

# 8<sup>th</sup> WEEK OF THE YOUNG RESEARCHER

## CHEMICAL ENERGY STORAGE AND CONVERSION

German-Russian Institute  
of Advanced Technologies (GRIAT)  
Kazan National Research Technical University  
named after A. N. Tupolev – KAI

Kazan  
September 10–13, 2018

PROGRAMME

## **Conference Hotel**

### **Courtyard by Marriott Kazan Kremlin**

Karl-Marx str. 6, Kazan

Tel.:+7 843 210 0150

## **Conference Location**

### **Kazan National Research Technical University named after A. N. Tupolev – KAI**

### **German-Russian Institute of Advanced Technologies (GRIAT)**

Chetaeva str. 18a, Kazan

With financial support of



Federal Foreign Office

Welcome to the „8<sup>th</sup> German-Russian Week of the Young Researcher“!

Dear colleagues from Russia and Germany,

We are very delighted to welcome you to our Eighth Week of the Young Researcher! When we convened the “German-Russian Year of Science“, seven years ago, the idea was born to invite young researchers from both countries to come together to discuss current topics of mutual interest. Since then it has grown from strength to strength. The success of the first week in Kazan encouraged us to turn it into an annual event. The following years we met in Ekaterinburg (2012), Novosibirsk (2013), St. Petersburg (2014) and Moscow (2015 - 2017). The main goal of these meetings is to foster collaboration among young scientists and researchers who will be setting the agenda of scientific cooperation between Russia and Germany in the near future.

Research organizations and institutions of higher education of both our countries will be presenting their funding programmes and describing the platforms that they can offer to both Russian and German PhD students and Postdoctoral researchers. The overarching principle behind these presentations is to facilitate collaboration and to establish and broaden research networks. The week will illustrate how young and experienced scientists can work across borders with local authorities, associations and industry in order to develop new approaches to global challenges.

Together with experts and young scientists, we will discuss particular topics of interest in chemical energy storage and conversion. Given the growing population and rising living standards, the world is faced with an increasing demand for energy. In fact, fossil fuels are not a sustainable resource and the natural reservoirs are limited. In all future scenarios, chemical energy storage and conversion plays a vital role to satisfy the increasing demand for energy. Innovative concepts offer opportunities for new processes without increasing harmful emissions of carbon dioxide (CO<sub>2</sub>). Chemical research is the key for a fundamental understanding of energy conversion and it opens the door to a broad range of future technologies. Special emphasize will be given on the challenges for improved materials and processes and their potential impact on existing and future applications and innovation. The organizers strive for a good mix of participants at different career stages and different fields of expertise that include contributions from Materials Chemistry, Physical Chemistry, Process and Chemical Engineering, and Theory.

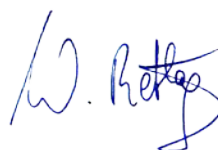
We would like to express our deepest gratitude to the German-Russian Institute of Advanced Technologies (GRIAT Kazan) at the National Research Technical Tupolev University (KNITU-KAI) for its academic hospitality and kind support. And, of course, we thank all of you, the participants, for your involvement and cooperation in this conference.

Dr Andreas Hoeschen



German Academic Exchange Service  
Head of DAAD Office Moscow  
Director of DWIH Moscow

Dr Wilma Rethage



German Research Foundation  
Head of DFG Office Moscow

<b>September 10, Monday</b>		
	Arrival of Participants, Transfer to the hotel, Check-in	
20:30	<p><b>Welcome Party</b></p> <p><b>Words of Welcome</b> to the participants of the week by</p> <ul style="list-style-type: none"> <li>• Dr Andreas Hoeschen, DWIH/DAAD Moscow</li> <li>• Dr Wilma Rethage, DFG Russia/CIS</li> <li>• Dr Tatiana Stanko, Vice-Rector of KNITU-KAI</li> </ul> <p>Introduction of the participants</p>	<p><b>by invitation</b></p> <p>Hotel <b>Mariott Kazan Musa Jalil Hall</b> <i>1<sup>st</sup> floor</i></p>
<b>September 11, Tuesday</b>		
09:20	Transfer from the Hotel to GRIAT	by bus
10:00	Registration of Participants	<i>Lobby, 1<sup>st</sup> floor</i>
10:00	Press Conference	
10:30	<p><b>Official Opening of the Week</b> with welcome addresses by</p> <ul style="list-style-type: none"> <li>• Professor Dr Albert Gilmutdinov, Rector of KNITU-KAI</li> <li>• Michael Dobis, Head of the Division for Science and Research, German Embassy Moscow</li> <li>• Christian Müller, Deputy Secretary General of the DAAD</li> <li>• Dr Johanna Kowol-Santen, Deputy Head of Department Scientific Affairs</li> </ul>	<i>Hall Tupolev, 2<sup>nd</sup> floor</i>
11:30 – 12:15	<p><b>Opening Lecture</b></p> <p>“Inorganic Materials for the Catalytic Generation and Chemical Storage of Hydrogen” <b>Professor Dr Malte Behrens</b> University of Duisburg-Essen</p> <p>– <i>Discussion</i> – (12:15-12:30)</p>	<i>Hall Tupolev, 2<sup>nd</sup> floor</i>

12:30	Conference Group Photo	
13:00	Lunch Break	<i>Cafeteria, 1<sup>st</sup> floor</i>
14:00	<b>Presentation of GRIAT</b> Dr Alsu Gilmetdinova, Director of GRIAT / Dr Sven Rost, Director of GRIAT	<i>Hall Silayev, 3<sup>d</sup> floor</i>
14:30	<b>Lecture:</b> "Alkali and Transition Metal Fluoride-Phosphates as Perspective Cathode materials for Metal-Ion Batteries" <b>Professor Dr Evgeny Antipov</b> Lomonosov Moscow State University  – Discussion –	<i>Hall Silayev, 3<sup>d</sup> floor</i>
15:00	<b>Lecture:</b> "Anode Materials for Sodium Ion Batteries" <b>Professor Dr Wolfgang Bensch</b> University of Kiel  – Discussion –	<i>Hall Silayev, 3<sup>d</sup> floor</i>
15:30	Coffee Break	<i>Recreation area in the 3<sup>d</sup> floor</i>
16:00-18:00	<b>Short Lectures of Young Researchers</b> 20 min  "Battery Related Model Studies with Ionic Liquids" <b>Dr Johannes Schnaidt</b> University of Ulm  "Novel Fluoride-Phosphate based High-Energy Cathode Materials for the Next Generation of Rechargeable Batteries" <b>Dr Stanislav Fedotov</b> Skoltech Moscow / Moscow State University  "Enhancing Na <sup>+</sup> Extraction Limit Through High Voltage Activation of the Nasicon-Type Na <sub>4</sub> MnV(PO <sub>4</sub> ) <sub>3</sub> Cathode Materials" <b>Maxim Zakharkin</b> Skoltech, Moscow / Moscow State University  "Rechargeable Lithium-Ion System Based on Lithium- Vanadium(III) Phosphate and Lithium Titanate" <b>Dr Arseny Ushakov</b> Saratov State University	<i>Hall Silayev, 3<sup>d</sup> floor</i>

	<p>"Influence of Crossover on the Columbic Efficiency of Vanadium Redox Flow Batteries"</p> <p><b>Mikhail Pugach</b> Skoltech, Moscow</p> <p><i>Chair: Evgeny Antipov</i></p>	
18:00	Transfer to the Hotel	
19:30	Transfer from the Hotel to Kazan Riviera	
20:00-22:00	Cultural Programme Bowling and Dinner	<b>by invitation</b> <i>Fatykha Amirkhana str. 16</i>
<b>September 12, Wednesday</b>		
08:20	Transfer from the Hotel to GRIAT	
09:00	<p><b>Lecture</b></p> <p>"Multi-electron Redox Electrode Materials for Li- and Na-Ion Batteries"</p> <p><b>Dr Nina Kosova</b> Institute of Solid State Chemistry and Mechanochemistry, Novosibirsk</p> <p><i>– Discussion –</i></p>	<i>Hall Silayev, 3<sup>d</sup> floor</i>
9:30	<p><b>Lecture</b></p> <p>"Organometallic Electrode Materials for New Generation of Batteries"</p> <p><b>Dr Oleg Levin</b> St. Petersburg State University</p> <p><i>– Discussion –</i></p>	<i>Hall Silayev, 3<sup>d</sup> floor</i>
10:00	Coffee Break	<i>Recreation area in the 3<sup>d</sup> floor</i>
10:30	<p><b>Lecture</b></p> <p>"Advanced Energy Storage: Challenges and Prospects"</p> <p><b>Professor Dr Keith Stevenson</b> Skoltech, Moscow</p> <p><i>– Discussion –</i></p>	<i>Hall Silayev, 3<sup>d</sup> floor</i>

11:00	<p><b>Short Lectures of Young Researchers</b> 20 min</p> <p>“In-situ Luminescence Analysis of Coordination Sensors (ILACS): Looking Inside Chemical Reactions” <b>Dr Huayna Terraschke</b> University of Kiel</p> <p>“Rare-Earth Ions as Local Probes in Hydrides and Mixed Anionic Hydrides” <b>Dr Nathalie Kunkel</b> Technical University of Munich</p> <p>“Sustainable hydrogen production <i>via</i> ammonia decomposition over bi-metallic iron catalysts: Room Promotional effect of gallium and cobalt” <b>Dr Klaus Friedel Ortega</b> University of Duisburg-Essen</p> <p><i>Chair. Wolfgang Bensch</i></p>	<i>Hall Silayev, 3<sup>d</sup> floor</i>
12:00	Lunch Break	<i>Cafeteria, 1<sup>st</sup> floor</i>
13:00	<p><b>Lecture</b></p> <p>“Fabrication of NiO/Ni Microfibers as Anode Material for Lithium-ion Batteries with Enhanced Capacity and Rate Capability” <b>Dr Mikhail Morozov</b> KNITU-KAI, Kazan</p> <p>– Discussion –</p>	<i>Hall Silayev, 3<sup>d</sup> floor</i>
13:30	<p><b>Short Lectures of Young Researchers</b> 20 min</p> <p>“Cell Design Aspects in lab scale electrocatalytic CO<sub>2</sub> reduction experiments” <b>Jonas Geisler</b> University of Jena</p> <p>“Influence of Temperature and Electrolyte Concentration on the OER Catalytic Activity of NiFe LDH” <b>Dr Corina Andronescu</b> Ruhr University of Bochum</p> <p>“Carbon Based Electrodes – A Black Prospect for a Bright Future” <b>Dr Saskia Heumann</b> Max Planck Institute for Chemical Energy Conversion</p>	<i>Hall Silayev, 3<sup>d</sup> floor</i>

	<p>"A Local View on Cu/ZnO/Al<sub>2</sub>O<sub>3</sub> Catalysts for Methanol Synthesis"  <b>Dr Thomas Lunkenbein</b>  Fritz Haber Institute of the Max Planck Society, Berlin</p> <p>"Sunlight Driven CO<sub>2</sub> Valorization via Photocatalysis and Heterogeneously Catalyzed Glycolic Acid Upgrading"  <b>Dr Michael Goepel</b>  University of Leipzig</p> <p>"Production and Use of Biogas as an Alternative Source of Energy"  <b>Dr Nikolay Makisha</b>  Moscow State University of Civil Engineering</p> <p><i>Chair: Malte Behrens</i></p>	
15:30	<p><b>Presentations of the Member Organisations of the DWIH</b> (Deutsches Wissenschafts- und Innovationshaus / German Centre for Research and Innovation)</p> <p>Dr Andreas Hoeschen, Director</p>	<i>Hall Silayev, 3<sup>rd</sup> floor</i>
16:00	<p><b>Science Café:</b>  Presentation of the Funding Programmes of German and Russian Funding and Research Organisations</p> <p>(Alexander von Humboldt Foundation, DAAD, DFG, Freie Universität Berlin, Helmholtz Association, Ministry of Culture and Science of the German State of North Rhine-Westphalia in Russia, Russian Science Foundation, Russian Foundation for Basic Research, Thuringia International in Russia)</p>	<i>Hall Silayev, 3<sup>rd</sup> floor</i>
17:00	<p><b>Short Lectures of Young Researchers</b>  20 min</p> <p>"Design of Catalysts for Carbon Dioxide Valorization under Mild Conditions"  <b>Ruslan Lukin</b>  Kazan Federal University</p> <p>"Evaluation of Anion Exchange Membranes for Low Cost Alkaline-based Water Electrolysis"  <b>Irina Pushkareva</b>  Moscow Power Engineering Institute (National Research University)</p>	<i>Hall Silayev, 3<sup>rd</sup> floor</i>



	<p>"Evaluation of the Ir-based Oxygen Evolution Catalysts for PEM Water Electrolyzers"</p> <p><b>Artem Pushkarev</b> Moscow Power Engineering Institute (National Research University)</p> <p><i>Chair: Keith Stevenson</i></p>	
18:00	Transfer to the Hotel	
19:30	<p><b>Evening Reception by the DWIH-Moscow (German Centre for Research and Innovation)</b></p>	<p><b>by invitation</b></p> <p>Hotel <b>Mariott Kazan, "The Terrace" Restaurant</b></p>
<p><b>September 13, Thursday</b></p>		
08:20	Transfer from the Hotel to GRIAT	
09:00	<p><b>Lecture</b></p> <p>"Electrochemical Noises of PEM Fuel Cells and Their Diagnostic Properties"</p> <p><b>Associate Professor Dr Evgenii Denisov</b> KNITU-KAI, Kazan</p> <p><i>– Discussion –</i></p>	<p><i>Hall Silayev, 3<sup>d</sup> floor</i></p>
09:30	<p><b>Science – Business – Innovation</b></p> <p>"Industries-University Cooperation – The Siemens' Approach"</p> <p><b>Dr Martin Gitsels</b> Russia Vice President, Siemens AG</p>	<p><i>Hall Silayev, 3<sup>d</sup> floor</i></p>
10:00	<p><b>Lecture</b></p> <p>"Novel Routes for Processing of Thermoelectric Materials"</p> <p><b>Professor Dr Franziska Scheffler</b> University of Magdeburg</p> <p><i>– Discussion –</i></p>	<p><i>Hall Silayev, 3<sup>d</sup> floor</i></p>
10:30	Coffee Break	<p><i>Recreation area in the 3<sup>d</sup> floor</i></p>

11:00	<p><b>Short Lectures of Young Researches</b> 20 min "Controlling Activity and Selectivity for CO<sub>2</sub> Methanation on Highly Active Ru/TiO<sub>2</sub> Catalysts" <b>Dr Ali Abdel-Mageed</b> University of Ulm</p> <p>"Micro-macro-porous Composite Materials for Sorptive Heat Storage and Cooling" <b>Dr Alexandra Lieb</b> University of Magdeburg</p> <p>"Determination of Water Adsorption Kinetics and Adsorption Enthalpies – Experimental Setup and Challenges" <b>Jacob Eggebrecht</b> University of Magdeburg</p> <p>"Ion Exchange in Zeolite 13X – Tuning of the Thermochemical Heat Storage Behavior" <b>Juliane Willkomm and Dr Alexandra Lieb</b> University of Magdeburg</p> <p>"Solar Chimney with Heat-Accumulator Layer" <b>Darya Abramkina</b> Moscow State University of Civil Engineering</p> <p><i>Chair: Franziska Scheffler</i></p>	<i>Hall Silayev, 3<sup>d</sup> floor</i>
12:40	Lunch Break	<i>Recreation area in the 3<sup>d</sup> floor</i>
13:30	<p><b>Lecture</b></p> <p>"Au/ZnO Catalysts for Methanol Synthesis in Chemical Energy Storage Concepts" <b>Professor Dr Jürgen Behm</b> University of Ulm</p> <p><i>– Discussion –</i></p>	<i>Hall Silayev, 3<sup>d</sup> floor</i>
14:00	<p><b>Lecture</b></p> <p>"Underground Petroleum Refining: New Technologies for Hydrocarbon Production" <b>Dr Mikhail Varfolomeev</b> Kazan Federal University</p> <p><i>– Discussion –</i></p>	<i>Hall Silayev, 3<sup>d</sup> floor</i>

14:30	Coffee Break	<i>Recreation area in the 3<sup>d</sup> floor</i>
15:00	<p><b>Short Lectures of Young Researchers</b> 20 min</p> <p>“Ionothermal Carbons for Energy-Related Applications” <b>Dr Tim-Patrick Fellingner</b> Technical University of Munich</p> <p>“Development of New Proton Conductive Membranes for PEM Fuel Cells” <b>Sergey Maksimenko</b> Irkutsk National Research Technical University</p> <p>“Transient Response of Electrochemical Power Sources as a Diagnostic Tool” <b>Timur Nikishin and Guzel Timergalina</b> KNITU-KAI, Kazan</p> <p><i>Chair: Mikhail Varfolomeev</i></p>	<i>Hall Silayev, 3<sup>d</sup> floor</i>
16:00	<b>Closing Remarks</b>	<i>Hall Silayev, 3<sup>d</sup> floor</i>
16:30	Transfer to the Hotel	
<b>September 14, Friday</b>		
15:00-17:00	Falling Walls Lab <i>(optional)</i>	<i>Kazan Federal University</i>
	Departure	