

Platinum Group Metal-free Electrocatalysts: Small Molecules Activation and Conversion 01/21/2020 - 01/24/2020

This workshop will bring together a small, yet very energetic group of world-renown experts in electrocatalysis to discuss activation of small molecules of importance to energy technology: hydrogen oxidation and evolution reactions (HOR/HER), oxygen reduction or oxygen evolution reactions (ORR/OER), CO₂ electro-reduction (CO₂ER) and nitrogen reduction reaction (N₂RR). The focus of the program is on platinum group metal-free (PGM-free) catalysts or several types: metallic alloys and composites, oxide, carbide, nitride, phosphide and mixed ceramic nanostructure, 2D catalysts such as MXenes, chalcogenides, graphene, transition metal-nitrogen-carbon (M-N-C) catalysts and other materials with atomically dispersed metals.

Day 1: Tuesday, January 21

08:15	Plamen Atanassov	Introduction: Electrocatalysis in Context
08:30	Voja Stamenkovic	Surface-Structure-Strain-Shape Relations in Electrocatalysis
09:15	Sanjeev Mukerjee	Unified Theory of HOR/HER in Alkaline pH
10:00	Coffee Break	
10:15	Zhongwei Chen	Atomically Dispersed Catalysts for Electrocatalysis
11:00	Hongfei Jia	Dual Active Site Design for Overcoming the Scaling Limitations of ORR
11:45	Joint Lunch	
13:30	Corina Andronesco	Electrocatalysis in confined space
14:15	David Eisenberg	Electrocatalysts Hierarchical porosity: Does it exist? Is it necessary? Can it be designed?"
15:00	Coffee Break	
15:15	Alessandro Lavacchi	Electrochemical Growth of Electrocatalysts and Supports
16:00	Sri Narayan	Inexpensive, Robust and Efficient OER Electrodes based on Iron Substrates
16:45	First Day Adjourn	

Day 2: Wednesday, January 22

08:15	Paul Kenis	Status of CO ₂ RR Catalysis, Hurdles and Opportunities towards Practical Applications
09:00	Csaba Janáky	Electrochemical CO ₂ Conversion: from Novel Cell Components to System Design
09:45	Coffee Break	
10:00	Charles McCrory	Mechanistic Studies of Molecular Electrocatalysis of CO ₂ Reduction Reaction
10:45	Mukund Mukundan	Direct Electroreduction of Nitrogen to Ammonia: Approaches and Challenges
11:30	Karthish Manthiram	Lithium-mediated Ammonia Synthesis at Ambient Conditions
12:15	Second Day Adjourn	

We are planning on a joint dinner on Wednesday as 4 of us will have to leave on Thursday (but will participate the next day).

Day 3: Thursday January 23

08:15	Piotr Zelenay	PGM-free Electrocatalysis at Crossroads: How to Assure Much Needed Progress?
09:00	Vito Di Noto	PGM-free Electrocatalysis for ORR with Graphene Cores and Metal Carbon Nitride Shells
09:45	Coffee Break	
10:00	Lior Elbaz	Defining and Measuring the Site Density of PGM-free Catalysts
10:45	Ted Holby	Atomic Scale Modeling of Single Atom Electrocatalyst Stability
11:30	Jose Zagal	How Universal are the Reactivity Descriptors of MN ₄ Molecular Electrocatalysts
12:15	Third Day Adjourn	

We are planning on a joint dinner on Thursday as 6 of us will have to leave on Friday (but most of them after the adjourn).

Day 4: Friday January 24

08:15	Shoji Hall	Structural Transformations of Metal Alloys Under Electrocatalytic Conditions
09:00	Jacob Spendlow	Intermetallic PtCo ORR Catalysts for Enhanced Durability
09:45	Coffee Break	
10:00	Fabio Di Fonzo	Out-of-equilibrium Synthesis of High Entropy Nanostructured Electrocatalysts
10:45	Marc Secanell	Electrochemical Impedance Spectroscopy of PEM Fuel Cells and Electrolyzers
11:30	Karl Mayrhofer	Online Time-resolved Product Characterization for Electrocatalytic Reactions
12:15	Last Day Adjourn	