

# Workshop “UT – FZJ Summit”

14<sup>th</sup> / 15<sup>th</sup> November 2023  
University of Twente Campus – UPark Hotel

## Agenda

### November 14, 2023

- 10:00 – 10:40 h **Arrival of FZJ Guests at Twente**  
*Parking 1 UT → UPark Hotel*  
(W. Meulenbergh, P. Behr)
- 10:45 – 11:10 h **Welcome and Introduction**  
*UPark Hotel – C3*  
(C. Bäumer, W.A. Meulenbergh)  
J. Herek – Welcome and Introduction UT  
W.A. Meulenbergh – Introduction FZJ
- 11:15 – 13:05 h **Session 1a – Inorganic Membrane Technologies**  
*UPark Hotel – C3 – (Michel Drazkowski)*
- 11:15 – 11:35 [Arian Nijmeijer](#) (IM-UT)  
*Overview of activities in the Inorganic Membranes group*
- 11:40 – 12:00 [Liudmila Fischer](#) (IEK1-FZJ)  
*Ceria-based composites for application in oxygen transport membranes*
- 12:05 – 12:25 [Jord Haven](#) (CPM-UT)  
*Reaction kinetics of ethane dehydrogenation for catalytic membrane reactor applications*
- 12:30 – 12:50 [Yuning Tang](#) (FZJ)  
*Strontium titanate based materials for the use as oxygen transport membrane in membrane reactors*
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- Session 1b – Topological Materials and Nanodevices**  
*UPark Hotel – C4 – (Jelle Ruiters)*
- 11:15 – 11:35 [Alexander Brinkman](#) (ICE-UT)  
*Topological quantum battery – theory and experiment*

- 11:40 – 12:00 – [Prateek Kaul](#) (PGI10-FZJ)  
*First steps of group-IV alloys for topological and spintronics applications*
- 12:05 – 12:25 [Dennis Klaassen](#) (PIN-UT)  
*Quantum spin hall states and topological phase transition in germanene*
- 12:30 – 12.50 [Femke Witmans](#) (ICE-UT)  
*Transport measurements in SnTe nanodevices*

12:55 – 14:30 h **Lunch Break and Exchange**  
*UPark Hotel Restaurant*

14:35 – 16:15 h **Session 2a – Advanced Materials for Next Generation Batteries**

*UPark Hotel – C3 – (Patrick Behr)*

- 14:35 – 14:55 [Dina Fattakhova](#) (FZJ-IEK1)  
*Oxide-ceramic solid state batteries*
- 15:00 – 15.20 [Konstantin Köster](#) (FZJ-IEK1)  
*Anionic redox to increase capacity in novel layered oxide cathode materials for sodium ion batteries*
- 15:25 – 15:45 [Jie Zheng](#) (IMS-UT)  
*Stabilizing spinel framework by hetero-interfacial lattice strain for high performance overlithiated  $\text{Li}_{1+x}\text{Mn}_2\text{O}_4$  cathode*
- 15:50 – 16:10 – [Kai Yao](#) (FZJ)  
*Study on grain boundaries of garnet electrolyte*

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**Session 2b – Superconducting Materials and Circuits**

*UPark Hotel – C4 – (Romar Avila)*

- 14:35 – 14:55 [Hans Hilgenkamp](#) (ICE-UT)  
*Energy-efficient neuromorphic circuitry: An opportunity for superconductivity?*
- 15:00 – 15.20 [Roudy Hanna](#) (PGI9-FZJ)  
*A stencil approach for superconducting circuits*
- 15:25 – 15:45 [Jelle Ruiters](#) (IMS-UT)  
*Superconducting  $\text{YBa}_2\text{Cu}_3\text{O}_7$  thin film growth on nanosheet-based templates*
- 15:50 – 16:10 [Anne Schmidt](#) (PGI9-FZJ)  
*Topological insulators for future quantum technologies*

- 16:15 – 17:30 h **Lab Tour (8 Groups)**  
*Location*  
(R. Avila, P. Behr)  
Participating UT groups
- 17:35 – 18:30 h **Interactive Poster Session**  
*UPark Hotel – C3 + 4*  
(R. Avila, P. Behr)
- 18:35 – 18:55 h **Break, Check-In Hotel**  
*Hotel*
- 19:00 – Open End **Get-Together + Dinner**  
*Location*

## **November 15, 2023**

08:30 – 08:50 h **Opening Day 2**  
*UPark Hotel – C3*  
(R. Avila, P. Behr)

08:55 – 10:35 h **Session 3a – Direct Air Capture of CO<sub>2</sub>**  
*UPark Hotel – C3 – (David Wolf)*

08:55 – 09:15 [Wim Brilman](#) (SPT-UT)  
*Developing DAC in Twente: Status and Challenges*

09:20 – 09:40 [Patrick Behr](#) (IEK1-FZJ)  
*Development of porous sorbents for direct capture of CO<sub>2</sub> from ambient air*

09:45 – 10:05 [Niels Mendel](#) (PCF-UT)  
*Cationic exchanged clays for CO<sub>2</sub>/CH<sub>4</sub> separation*

10:10 – 10:30 [Victor Sagel](#) (SPT-UT)  
*Water co-adsorption in direct air capture sorbent: understanding the role of sorption hysteresis on sorbent water loading*

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**Session 3b – Neuromorphic Computer Materials, Devices, and Architectures**

*UPark Hotel – C4 – (Roudy Hanna)*

08:55 – 09:15 [Alexandros Sarantopoulos](#) (PGI7-FZJ)  
*Rational design of redox-based memristive devices for neuromorphic computing*

09:20 – 09:40 [Reinier Cool](#) (NE-UT)  
*Electrostatic gating in dopant network processing units*

09:45 – 10:05 [Sebastian Siegel](#) (PGI14- FZJ)  
*In-memory neuromorphic computing for AI and beyond*

10:10 – 10:30 [Sander Smink](#) (ICE-UT)  
*Single-pulse control of 'trans-memristor' artificial synapses*

10:35 – 11:00 h **Coffee Break and Exchange**  
*UPark Hotel Restaurant*

11:05 – 12:45 h **Session 4a – Electrolyzers and Electrocatalysis**

*UPark Hotel – C3 – (Iris van den Bosch)*

11:05 – 11:25 [Christian Lenser](#) (IEK1-FZJ)  
*Solid oxide cells for electrolysis and power generation*

11:30 – 11:50 [Shreyas Harsha](#) (PCS-UT)  
*Dewetted Pt nanoparticles: The role of metal-support interaction in electrocatalytic hydrogen evolution reaction*

11:55 – 12:15 [Lisa Heymann](#) (PGI7-FZJ)  
*Materials sustainability and model electrocatalysts for water electrolysis*

12:20 – 12:40 [Ahmad Shaur](#) (IM-UT)  
*Development of cathode materials for high-temperature CO<sub>2</sub> electrolysis*

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**Session 4b – Low-Dimensional Nanomaterials and Surface Science**

*UPark Hotel – C4 – (Esther van de Logt)*

11:05 – 11:25 [Christian Tusche](#) (PGI6-FZJ)  
*Quantum materials in the spotlight of momentum microscopy: from symmetry to topology*

11:30 – 11:50 [Yasser Pordeli](#) (MCS-UT)  
*Self-aligned ohmic contact formation on 3D nanostructures*

11:55 – 12:15 [Regina Dittmann](#) (PGI7-FZJ)  
*Memristive HfO<sub>2</sub> in the nanoscale*

12:20 – 12:40 [Sebastiaan Haartsen](#) (PIN-UT)  
*Printing of 2D Materials*

12:45 – 13:45 h **Lunch Break and Exchange**

*UPark Hotel Restaurant*

13:50 – 14:35 h **Session 5a – Materials for Photovoltaics**

*UPark Hotel – C3 – (Junia Solomon)*

13:50 – 14:10 [Linn Leppert](#) (CCP-UT)

*First-principles-aided cartography of excitons in metal-halide perovskites*

14:15 – 14:35 [Lukas Frommel](#) (IEK5-FZJ)

*Transient photocurrent measurements for the characterization of perovskite solar cells*

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**Session 5b – Complex Oxide Thin Films**

*UPark Hotel – C4 – (Dimitris Spithouris)*

13:50 – 14:10 [Guus Rijnders](#) (IMS-UT)

*Asymmetric BaTiO<sub>3</sub> superlattices: epitaxial complex oxide thin film growth on silicon*

14:15 – 14:35 Max Buczek (PGI7-FZJ)

*Large area pulsed laser deposition for neuromorphic computing*

14:40 – 15:00

**Conclusion**

General discussion, suggestions, etc.

*UPark Hotel – C3*

(R. Avila, P. Behr)

15:00 h

**END**

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