1–51.6	Wed	11:30–13:00	REC C 213	Surface Magnetism
O 52.1–52.8	Wed	10:30–12:45	TRE Phy	Heterogeneous Catalysis and Surface Dynamics I
O 53.1–53.8	Wed	10:30–13:00	TRE Ma	Focus Session: Frontiers of Electronic-Structure Theory IV (joint session O/HL)
O 54.1–54.8	Wed	15:00–17:30	CHE 89	Focus Session: Scanning Probe Microscopy with Quartz Sensors II
O 55.1–55.10	Wed	15:00–17:45	CHE 91	Organic Molecules on Inorganic Substrates IV: Adsorption and Growth II
O 56.1–56.10	Wed	15:00–17:30	GER 37	2D Materials III: Growth, Structure and Substrate Interaction II (joint session O/PPP)
O 57.1–57.6	Wed	15:00–17:00	GER 38	Focus Session: Semiconductor Surface Chemistry – from Reaction Mechanisms to Well-Ordered Interfaces II
O 58.1–58.9	Wed	15:00–17:30	WIL A317	Plasmonics and Nanooptics II: Light-Matter Interaction and Spectroscopy I
O 59.1–59.10	Wed	15:00–17:45	REC C 213	Electronic Structure of Surfaces I
O 60.1–60.12	Wed	15:00–18:00	TRE Phy	Solid-Liquid Interfaces I: Structure and Spectroscopy
O 61.1–61.8	Wed	15:00–17:30	TRE Ma	Focus Session: Frontiers of Electronic-Structure Theory V (joint session O/HL)
O 62.1–62.8	Wed	15:00–18:30	POT 81	Focus Session: Wissenschaftskommunikation / Outreach (joint session HL/O/TT)
O 63.1–63.2	Wed	18:00–20:00	P2/EG	Poster: Data Management
O 64.1–64.12	Wed	18:00–20:00	P2/EG	Poster: Graphene
O 65.1–65.6	Wed	18:00–20:00	P2/EG	Poster: Topology and Symmetry-Protected Materials
O 66.1–66.11	Wed	18:00–20:00	P2/EG	Poster: Scanning Probe Microscopy with Quartz Sensors
O 67.1–67.10	Wed	18:00–20:00	P2/EG	Poster: Electronic Structure of Surfaces
O 68.1–68.5	Wed	18:00–20:00	P2/EG	Poster: Oxide and Insulator Surfaces
O 69.1–69.14	Wed	18:00–20:00	P2/EG	Poster: Solid-Liquid Interfaces
O 70.1–70.10	Wed	18:00–20:00	P2/EG	Poster: Plasmonics and Nanooptics II
O 71.1–71.1	Thu	9:30–10:15	TRE Phy	Overview Talk Edvin Lundgren
O 72.1–72.5	Thu	10:30–13:00	CHE 89	Gerhard Ertl Young Investigator Award Competition
O 73.1–73.8	Thu	10:30–12:30	CHE 91	Metal Substrates: Adsorption and Reaction of Small Molecules II
O 74.1–74.9	Thu	10:30–12:45	GER 37	2D Materials IV: Heterostructures (joint session O/PPP)
O 75.1–75.9	Thu	10:30–13:15	GER 38	Focus Session: Ultrafast Dynamics in Nanostructures I
O 76.1–76.9	Thu	10:30–12:45	WIL A317	Plasmonics and Nanooptics III: Light-Matter Interaction and Spectroscopy II
O 77.1–77.9	Thu	10:30–12:45	REC C 213	Scanning Probe Techniques: Method Development II
O 78.1–78.9	Thu	10:30–12:45	TRE Phy	Heterogeneous Catalysis and Surface Dynamics II
O 79.1–79.7	Thu	10:30–12:45	TRE Ma	Focus Session: Frontiers of Electronic-Structure Theory VI (joint session O/HL)
O 80.1–80.8	Thu	15:00–17:15	CHE 89	Plasmonics and Nanooptics IV: Light-Matter Interaction and Spectroscopy III
O 81.1–81.12	Thu	15:00–18:00	CHE 91	Oxide and Insulator Surfaces I: Adsorption and Reaction of Small Molecules
O 82.1–82.9	Thu	15:00–17:15	GER 37	Graphene I: Adsorption, Intercalation and Doping
O 83.1–83.8	Thu	15:00–17:30	GER 38	Focus Session: Ultrafast Dynamics in Nanostructures II
O 84.1–84.11	Thu	15:00–18:30	WIL A317	Focus Session: Making Experimental Data F.A.I.R. – New Concepts for Research Data Management I (joint session O/TT)
O 85.1–85.11	Thu	15:00–17:45	REC C 213	Electronic Structure of Surfaces II
O 86.1–86.10	Thu	15:00–17:45	TRE Phy	Solid-Liquid Interfaces II: Reactions and Electrochemistry I
O 87.1–87.8	Thu	15:00–17:30	TRE Ma	Focus Session: Scanning Probe Microscopy with Quartz Sensors III
O 88	Thu	19:00–19:30	HSZ 01	Members' Assembly
O 89	Thu	19:30–20:30	HSZ 01	Post-Deadline Session

O 90.1–90.1	Fri	9:30–10:15	TRE Phy	Overview Talk Karl-Heinz Ernst
O 91.1–91.9	Fri	10:30–12:45	CHE 89	Plasmonics and Nanooptics V: Waveguides and Antennas
O 92.1–92.10	Fri	10:30–13:00	CHE 91	Oxide and Insulator Surfaces II: Structure, Epitaxy and Growth
O 93.1–93.8	Fri	10:30–12:30	GER 37	Graphene II: Electronic Structure and Growth
O 94.1–94.10	Fri	10:30–13:00	GER 38	Topology and Symmetry-Protected Materials
O 95.1–95.11	Fri	9:30–12:45	WIL A317	Focus Session: Making Experimental Data F.A.I.R. – New Concepts for Research Data Management II (joint session O/TT)
O 96.1–96.10	Fri	10:30–13:00	TRE Phy	Solid-Liquid Interfaces III: Reactions and Electrochemistry II
O 97.1–97.8	Fri	10:30–12:45	TRE Ma	Focus Session: Scanning Probe Microscopy with Quartz Sensors IV
O 98.1–98.1	Fri	13:15–14:00	HSZ 03	Overview Talk Ralph Claessen

Members' Assembly of the Surface Science Division

Thursday 19:00–19:30 HSZ 01

- Report of the Chairman
- Presentation of the Gerhard Ertl Young Investigator Award
- Miscellaneous