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## Research outputs

### **Oxygen-Driven Metal–Insulator Transition in SrNbO<sub>3</sub> Thin Films Probed by Infrared Spectroscopy**

Di Pietro, P., Bigi, C., Chaluvadi, S. K., Knez, D., Rajak, P., Ciancio, R., Fujii, J., Mercuri, F., Lupi, S., Rossi, G., Borgatti, F., Perucchi, A. & Orgiani, P., Jul 2022, In: *Advanced Electronic Materials*. 8, 7, 2101338.

### **Atom by Atom analysis of complexoxide materials**

Knez, D., Kobald, A., Hofer, F. & Kothleitner, G., 21 Apr 2022.

### **How an ASEM Workshop led to a successful quantification for atomic-scale EELS maps**

Lammer, J., Löffler, S., Berger, C., Knez, D., Haberfehlner, G., Hofer, F., Bucher, E., Sitte, W. & Grogger, W., 21 Apr 2022

### **Remote PACBED Thickness Determination by CNNs**

Oberaigner, M., Weber, D., Clausen, A., Knez, D. & Kothleitner, G., 21 Apr 2022.

### **Vanadium and Manganese Carbonyls as Precursors in Electron-Induced and Thermal Deposition Processes**

Jungwirth, F., Knez, D., Porrati, F., Schuck, A. G., Huth, M., Plank, H. & Barth, S., 1 Apr 2022, In: *Nanomaterials*. 12, 7, 1110.

### **In Situ Study of Nanoporosity Evolution during Dealloying AgAu and CoPd by Grazing-Incidence Small-Angle X-ray Scattering**

Gößler, M., Hengge, E., Bogar, M., Albu, M., Knez, D., Amenitsch, H. & Würschum, R., 3 Mar 2022, In: *The Journal of Physical Chemistry C*. 126, 8, p. 4037–4047 11 p.

### **HAADF STEM and Ab Initio Calculations Investigation of Anatase TiO<sub>2</sub>/LaAlO<sub>3</sub> Heterointerface**

Islam, M., Rajak, P., Knez, D., Chaluvadi, S. K., Orgiani, P., Rossi, G., Dražić, G. & Ciancio, R., 1 Feb 2022, In: *Applied Sciences*. 12, 3, 1489.

### **Revisiting the carbon mesopore contribution towards improved performance of ionic liquid–based EDLCs at sub-zero temperatures**

Pavlenko, V., Kalybekkyzy, S., Knez, D., Abbas, Q., Mansurov, Z., Bakenov, Z. & Ng, A., Feb 2022, In: *Ionics*. 28, 2, p. 893-901 9 p.

### **A Lithium-Silicon Microbattery with Anode and Housing Directly Made from Semiconductor Grade Monocrystalline Si**

Sternad, M., Hirtler, G., Sorger, M., Knez, D., Karlovsky, K., Forster, M. & Wilkening, H. M. R., 2022, In: *Advanced Materials Technologies*. 7, 3, 2100405.

### **A method for a column-by-column EELS quantification of barium lanthanum ferrate**

Lammer, J., Berger, C., Löffler, S., Knez, D., Longo, P., Kothleitner, G., Hofer, F., Haberfehlner, G., Bucher, E., Sitte, W. & Grogger, W., 2022, In: *Ultramicroscopy*. 234, 9 p., 113477.

### **Challenges in the characterization of complex nanomaterials with analytical STEM**

Knez, D., Lammer, J., Oberaigner, M., Simic, N., Haberfehlner, G., Fisslthaler, E., Krisper, R., Radlinger, T., Grogger, W., Hofer, F. & Kothleitner, G., 2022, *16MCM*. p. 80

### **Field induced oxygen vacancy migration in anatase thin films studied by in situ biasing TEM**

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#### **Field induced oxygen vacancy migration in anatase thin films studied by in situ biasing TEM**

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#### **Orbital mapping of the LaAlO<sub>3</sub>-TiO<sub>2</sub> interface by STEM-EELS**

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#### **Phase Analysis of (Li)FePO<sub>4</sub> by Selected Area Electron Diffraction in Transmission Electron Microscopy**

Simic, N., Knez, D., Hanzu, I. & Grogger, W., 2022.

#### **Phase Analysis of (Li)FePO<sub>4</sub> by Selected Area Electron Diffraction in Transmission Electron Microscopy**

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#### **Precursors for Direct-Write Nanofabrication with Electrons**

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#### **Quantifying Ordering Phenomena at the Atomic Scale in Rare Earth Oxide Ceramics via EELS Elemental Mapping**

Lammer, J., Berger, C., Löffler, S., Knez, D., Bucher, E., Haberfehlner, G., Kothleitner, G., Hofer, F., Sitte, W. & Grogger, W., 2022, *16MCM*. p. 371-372

#### **Rise to the occasion – high quality sample preparation for high resolution TEM**

Dienstleder, M., Krisper, R., Lammer, J., Knez, D., Fisslthaler, E. & Kothleitner, G., 2022, *16MCM*. p. 170-171

#### **Single Source Precursors in FEBID and FIBID: Similarities and Differences for CoSix Deposition**

Jungwirth, F., Porrati, F., Knez, D., Plank, H., Huth, M. & Barth, S., 2022.

#### **Single Source Precursors in FEBID and FIBID: Similarities and Differences for CoSix Deposition**

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#### **The power of speed: DED EELS for analytical in situ TEM**

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#### **The power of speed: DED EELS for analytical in situ TEM**

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#### **Iron-rich talc as air-stable platform for magnetic two-dimensional materials**

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#### **Evidence of Mn-Ion Structural Displacements Correlated with Oxygen Vacancies in La<sub>0.7</sub>Sr<sub>0.3</sub>MnO<sub>3</sub> Interfacial Dead Layers**

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#### **Automatic indexing of two-dimensional patterns in reciprocal space**

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**Negatively Charged In-Plane and Out-Of-Plane Domain Walls with Oxygen-Vacancy Agglomerations in a Ca-Doped Bismuth-Ferrite Thin Film**

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**A New Way Of Combining Solar Energy Conversion And Storage**

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**Pulsed laser deposition of oxide and metallic thin films by means of Nd:YAG laser source operating at its 1st harmonics: Recent approaches and advances**

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**Dislocations in ceramic electrolytes for solid-state Li batteries**

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**Co<sup>3+</sup>/La<sup>3+</sup> Cross-Diffusion at the Li<sub>7</sub>La<sub>3</sub>Zr<sub>2</sub>O<sub>12</sub>|LiCoO<sub>2</sub> Interface**

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**High Resolution STEM Simulations of Beryl Crystal Impurities Using Multislice Methods (QSTEM)**

Simic, N., Knez, D. & Hofer, F., 2021, *ASEM-Workshop 2021*. Linz, p. 17

**Post-Processing Paths for Orbital Mapping by STEM-EELS**

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**Post-processing paths for orbital mapping of rutile by STEM-EELS**

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**New Solar Cell-Battery Hybrid Energy System: Integrating Organic Photovoltaics with Li-Ion and Na-Ion Technologies**

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### **Helium droplet assisted synthesis of plasmonic Ag@ZnO core@shell nanoparticles**

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### **Unveiling Oxygen Vacancy Superstructures in Reduced Anatase Thin Films**

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### **Thermally Induced Diffusion and Restructuring of Iron Triade (Fe, Co, Ni) Nanoparticles Passivated by Several Layers of Gold**

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### **Ultrashort XUV pulse absorption spectroscopy of partially oxidized cobalt nanoparticles**

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### **Tuning the Optical Absorption of Anatase Thin Films Across the Visible-To-Near-Infrared Spectral Region**

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### **Study on Ca Segregation toward an Epitaxial Interface between Bismuth Ferrite and Strontium Titanate**

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### **Phase segregation in NiAu-nanoalloys induced by swift electrons**

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### **Quantifying ordering phenomena in lanthanum barium ferrate at the atomic scale**

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### **Structural characterization of poly-Si Films crystallized by Ni Metal Induced Lateral Crystallization**

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### **Effects of the Core Location on the Structural Stability of Ni-Au Core-Shell Nanoparticles**

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**Towards new plasmonic materials: Synthesis of K and K-Au nanoparticles with helium nanodroplets**

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**Helium nanodroplet assisted synthesis of bimetallic Ag@Au nanoparticles with tunable localized surface plasmon resonance**

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**Atomic Structure Analysis of Ba<sub>1.1</sub>La<sub>1.9</sub>Fe<sub>2</sub>O<sub>7</sub> Using High-Resolution STEM**

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**Ca Segregation Towards the Interface in Bismuth Ferrite Thin Films**

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**On the Impact of Swift Electrons on Mass Transport Phenomena at the Nanoscale**

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**Synthesis of nanosized vanadium(v) oxide clusters below 10 nm**

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**Atomic Structure Analysis of a 2nd Order Ruddlesden-Popper Ferrite – a High-resolution STEM Study**

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**Electron Beam Induced Dynamics in Experiment and Simulation**

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**IMPACT OF OXYGEN VACANCIES ON ELEC-TRONIC PROPERTIES OF ANATASE THIN FILMS**

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### **Ultra-thin h-BN substrates for nanoscale plasmon spectroscopy**

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### **On the Unexpected Alloying Behaviour of Ni-Au and Co-Au Core-Shell Nanoparticles,**

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### **Core-Shell Nanoparticles for Plasmonics and Catalysis**

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### **Core-shell nanoparticles prepared in superfluid helium droplets: structure, phase transitions, and alloy formation**

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### **Plasmon spectroscopy of metallic nanoparticles on ultra-thin h-BN films**

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### **Thermally induced alloying process in core@shell AgAu particles: A new method to measure diffusion on the nanoscale**

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### **To be or not to be alloyed: The unexpected behaviour of Ni-Au and Co-Au core-shell nanoparticles upon heating**

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### **Functional plasmonic nanostructures obtained from helium droplet synthesis**

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### **Ultra-thin h-BN films employed as STEM substrates for nanoscale plasmon spectroscopy**

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### **Electron Beam Driven Dynamics in Experiment and Simulation**

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**Stability of Core-Shell Nanoparticles for Catalysis at Elevated Temperatures: Structural Inversion in the Ni-Au System Observed at Atomic Resolution**

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**Atoms in Motion: Electron beam induced dynamics in experiment and simulation**

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**Synthesis of Nanoparticles in Helium Droplets - a Characterization Comparing Mass-Spectra and Electron Microscopy Data**

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**Vortex Assisted Growth of Metallic Nanowires in Superfluid Helium Droplets**

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**Formation of bimetallic core-shell nanowires along vortices in superfluid He nanodroplets**

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### **HR-STEM investigations of metallic nanoparticles grown with superfluid He-droplets**

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### **HR-STEM investigations of metallic nanoparticles grown with superfluid He-droplets**

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### **HR-STEM investigations of metallic nanoparticles grown with superfluid He-droplets**

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### **Formation of mono- and bi-metallic nanowires in vortices in superfluid He nanodroplets**

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### **HR-STEM investigations of metallic nanoparticles grown with superfluid He-droplets**

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### **HR-STEM investigations of metallic nanoparticles grown with superfluid He-droplets**

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### **HR-STEM investigations of metallic nanoparticles grown with superfluid He-droplets**

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### **HR-STEM investigations of metallic nanoparticles grown with superfluid He-droplets**

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### **Preparation and Electron Microscopy of Graphene**

Knez, D., Fisslthaler, E. & Hofer, F., 25 Apr 2013.

### **Preparation and Electron Microscopy of Graphene**

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## **Activities**

### **Challenges in the characterization of complex nanomaterials with analytical STEM**

Daniel Knez (Speaker)

4 Sep 2022 → 9 Sep 2022

### **Photoemission Electron Microscopy of Plasmonic Nanoparticles and Nanostructures**

Florian Lackner (Speaker), Thomas Jauk (Contributor), Alexander Schiffmann (Contributor), Kazma Komatsu (Contributor), H. Ditlbacher (Contributor), Joachim R. Krenn (Contributor), Zsuzsanna Papa (Contributor), Peter Dombi (Contributor), Harald Matthias Fitzek (Contributor), Daniel Knez (Contributor), Ferdinand Hofer (Contributor), C Denker (Contributor), J Walowski (Contributor), Markus Münzenberg (Contributor), Martin Sterrer (Contributor), Martin Schultze (Contributor) & Wolfgang Ernst (Contributor)

25 Oct 2021

### **3D Nano-Printing of Plasmonically Active Gold-Nanoantennas**

David Kuhness (Speaker), Daniel Knez (Contributor), Georg Haberfehlner (Contributor), Alexander Gruber (Contributor), Harald Matthias Fitzek (Speaker), Robert Winkler (Contributor), Gerald Kothleitner (Speaker) & Harald Plank (Contributor)

27 Sep 2021

### **Post-processing procedure for orbital mapping of rutile by STEM-EELS**

Michael Oberaigner (Speaker), Daniel Knez (Speaker), Stefan Löffler (Speaker) & Gerald Kothleitner (Speaker)  
22 Aug 2021 → 26 Aug 2021

### **Structure of Periodic Oxygen Vacancy Arrays in Anatase Thin Films**

Daniel Knez (Speaker)  
20 Nov 2020 → 26 Nov 2020

### **Attosecond Spectroscopy of Ultrafast Carrier Dynamics in Nanoparticles**

Florian Lackner (Speaker), J.A. Gessner (Contributor), Florian Siegrist (Contributor), Alexander Schiffmann (Contributor), Roman Messner (Contributor), Maximilian Ingo Lasserus (Contributor), Martin Schnedlitz (Contributor), Benjamin W Toulson (Contributor), Daniel Knez (Contributor), Ferdinand Hofer (Contributor), Oliver Gessner (Contributor), Wolfgang Ernst (Contributor) & Martin Schultze (Contributor)  
16 Nov 2020 → 19 Nov 2020

### **Atoms in Motion: Electron Beam Induced Dynamics in Experiment and Simulation**

Daniel Knez (Speaker)  
12 Dec 2019

### **Atoms in Motion: On the Impact of Swift Electrons on Mass Transport Phenomena at the Nanoscale**

Daniel Knez (Speaker)  
28 Jun 2019

### **Nanomaterials Synthesized in Helium Droplets**

Wolfgang Ernst (Contributor), Andreas Hauser (Speaker), Florian Lackner (Contributor), Daniel Knez (Contributor) & Ferdinand Hofer (Contributor)  
30 May 2019 → 1 Jun 2019

### **Towards new plasmonic materials: Synthesis of K and K-Au nanoparticles with helium nanodroplets**

Roman Messner (Speaker), Daniel Knez (Contributor), Ferdinand Hofer (Contributor), Wolfgang E. Ernst (Contributor) & Florian Lackner (Contributor)  
19 May 2019 → 22 May 2019

### **On the Unexpected Alloying Behaviour of Ni-Au and Co-Au Core-Shell Nanoparticles**

Andreas Hauser (Speaker), Martin Schnedlitz (Contributor), Maximilian Ingo Lasserus (Contributor), Ralf Meyer (Contributor), Wolfgang E. Ernst (Contributor), Daniel Knez (Contributor), Ferdinand Hofer (Contributor), R. Fernandez-Perea (Contributor) & María Pilar De Lara-Castells (Contributor)  
3 Dec 2018 → 5 Dec 2018

### **Electron beam induced dynamics of atoms and clusters**

Ferdinand Hofer (Speaker), Daniel Knez (Contributor), Georg Haberfehlner (Contributor), Gerald Kothleitner (Contributor), Wolfgang E. Ernst (Contributor) & Paul Midgley (Contributor)  
16 Oct 2018

### **Core-Shell Nanoparticles for Plasmonics and Catalysis**

Alexander Schiffmann (Contributor), Martin Schnedlitz (Contributor), Maximilian Ingo Lasserus (Contributor), Roman Messner (Contributor), Florian Lackner (Contributor), Andreas Hauser (Contributor), Daniel Knez (Contributor), Ferdinand Hofer (Contributor) & Wolfgang E. Ernst (Speaker)  
15 Oct 2018 → 17 Oct 2018

### **Helium droplet synthesis as a new route to plasmonic nanoparticles and nanostructures**

Florian Lackner (Speaker), Alexander Schiffmann (Contributor), Roman Messner (Contributor), Maximilian Ingo Lasserus (Contributor), Martin Schnedlitz (Contributor), Harald Matthias Fitzek (Contributor), Peter Pölt (Contributor), Daniel Knez (Contributor), Gerald Kothleitner (Contributor) & Wolfgang E. Ernst (Contributor)  
12 Oct 2018

**Core-shell nanoparticles prepared in superfluid helium droplets: structure, phase transitions, and alloy formation**

Alexander Schiffmann (Contributor), Martin Schnedlitz (Contributor), Maximilian Ingo Lasserus (Contributor), Roman Messner (Contributor), Florian Lackner (Contributor), Ralf Meyer (Contributor), Andreas Hauser (Contributor), Daniel Knez (Contributor), Ferdinand Hofer (Contributor) & Wolfgang E. Ernst (Speaker)

8 Oct 2018 → 12 Oct 2018

**Helium Nanodroplet Based Synthesis of Tailored Nanoparticles for Surface Enhanced Raman Spectroscopy**

Florian Lackner (Speaker), Alexander Schiffmann (Contributor), Maximilian Ingo Lasserus (Contributor), Roman Messner (Contributor), Martin Schnedlitz (Contributor), Harald Matthias Fitzek (Contributor), Peter Pöhl (Contributor), Daniel Knez (Contributor), Ferdinand Hofer (Contributor) & Wolfgang E. Ernst (Contributor)

11 Sep 2018

**Plasmon spectroscopy of metallic nanoparticles on ultra-thin h-BN films**

Alexander Schiffmann (Speaker), Daniel Knez (Contributor), Florian Lackner (Contributor), Maximilian Ingo Lasserus (Contributor), Roman Messner (Contributor), Martin Schnedlitz (Contributor), Ferdinand Hofer (Contributor) & Wolfgang E. Ernst (Contributor)

11 Sep 2018

**Thermally induced alloying process in core@shell AgAu particles: A new method to measure diffusion on the nanoscale**

Maximilian Ingo Lasserus (Speaker), Martin Schnedlitz (Contributor), Andreas Hauser (Contributor), Daniel Knez (Contributor), Roman Messner (Contributor), Alexander Schiffmann (Contributor), Florian Lackner (Contributor), Ferdinand Hofer (Contributor) & Wolfgang E. Ernst (Contributor)

11 Sep 2018

**To be or not to be alloyed: The unexpected behaviour of Ni-Au and Co-Au core-shell nanoparticles upon heating**

Martin Schnedlitz (Speaker), Daniel Knez (Contributor), Ralf Meyer (Contributor), Maximilian Ingo Lasserus (Contributor), Roman Messner (Contributor), Alexander Schiffmann (Contributor), Florian Lackner (Contributor), Andreas Hauser (Contributor), Ferdinand Hofer (Contributor) & Wolfgang E. Ernst (Contributor)

11 Sep 2018

**Atoms in Motion: Electron Beam Induced Dynamics in Experiment and Simulation**

Daniel Knez (Speaker)

9 Sep 2018 → 14 Sep 2018

**Functional plasmonic nanostructures obtained from helium droplet synthesis**

Florian Lackner (Speaker), Alexander Schiffmann (Contributor), Maximilian Ingo Lasserus (Contributor), Roman Messner (Contributor), Martin Schnedlitz (Contributor), Harald Matthias Fitzek (Contributor), Peter Pöhl (Contributor), Daniel Knez (Contributor), Ferdinand Hofer (Contributor) & Wolfgang E. Ernst (Contributor)

30 Aug 2018

**Ultra-thin h-BN films employed as STEM substrates for nanoscale plasmon spectroscopy**

Alexander Schiffmann (Speaker), Daniel Knez (Contributor), Florian Lackner (Contributor), Maximilian Ingo Lasserus (Contributor), Roman Messner (Contributor), Martin Schnedlitz (Contributor), Ferdinand Hofer (Contributor) & Wolfgang E. Ernst (Contributor)

30 Aug 2018

**Atoms in Motion: Electron Radiation Dynamics**

Daniel Knez (Speaker)

26 Apr 2018 → 27 Apr 2018

**Plasmonic Properties of Ag@Au core@shell Nanoparticles and Nanostructures Formed by Helium Droplet Synthesis**

Florian Lackner (Speaker), Alexander Schiffmann (Contributor), Martin Schnedlitz (Contributor), Maximilian Ingo Lasserus (Contributor), Roman Messner (Contributor), Wolfgang E. Ernst (Contributor), Harald Matthias Fitzek (Contributor), Peter Pöhl (Contributor), Daniel Knez (Contributor) & Ferdinand Hofer (Contributor)

7 Feb 2018

**Atoms in motion: electron beam induced dynamics of metallic clusters in experiment & simulation**

Daniel Knez (Speaker), Evelin Fisslthaler (Contributor), Ferdinand Hofer (Contributor), Martin Schnedlitz (Contributor), Maximilian Ingo Lasserus (Contributor), Alexander Schiffmann (Contributor) & Wolfgang E. Ernst (Contributor)  
6 Feb 2018

**Temperature studies of Ni@Au and Co@Au core@shell systems on the nanoscale**

Alexander Schiffmann (Speaker), Martin Schnedlitz (Contributor), Ralf Meyer (Contributor), Maximilian Ingo Lasserus (Contributor), Roman Messner (Contributor), Florian Lackner (Contributor), Andreas Hauser (Contributor), Wolfgang E. Ernst (Contributor), Daniel Knez (Contributor) & Ferdinand Hofer (Contributor)  
6 Feb 2018

**On the stability of Ag-Au and Ni-Au core-shell particles at elevated temperatures: diffusion, oxidation and structural inversion at atomic resolution**

Martin Schnedlitz (Speaker), Maximilian Ingo Lasserus (Contributor), Ralf Meyer (Contributor), Roman Messner (Contributor), Alexander Schiffmann (Contributor), Florian Lackner (Contributor), Wolfgang E. Ernst (Contributor), Andreas Hauser (Contributor), Daniel Knez (Contributor) & Ferdinand Hofer (Contributor)  
5 Feb 2018

**Austrian Society for Electron Microscopy (External organisation)**

Mihaela Albu (Member), Evelin Fisslthaler (Member), Harald Matthias Fitzek (Member), Werner Grogger (Member), Georg Haberfehlner (Member), Ferdinand Hofer (Member), Daniel Knez (Member), Gerald Kothleitner (Member), Robert Krisper (Member), Judith Lammer (Member), Ilse Letofsky-Papst (Member), Claudia Mayrhofer (Member), Stefan Mitsche (Member), Manfred Nachtnebel (Member), Harald Plank (Member), Johannes Rattenberger (Member), Sebastian Rauch (Member), Jürgen Sattelkow (Member), Hartmuth Schröttner (Member), Cornelia Trummer (Member), Karin Wewerka (Member), Robert Winkler (Member) & Armin Zankel (Member)  
2018 → ...

**Richard Drummond-Brydson**

Daniel Knez (Host) & Ferdinand Hofer (Host)  
29 Nov 2017 → 1 Dec 2017

**Direct Imaging of Channel Constituents in Beryl**

Ferdinand Hofer (Speaker), Christian Gspan (Contributor), Daniel Knez (Speaker), Harald Matthias Fitzek (Contributor), Werner Grogger (Contributor) & Karl Gatterer (Contributor)  
12 Nov 2017 → 17 Nov 2017

**In situ studies of high-purity mono- and bimetallic nanostructures in experiment and simulation**

Daniel Knez (Speaker)  
21 Aug 2017 → 25 Aug 2017

**Electron Beam Induced Dynamics of Atoms and Clusters-Experiments and Simulations**

Ferdinand Hofer (Speaker) & Daniel Knez (Contributor)  
30 Apr 2017 → 4 May 2017

**The 16th European Microscopy Congress**

Daniel Knez (Speaker)  
28 Aug 2016 → 2 Sep 2016

**Materials Day 2015**

Daniel Knez (Speaker)  
28 Sep 2015

**12th Multinational Conference on Microscopy 2015**

Daniel Knez (Speaker)  
8 Sep 2015

**International Microscopy Congress 2014**

Daniel Knez (Speaker)

7 Sep 2014

**Prizes**

**Best Young Lecturer Award**

Knez, Daniel (Recipient), 28 Aug 2015

**Instrumentation Session Best Poster Award**

Knez, Daniel (Recipient), 28 Sep 2017

**Scholarship of the Società Italiana Scienze Microscopiche (SISM)**

Knez, Daniel (Recipient), Sep 2019