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## Research outputs

### Three-dimensional distribution of individual atoms in the channels of beryl

Knez, D., Gspan, C., Simic, N., Mitsche, S., Fitzek, H., Gatterer, K., Wiltsche, H., Kothleitner, G., Grogger, W. & Hofer, F., Dec 2024, In: Communications Materials. 5, 1, 9 p., 19.

### Gas-Phase Synthesis of Iron Silicide Nanostructures Using a Single-Source Precursor: Comparing Direct-Write Processing and Thermal Conversion

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### A Guideline to Mitigate Interfacial Degradation Processes in Solid-State Batteries Caused by Cross Diffusion

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### Impact of Iodine Electrodeposition on Nanoporous Carbon Electrode Determined by EQCM, XPS and In Situ Raman Spectroscopy

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### Getting a grip on in situ biasing – A clean method for sample preparation for in situ biasing TEM experiments

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### Online Thickness Determination with Position Averaged Convergent Beam Electron Diffraction using Convolutional Neural Networks

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### A Colloidal Synthesis Route Towards AgBiS<sub>2</sub> Nanocrystals Based on Metal Xanthate Precursors

Vakalopoulou, E., Knez, D., Sigl, M., Kothleitner, G., Trimmel, G. & Rath, T., Feb 2023, In: ChemNanoMat. 9, 2, e202200414.

### 2D and 3D STEM Imaging and Spectroscopy: Applications and Perspectives in View of Novel STEM Infrastructure

Kothleitner, G., Dienstleider, M., Fisslthaler, E., Grogger, W., Haberfehlner, G., Knez, D., Lammer, J., Letofsky-Papst, I., Mairhofer, T., Oberaigner, M. & Wewerka, K., 2023, *Workshop on Advanced Electron Microscopy*. p. 17

### Behavior of Halogens in the Absorber Layer of Conventional and Inverted Organic Solar Cells

Zuccala, E., Rath, T., Haberfehlner, G., Knez, D., Mayrhofer, C., Fürk, P., Canteri, R., Barozzi, M., Hanzu, I. & Trimmel, G., 2023.

### Bimetallic precursors for focused particle-based deposition

Barth, S., Jungwirth, F., Porrati, F., Huth, M., Knez, D. & Plank, H., 2023, *fit4nano Workshop*. Lissabon, p. 41 1 p.

### Combining Energy Harvesting and Storage Into a Single Device

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### Exploring the two-dimensional electron gas at TiO<sub>2</sub>/LaAlO<sub>3</sub> interface using advanced electron microscopy techniques

Oberaigner, M., Knez, D., Ederer, M., Chaluvadi, S. K., Orgiani, P., Ciancio, R., Löffler, S. & Kothleitner, G., 2023, *Scientific Innovation and convergence through Microscopy Platform*. p. 385

**Getting a grip on in situ biasing – A clean method for sample preparation for in situ biasing TEM experiments**  
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**One Device to Unite Them All**

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**Phase analysis of (Li)FePO<sub>4</sub> by selected area electron diffraction and integrated differential phase contrast imaging**  
Simic, N., Knez, D., Hanzu, I. & Grogger, W., 2023, p. 93-94.

**Phase analysis of (Li)FePO<sub>4</sub> by selected area electron diffraction and integrated differential phase contrast imaging**  
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**Quantitative Analysis of Individual Atoms in the Channels of Beryl**

Knez, D., Gspan, C., Simic, N., Mitsche, S., Fitzek, H. M., Kothleitner, G., Grogger, W. & Hofer, F., 2023, p. 553-554.

**Quantitative imaging of single cesium atoms in the channels of a Beryl crystal**

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**Focused Ion Beam vs Focused Electron Beam Deposition of Cobalt Silicide Nanostructures Using Single-Source Precursors: Implications for Nanoelectronic Gates, Interconnects, and Spintronics**

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**Aberration-Corrected STEM Characterisation of Mn-ion Structural Displacements in La<sub>0.7</sub>Sr<sub>0.3</sub>MnO<sub>3</sub> Interfacial Dead-Layers**

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**Mixed-metal nanoparticles: phase transitions and diffusion in Au-VO clusters**

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**Remote PACBED Thickness Determination by CNNs**

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**Orbital mapping of the  $\text{LaAlO}_3\text{-TiO}_2$  interface by STEM-EELS**

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**Quantifying Ordering Phenomena at the Atomic Scale in Rare Earth Oxide Ceramics via EELS Elemental Mapping**  
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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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**Post-Processing Paths for Orbital Mapping by STEM-EELS**

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**Phase segregation in NiAu-nanoalloys induced by swift electrons**  
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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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### **Preparation and Electron Microscopy of Graphene**

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## **Activities**

### **Field induced oxygen vacancy migration in anatase thin films**

Daniel Knez (Speaker)  
3 Sept 2023 → 7 Sept 2023

### **Quantitative Analysis of Individual Atoms in the Channels of Beryl**

Daniel Knez (Speaker)  
3 Sept 2023 → 7 Sept 2023

### **Combining Energy Harvesting and Storage Into a Single Device**

Elena Zuccala (Speaker), Anna Jodlbauer (Contributor), Georg Haberfehlner (Contributor), Daniel Knez (Contributor), Thomas Rath (Contributor), Ilie Hanzu (Contributor) & Gregor Trimmel (Contributor)  
13 Apr 2023

### **Microscopy Conference 2023**

Daniel Knez (Participant)  
26 Feb 2023 → 2 Mar 2023

### **Visualizing cellulose chains with cryo scanning transmission electron microscopy**

Daniel Knez (Speaker)  
23 Feb 2023 → 2 Mar 2023

### **Phase Transitions on Alloying of Mixed-Metallic Nanoparticles**

Wolfgang Ernst (Speaker), Florian Lackner (Contributor), Daniel Knez (Contributor), Ferdinand Hofer (Contributor) & Andreas Hauser (Contributor)  
26 Sept 2022 → 30 Sept 2022

**Synthesis and investigation of sub-10 nm metal-semiconductor particles with core-shell and core-multi-shell structure**  
Florian Lackner (Speaker), Roman Messner (Contributor), Florian Küstner (Contributor), Lisa Sullmann (Contributor), Daniel Knez (Contributor), Ferdinand Hofer (Contributor), Gerald Kothleitner (Contributor) & Wolfgang Ernst (Contributor)  
26 Sept 2022 → 30 Sept 2022

**Challenges in the characterization of magnetic materials with DPC**  
Daniel Knez (Speaker)  
25 Sept 2022 → 27 Sept 2022

**Mixed-metallic Nanoparticles: Phase Transitions and Diffusion in Au-VO Clusters**  
Wolfgang Ernst (Speaker), Maximilian Ingo Lasserus (Contributor), Daniel Knez (Contributor), Ferdinand Hofer (Contributor) & Andreas Hauser (Contributor)  
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**Challenges in the characterization of complex nanomaterials with analytical STEM**  
Daniel Knez (Speaker)  
4 Sept 2022 → 9 Sept 2022

**Mixed metal clusters - core-shell structures, phase transitions, and nano alloying**  
Wolfgang Ernst (Speaker), Andreas Hauser (Contributor), Florian Lackner (Contributor), Daniel Knez (Contributor) & Ferdinand Hofer (Contributor)  
6 Jun 2022 → 10 Jun 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 Domki (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 Sept 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) &amp; 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) &amp; 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) &amp; 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) &amp; 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) &amp; 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) &amp; 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) &amp; 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 Pölt (Contributor), Daniel Knez (Contributor), Ferdinand Hofer (Contributor) &amp; Wolfgang E. Ernst (Contributor)

11 Sept 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) &amp; Wolfgang E. Ernst (Contributor)

11 Sept 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 Sept 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 Sept 2018

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

Daniel Knez (Speaker)

9 Sept 2018 → 14 Sept 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 Pölt (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 Pölt (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 Schrottner (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 Sept 2016

**Materials Day 2015**

Daniel Knez (Speaker)  
28 Sept 2015

**12th Multinational Conference on Microscopy 2015**

Daniel Knez (Speaker)  
8 Sept 2015

**International Microscopy Congress 2014**

Daniel Knez (Speaker)  
7 Sept 2014

**Prizes****Best Young Lecturer Award**

Knez, Daniel (Recipient), 28 Aug 2015

**Instrumentation Session Best Poster Award**

Knez, Daniel (Recipient), 28 Sept 2017

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

Knez, Daniel (Recipient), Sept 2019