

# Invitation to the 1<sup>st</sup> LIKAT Seminar virtual

## Hydrogen Small but powerful

### 3. November 2020

- 09:30**      **Prof. Matthias Beller**  
Welcoming
- 09:45**      **Prof. Walter Leitner**  
Catalytic Transformations at the Interface of Chemistry and Energy:  
*Challenges and Opportunities for Power-To-X Technologies*
- 10:45**      **Jacob Schneidewind**  
Two-photon water splitting at a molecular ruthenium complex
- 11:10**      **Dr. Hanan Atia**  
Approaches to stabilize Ni containing catalysts for dry reforming of methane
- 11:35**      **End**

The link to the event will be provided in advance by e-mail, as well as on the inter-/intranet and via Twitter.

<https://uni-rostock-de.zoom.us/j/81783409653?pwd=SjJjcVQ5RTVqSUJ2Qk9lUWpjZGxsZz09>

## **Catalytic Transformations at the Interface of Chemistry and Energy: Challenges and Opportunities for Power-To-X Technologies**

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The industrial transformation of carbon-based raw materials into valuable products forms the basis of today's global economy and modern societies. With its products ranging from energy carriers through plastics and advanced materials to biologically active compounds, chemistry is essential to cope with the global challenges of our time. Moving towards a more sustainable future, there is an increasing need for "defossilization" of the raw material basis using non-fossil resources together with the deployment of carbon-free energy technologies.<sup>[1]</sup> Hydrogen plays a central role as molecular relay between electrons and chemical structures for such *Power-To-X* technologies.<sup>[2]</sup> The present contribution will discuss the opportunities and challenges of this approach highlighting in particular the role of fundamental science in catalysis to unlock the potential.<sup>[3]</sup>

[1] *Designing for a green chemistry future*, J. B. Zimmerman, P. T. Anastas, H. Erythropel, W. Leitner, *Science* **2020**, 367, 397-400.

[2] <https://www.kopernikus-projekte.de/projekte/p2x>

[3] Selected perspective and review articles from our laboratory: a) *Love at Second Sight for CO<sub>2</sub> and H<sub>2</sub> in Organic Synthesis*, J. Klankermayer, W. Leitner, *Science* **2015**, 350, 629-630; b) *Harnessing Renewable Energy with CO<sub>2</sub> for the Chemical Value Chain: Challenges and Opportunities for Catalysis*, J. Klankermayer, W. Leitner, *Phil. Trans. Royal Soc. A* **2016**, 374, 20150315; c) *Selective Catalytic Synthesis Using the Combination of Carbon Dioxide and Hydrogen: Catalytic Chess at the Interface of Energy and Chemistry*, J. Klankermayer, S. Wesselbaum, K. Beydoun, W. Leitner, *Angew. Chem. Int. Ed.* **2016**, 55, 7296-7343; d) *Sustainable Conversion of Carbon dioxide: An Integrated Review of Catalysis and Life Cycle Assessment*, W. Leitner, A. Bardow, et al. *Chem. Rev.* **2018**, 118, 434-504; e) *Transition Metal Complexes as Catalysts for Electroconversion of CO<sub>2</sub>: An Organometallic Perspective*, C. Werlé, N. Kinzel, W. Leitner, *Angew. Chem. Int. Ed.* **2020**, 59, in press.