

5th SALVE Symposium

09/2023



Low-voltage research proceedings with contributions from:

P. Ajayan, C. Backes, E. Besley, F.-R. Chen, M. Drndic, R. Dunin-Borkowski, M. Elbaum, X. Feng, S. Gorji, P. Huang, C. Humphreys, J.-C. Idrobo, U. Kaiser, A. N. Khlobystov, R. Klie, C. Koch, A. Konecna, J. Kotakoski, A. Krasheninnikov, T. Latychevskaia, S. Lazar, L.-J. Li, J. Lin, M. Linck, J. Mayer, J.C. Meyer, K. Molhave, K. Müller-Caspary, J. Park, T. Pichler, Q. Ramasse, G. Schneider, R. Sinclair, V. Skakalova, E. Spiecker, M. Stöger-Pollach, K. Suenaga, M. Sui, T. Susi, A. Turchanin, S. van Aert, M. Willinger, L. Yadgarov, J. Zhao, X. Zhong, W. Zhou, Y. Zhu



All talks are in M28 (TTU) lecture room, Meyerhofstrasse, 89081 Ulm

Monday, September 25th, Morning Sessions

- 8:00 – 8:45 *Registration (N27, Foyer)*
Opening (TTU)
- 8:45 – 8:52 *ERHU music performance by Dr. Yueliang Li*
- 8:55 – 9:10 *Michael Weber, president of Ulm University, DE*
Ute Kaiser, Ulm University, DE
- 9:15 – 9:30 *Chamber music ensemble “Akkordverdächtig”*
cond. Vivien Hild
- Chair: R. Sinclair* *Session 1*
- 9:30 – 10:00 *Lain-Jong Li (Lance Li), Hong Kong University, HK*
Potential Applications of 2D Materials in Electronics
- 10:00 – 10:30 *Ute Kaiser, Ulm University, DE*
On the happy marriage between low-voltage TEM and low-dimensional materials
- 10:30 – 11:00 *Coffee break*
- Chair: Y. Zhu* *Session 2*
- 11:00 – 11:30 *Pulickel Ajayan, Rice University, US*
B-N-C Phases and 2D/3D Structures
- 11:30 - 12:00 *Kazu Suenaga, Osaka University, JP*
Electron microscopy and spectroscopy on 2D hybrid materials
- 12:00 – 12:30 *Fu-Rong Chen, City University of Hong Kong, HK*
Atomic Resolution 3D Dynamics of Helix Materials at Low Dose Mode
- 12:30 – 13:00 *Colin Humphreys, Queen Mary University of London, UK*
2D electronics beyond silicon
- 13:00 – 14:00 *Lunch*



Monday, September 25th, Afternoon Sessions

Chair: K. Suenaga

Session 3

14:00 – 14:30

Marija Drndic, *Pennsylvania University, USA*

Sculpting of 2D Materials: From Pores to Nanoporous Membranes

14:30 - 15:00

Pinshane Huang, *University of Illinois Urbana, US*

In-situ STEM and ptychography of 2D interfaces

15:00 – 15:30

Jannik C. Meyer, *Tübingen University, DE*,

Fabrication and analysis of 2D and mixed-dimensional heterostructures from combinations of aligned stacking, e-beam patterning, ion doping and molecular sandwiching

15:30 – 16:00

Sandra Van Aert, *Antwerp University, BE*

Recent advances in quantifying atomic structures and their dynamics from STEM data

16:00 – 16:30

Coffee break

Chair: W. Jäger

Session 4:

16:30 – 17:00

TESCAN

17:00 – 17:30

Andrey Turchanin, *Jena University, DE*

CVD synthesis and properties of monolayer lateral heterostructure and Janus TMDs

17:30 – 18:00

Quentin Ramasse, *SuperSTEM Labs, Daresbury, UK*

Studying the chemistry and electronic structure of nanotube-encapsulated molecular and atomic systems with high-resolution STEM-EELS

19:00 – 20:00

Visit the roofs of Ulm Minster or take a guided City Walk



Tuesday, September 26th, Morning Sessions

Chair T. Pichler

Session 5

9:00 – 9:30

Andrea Konečná, *Brno University of Technology, Brno, CZ*

Optical properties of 2D materials probed by electron energy-loss spectroscopy

9:30 – 10:00

Elena Besley, *Nottingham University, UK*

Molecular Quantum Rings: from Electronic Structure to Packing Behaviour

10:00 – 10:30

Christoph Koch, *Humboldt University Berlin, DE*

Observing atoms in motion by fast electrons

10:30 – 11:00

Coffee break

Chair: X. Feng

Session 5

11:00 – 11:30

Andrei N. Khlobystov, *Nottingham University, UK*

Chemical Reactions Promoted by the Electron Beam in Transmission Electron Microscopy

11:30 – 12:00

Lena Yadgarov, *Ariel University, ISR*

Exploring the Synthesis Mechanisms of Novel CsPbBr₃@MoS₂ Nanostructures toward their implementation in the field of renewable energy

12:00 – 12:30

Claudia Backes, *Kassel University, DE*

Production of organic nanomaterials by liquid phase exfoliation

12:30 – 13:30

Lunch



Tuesday, September 26th, Afternoon Sessions

Chair: E. Besley

Session 6

13:30 – 14:00

Robert Sinclair, *Stanford University, USA*

TEM studies of Twisted Epitaxial Gold
Nanoparticles in Twisted MoS₂ Bilayers

14:00 – 14:30

Marc Willinger, *TU München, DE*

Graphene folding and fabrication of twisted layer
graphene

14:30 – 15:00

Robert Klie, *Illinois University Chicago, US*

Atomic-Resolution cryo-STEM/EELS for the Study
of 1D and 2D Materials

15:00 – 15:30

Arkady Krasheninnikov, *HZDR, Rossendorf, DE*

Engineering the Structure and Properties of 2D
Materials by Defect Creation and Intercalation

15:30 – 16:00

Coffee break

Chair: J. C. Meyer

Session 7

16:00 – 16:30

Martin Linck, *CEOS GmbH, Heidelberg, DE,*

Present limitations and future prospects of
hexapole-type aberration correctors for STEM

16:30 – 17:00

Thomas Pichler, *Wien University, AT*

Recent advances of momentum resolved electron
energy-loss spectroscopy

17:00 – 17:30

Xiaoyan Zhong, *City University of Hong Kong, HK*

Achromatic imaging of electron energy loss
spectroscopy and electron magnetic circular
dichroism with atomic plane resolution

17:30 – 18:00

Michael Stöger-Pollach, *TU Wien, AT*

2D electron gases in oxide interfaces

18:00.–.18:25

Fingerfood.....(Foyer N27)

18:30 – 19:30

Piano Concert: Valerij Petasch, MUZ (H 4/5 O25)

20:00 – 22:00

Dinner Ulm City



Wednesday, September 27th, Morning Sessions

Chair E. Spiecker

[Session 8](#)

9:00 – 9:30

Yimei Zhu, *BNL, Upton, USA*

Emerging Electron Microscopy Techniques for Probing Quantum Materials

9:30 – 10:00

Toma Susi, *Wien University, AT*

Achievements and Challenges for Scaling Up Electron-Beam Manipulation of Graphene Impurities

10:00 – 10:30

Jiong Zhao, *Hong Kong Polytechnic University, HK*

In situ transmission electron microscopy on two-dimensional ferroic chalcogenides

10:30 – 11:00

Coffee break

Chair: M. Willinger

[Session 9](#)

11:00 – 11:30

Grégory Schneider, *Leiden University, NL*

Electron microscopy of graphene nanopores: 2010-2023

11:30 – 12:00

Jungwon Park, *Seoul National University, KOR*

3D and 4D Structures of Colloidal Nanoparticles by Graphene Liquid Cell TEM

12:00 – 12:30

Erdmann Spiecker, *Erlangen University, DE*

Twist enables superlubric sliding in bilayer graphene

12:30 – 13:30

Lunch



Wednesday, September 27th, Afternoon Sessions

Chair: J. Mayer

Session 10

- 13:30 – 14:00 Sorin Lazar, *ThermoFisher, Eindhoven, NL*
EELS at Extreme Energy Losses - an Opportunity to provide complementary Information to XAS
- 14:00 – 14:30 Wu Zhou, *University of Chinese Academy of Sciences, CN*
Single-atom microscopy and spectroscopy for carbon nanomaterials
- 14:30 – 15:00 Junhao Lin, *Southern University of Science and Technology, Shenzhen, CN*
Studying the intrinsic structure-property correlation in air-sensitive low D materials by a home-built glovebox interconnected system (GIS)
- 15:00 – 15:30 Juan-Carlos Idrobo, *University of Washington, US*
STEM in Flatland-An Adventure of Many Dimensions

15:30 – 16:00 Coffee break

Chair: Z. Wu

Session 11

- 16:00 – 16:30 Saleh Gorji, *Gatan/Ametek, München, DE*
Overcoming challenges in imaging beam-sensitive materials with direct detection cameras
- 16:30 – 17:00 Knut Müller-Caspary, *LMU Munich, DE*
Gradient based analysis and design of momentum-resolved STEM experiments
- 17:00 – 17:30 Viera Skákalová, *Slovak Academy of Sciences, SK*
Simple chemical approach to two-dimensional metal iodides/graphene heterostructures
- 17:30 – 18:00 Manling Sui, *Beijing University of Technology, CH*
In situ electron microscopy for electron radiolysis effect and dose dependence of functional metal oxides
- 18:00 – 18:30 Kristian Mølhave, *DTU Lyngby, DK*
Nanofluidic EM with Water in Nanochannels and with Eutectic Droplets on Nanowires



19:00 – 23:00 *Conference Dinner at Ulm University with life music*

Thursday, September 28th, Morning Sessions

Chair: C. Koch

Session 12

9:00 – 9:30

JEOL

9:30 – 10:00

Tatiana Latychevskaia, *Paul Scherer Institute, Villingen, CH,*

Quantitative Low-Energy Electron Coherent Imaging and Convergent Beam Electron Diffraction of 2D Materials

10:00 – 10:30

Jani Kotakoski, *Wien University, AT*

Creating and imaging quantum centers in diamond 2D materials

10:30 – 11:00

Xinliang Feng, *TU Dresden, DE,*

Advances in Organic 2D Crystals - From On-Water Surface Chemistry to Functional Applications

11:00 – 11:30

Coffee Break

Chair: J. Biskupek

Session 13

11:30 – 12:00

Michael Elbaum, *Weizman Institute, ISR*

Advances in Biological Cryo-EM by STEM

12:00 – 12:30

Joachim Mayer, *RWTH Aachen, DE*

The TOMO Project – Integrating a Fully Functional Atom Probe in an Aberration-Corrected TEM

12:30 – 13:15

Rafal Dunin-Borkowski, *FZ Jülich, DE*

Advanced transmission electron microscopy of two-dimensional magnetic materials & Outline of a European TEM infrastructure

13:15 – 14:00

Lunch

14:00 – 16:30

SALUTE

Session on the occasion of the 70th birthday of Ute Kaiser organized by Elena Besley

16:30 – 17:00

Fingerfood

Farewell and end of the Conference