

ENERGY TRANSITION The 8th HAST-Leopoldina Bilateral Symposium

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Date _

2025.1.14-1.15 / 09:30 a.m

14 - 15 January, Sungkyunkwan University (Seoul),
Sohyang Lecture Room (6F)



ENERGY TRANSITION

The 8th HAST-Leopoldina Bilateral Symposium

KAST 한국과학기술원
The Korean Academy of Science and Technology

The Korean Academy of Science and Technology (KAST)
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KAST 한국과학기술원
The Korean Academy of Science and Technology



Leopoldina
Nationale Akademie
der Wissenschaften

ENERGY

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DAY 1 _ JANUARY 14, 2025

09:00 - 09:30	Registration
09:30 - 10:00	<ul style="list-style-type: none"> Welcoming Remarks Hoon Taek LEE (Acting President of The Korean Academy of Science and Technology) Congratulatory Remarks Gerald HAUG (President of the German National Academy of Sciences Leopoldina) Opening Remarks Nam-Gyu PARK, Wolfgang MARQUARDT (Co-Chairs of Organizing Committee) Group Photo
	Opening Ceremony
◀ Session I ▶ Solar Energy - Chair : Nam-Gyu PARK	
10:00 - 10:20	Perovskite-based tandems : Perovskite/Si 2J and beyond <i>Jin Young KIM / Seoul National University</i>
10:20 - 10:40	How Materials Discovery Strategies can Accelerate the Development of Next Generation Solar Technologies <i>Christoph J. BRABEC / University of Erlangen-Nürnberg (FAU)</i>
10:40 - 11:00	Interface Control for Perovskite Solar Cells <i>Hui-Seon KIM / Inha University</i>
11:00 - 11:20	Organic Photovoltaics - Challenges and Opportunities <i>Karl LEO / Technische Universität Dresden</i>
11:20 - 11:50	Group Discussion
11:50 - 13:00	<i>Lunch</i>
◀ Session II ▶ Hydrogen Energy - Chair : Wolfgang MARQUARDT	
13:00 - 13:20	Atomically Dispersed Electrocatalysts for Water Electrolysis and Fuel Cells <i>Jinwoo LEE / KAIST</i>
13:20 - 13:40	Catalyst Design for Efficient Hydrogen Production & Storage in Chemical Hydrogen Carriers <i>Regina PALKOVITS / RWTH Aachen</i>
13:40 - 14:00	Study of Electrochemical Interfaces and Catalyst Materials for Hydrogen Energy Technology <i>WooChul JUNG / Seoul National University</i>
14:00 - 14:20	Chemical Hydrogen Storage - Systems, Challenges and Innovations <i>Peter WASSERSCHIED / University of Erlangen-Nürnberg</i>
14:20 - 14:50	Group Discussion
14:50 - 15:10	<i>Coffee Break</i>
◀ Session III ▶ Batteries - Chair : Wolfgang MARQUARDT	
15:10 - 15:30	Surface Chemistry of 2D Elementary Materials for Energy Storage Applications <i>Ho Seok PARK / Sungkyunkwan University</i>
15:30 - 15:50	Towards Realistic Solid-State Batteries : Overcoming Transport Limitations in Electrodes <i>Wolfgang ZEIER / University of Münster</i>
15:50 - 16:10	Reactive Metals for Large-scale, Seasonal Energy Storage <i>Stefano PASSERINI / Karlsruhe Institute for Technology (KIT)</i>
16:10 - 16:30	K-Battery Initiative and Some Research Outcomes <i>Kisuk KANG / Seoul National University</i>
16:30 - 17:00	Group Discussion
17:00 - 17:15	Concluding Remarks for the First Day <i>Nam-Gyu PARK & Wolfgang MARQUARDT</i>
18:30 - 21:00	Reception at the Invitation of the German Ambassador to the Republic of Korea

DAY 2 _ JANUARY 15, 2025

09:30 - 09:40	Welcoming Remarks for the Second Day <i>Nam-Gyu PARK (Co-Chair of Organizing Committee)</i>
◀ Session IV ▶ Grid Management - Chair : Wolfgang MARQUARDT	
9:40 - 10:00	Providing Flexibility with Distributed Energy Resources in DSO Circumstances <i>Dongjun WON / Inha University</i>
10:00 - 10:20	System Stability in Future Power System <i>Jutta HANSON / Darmstadt University of Technology</i>
10:20 - 10:40	How AI can Enhance Grid Operational Flexibility : Challenges and Opportunities <i>Hongseok KIM / Sogang University</i>
10:40 - 11:00	The Role of Digitalization in the Energy Transformation <i>Antonello MONTI / RWTH Aachen</i>
11:00 - 11:30	Group Discussion
11:30 - 12:30	<i>Lunch</i>
◀ Session V ▶ New Energy Sources (Fusion/Fission) - Chair : Jong Kyu PARK	
12:30 - 12:50	Charting viable Pathways for Fusion Energy in Korea <i>Jong Kyu PARK / Seoul National University</i>
12:50 - 13:10	Nuclear Fusion and the Optimized Stellarator Concept <i>Thomas KLINGER / Max Planck Institute for Plasma Physics</i>
13:10 - 13:30	SMR : A Vital Technology for Achieving Carbon Neutrality <i>Jeong Ik LEE / KAIST</i>
13:30 - 13:50	Perspectives on SMR Development within the Helmholtz Program NUSAFE <i>Thomas Walter TROMM / Karlsruhe Institute of Technology (KIT)</i>
13:50 - 14:20	Group Discussion
14:20 - 14:40	<i>Break</i>
14:40 - 15:40	Drafting Session on Policy Paper
15:40 - 16:00	Presentation of Key Recommendations by Experts of each group
16:00 - 16:15	Farewell Remarks <ul style="list-style-type: none"> Gerald Haug (President of the German National Academy of Sciences Leopoldina) Jin Ho Chung (President Elect of The Korean Academy of Science and Technology)
17:00 - 18:00	National Museum of Korean Contemporary History (1hr tour) / optional
18:00 - 19:30	Farewell Dinner

The 8th HAST-Leopoldina
Bilateral Symposium

Session I

SOLAR ENERGY



Chair

Nam-Gyu PARK

Speakers

Perovskite-based tandems : Perovskite/Si 2J and beyond

Jin Young KIM / Seoul National University

**How Materials Discovery Strategies can Accelerate the Development
of Next Generation Solar Technologies**

Christoph J. BRABEC / University of Erlangen-Nürnberg (FAU)

Interface Control for Perovskite Solar Cells

Hui-Seon KIM / Inha University

Organic Photovoltaics - Challenges and Opportunities

Karl LEO / Technische Universität Dresden

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Session II

HYDROGEN ENERGY



Chair

Wolfgang MARQUARDT

Speakers

Atomically Dispersed Electrocatalysts for Water Electrolysis and Fuel Cells

Jinwoo LEE / KAIST

Catalyst Design for Efficient Hydrogen Production & Storage in Chemical Hydrogen Carriers

Regina PALKOVITS / RWTH Aachen

Study of Electrochemical Interfaces and Catalyst Materials for Hydrogen Energy Technology

WooChul JUNG / Seoul National University

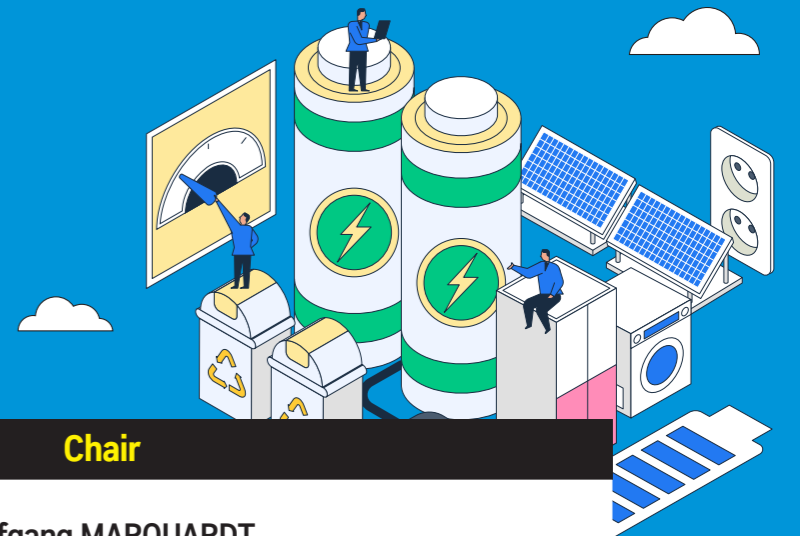
Chemical Hydrogen Storage - Systems, Challenges and Innovations

Peter WASSERSCHIED / University of Erlangen-Nürnberg

The 8th HAST-Leopoldina
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Session III

BATTERIES



Chair

Wolfgang MARQUARDT

Speakers

**Surface Chemistry of 2D Elementary Materials for
Energy Storage Applications**

Ho Seok PARK / Sungkyunkwan University

**Towards Realistic Solid-State Batteries :
Overcoming Transport Limitations in Electrodes**

Wolfgang ZEIER / University of Münster

Reactive Metals for Large-scale, Seasonal Energy Storage

Stefano PASSERINI / Karlsruhe Institute for Technology(KIT)

K-Battery Initiative and Some Research Outcomes

Kisuk KANG / Seoul National University



Prof. Dr.
Wolfgang ZEIER

Chair in Solid State Chemistry, Institute of Inorganic and Analytical Chemistry,
University of Münster, Münster

Towards Realistic Solid-State Batteries : Overcoming Transport Limitations in Electrodes

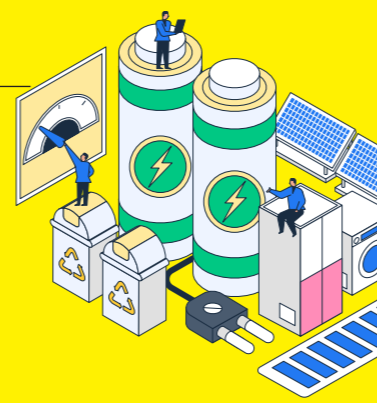
Wolfgang Zeier holds a chair in Solid State Chemistry at the University of Münster. In addition, he heads a department at the Helmholtz-Institute Münster, Research Center Jülich. His research interests encompass the fundamental structure-to-property relationships in solids, with a focus on phonon dynamics and ion-conducting materials, as well as solid-solid interfacial chemistry for all-solid-state batteries.



Memo.

Towards Realistic Solid-State Batteries : Overcoming Transport
Limitations in Electrodes

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Prof.
Kisuk KANG
Seoul National University

K-Battery Initiative and Some Research Outcomes

Prof. Kang is currently a professor at Seoul National University, Seoul, Korea, and the director of the Institute for Rechargeable Battery Innovation. His research focuses on materials design through a combined approach of experiments and ab initio calculations, specifically in materials for energy conversion and storage.

He began his professional career as an assistant professor in the Department of Materials Science and Engineering at KAIST (2008–2011) and joined Seoul National University in 2011, where he was later promoted to Full Professor. Prof. Kang has held several leadership roles, including Associate Dean of the College of Engineering (2019–2021), Director of the Center for Carborganic Energy Materials (Ministry of Trade, Industry, and Energy, 2017–2018), and Board Member of the Materials Research Society (2019–2022). He is currently a member of the Korean Academy of Science and the Korean Academy of Engineering.

Prof. Kang has received numerous prestigious awards, including the Scientist of the Month Award (Ministry of Science and Technology), the Energy and Environmental Science Lectureship Award (Royal Society of Chemistry), the Science Patriot Award (Korean Government), and the Young Engineer Award (2019). He was also recognized as one of the 100 Leaders in Technology by the National Academy of Engineering of Korea in 2017 and received the Young Scientist Award from the President of Korea in 2013. He has published over 350 scientific papers, including four publications in Science, with citations exceeding 50,000 and an H-index of 107.

Prof. Kang earned his B.S. degree from the Department of Materials Science and Engineering at Seoul National University and his Ph.D. from the Department of Materials Science and Engineering at the Massachusetts Institute of Technology (MIT), Cambridge, MA, in 2

Memo.

K-Battery Initiative and Some Research Outcomes

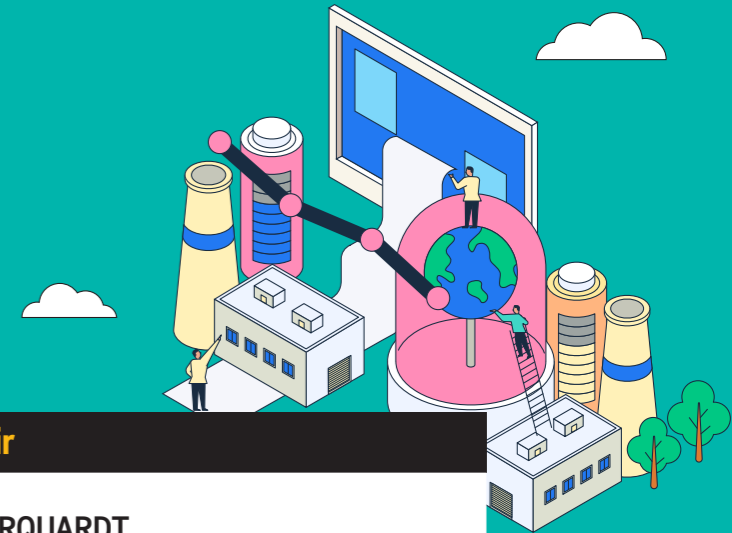
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Session IV

GRID MANAGEMENT



Chair

Wolfgang MARQUARDT

Speakers

**Providing Flexibility with Distributed
Energy Resources in DSO Circumstances**

Dongjun WON / Inha University

System Stability in Future Power System

Jutta HANSON / Darmstadt University of Technology

**How AI can Enhance Grid Operational Flexibility :
Challenges and Opportunities**

Hongseok KIM / Sogang University

The Role of Digitalization in the Energy Transformation

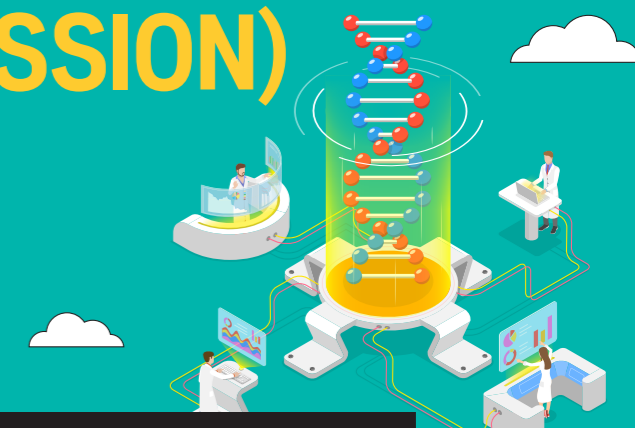
Antonello MONTI / RWTH Aachen

The 8th HAST-Leopoldina
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Session V

NEW ENERGY SOURCES (FUSION/FISSION)



Chair

Jong Kyu PARK

Speakers

Charting viable Pathways for Fusion Energy in Korea

Jong Kyu PARK / Seoul National University

Nuclear Fusion and the Optimized Stellarator Concept

Thomas KLINGER / Max Planck Institute for Plasma Physics

SMR : A Vital Technology for Achieving Carbon Neutrality

Jeong Ik LEE / KAIST

**Perspectives on SMR Development within the
Helmholtz Program NUSAFE**

Thomas Walter TROMM / Karlsruhe Institute of Technology (KIT)

