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2018

ELCOREL NEWS

ELECTROCHEMICAL CONVERSION OF RENEWABLE ELECTRICITY INTO FUELS AND CHEMICALS

*A Marie Skłodowska Curie Innovative Training Network (ITN) - **ELCoREL** – is supported by the European Commission to train the new generation of experts capable to develop and implement novel technologies capable of storage of renewable electricity into fuels and chemicals.*

ELCoREL aims at both scientific and technological aspects of the storage of renewable electricity in fuels and chemicals. To meet this goal the ELCOREL consortium relies on work of 14 Early Stage Researcher (ESR) who carry out research aiming at development of systematic knowledge supporting development of novel tailored catalysts meeting specific activity and selectivity targets for oxygen evolution and CO₂ reduction. The involvement of two industrial partners ensures rapid application of the fundamental science in electrochemical technology.



ELCOREL consortium met at BAUTAHØJ in September 2018...



the second ELCOREL meeting took place in Bautahøj, Denmark between September 24th to 28th. Bautahøj is a scenic spot with a beautiful view on one of the Danish fjords (another thing learned: yes, there are fjords in Denmark and yes, there is more than one). The first three days were devoted the ELCOREL's Summer School on Computational Chemistry. The training activities were as usual open to the participants from outside of ELCOREL consortium. The school focused mainly on simulations, Density Functional Theory and machine learning, with some strategically placed lectures on more general topics that helped elevate some tension experience by the experimentalist who had very little previous contact with computational chemistry.

The third day, after the end of the workshop, a short tour to the nearby Jægerspris Castle was organized, to learn a little more about the more colorful parts of Danish history.

The last two days were dedicated to the regular ELCOREL meeting during which all of the ESRs presented their projects. It was nice to catch up on everyone else both on a personal and scientific level and to see growth and progress from every side.

In the end, it's easy to see that ELCOREL is slowly and consistently fulfilling its purpose: spending time together both in the lecture room and over a game of pool and a beer creates bonds and a network of people that know each other and are willing to work together on different levels towards a common goal. Next stop, Prague!

Text by Davide Pavesi (Avantium Chemicals), photo by Michala Yun-Joo S Schlichtkrull (Copenhagen University)



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WE INTRODUCE...

Riccardo Marina

Riccardo is a Junior Researcher at Industrie De Nora, Milan. He received his BSc at Politecnico di Milano in 2014 and pursued his studies with a double master degree at Grenoble Institute National Polytechnique, France and Ecole Polytechnique de Louvain la Neuve, Belgium with a master thesis in development of glucose monitoring devices at Fraunhofer IAP, Potsdam (Germany). After an experience as R&D Engineer in Paris in the field of medical devices, currently his research activities at De Nora focus on electrodes and catalysts development for efficient hydrogen production as energy storage medium.

Riccardo, would you like to tell something about studies and your Master Thesis?

I earned my bachelor degree in Materials and Nanotechnologies Engineering at "Politecnico di Milano" with a bachelor thesis about the mechanical and physical-chemical properties of 3D printed polymers for domestic use. I was then selected for a multinational master called FAME (Functionalized Advanced Materials and Engineering), funded by Erasmus Mundus and developed between France and Belgium, always in a very stimulating environment. I was welcome in Potsdam, Germany for my master thesis where I learnt about biomaterials, medical devices and biochemistry: knowledge that was very useful during my first job experience in Paris, where I worked as R&D engineer for the development of a leadless pacemaker and a glucose monitoring device.

What are you working on right now?

My research at De Nora is focused on the development of electrodes for the anodic reaction of water electrolysis: oxygen evolution reaction (OER). The final goal is to create a catalytic coating that enhances the activity of the substrate and reduces the oxygen overvoltage (OOV) of the electrode. At the industrial level, the reduction of the OOV results in a lower cell voltage, meaning huge savings of energy required for an electrolyser to run at high current density. The achievement of this goal could lead to efficient energy storage, finally increasing the renewable resource supply and making the hydrogen economy blossom. The strategy I identified to reach the goal is to produce a high surface area Nickel-based coating and to characterize its structure, its morphology and its electrochemical performance.

What is your experience from attending the conference in Bologna and / or the actual secondment at the Heyrovsky Institute in Prague?

Attending the Annual Meeting of the International Society of Electrochemistry was very useful experience – the more since it was in Italy. I could attend talks given by the top experts in the world, listen to a Nobel prize winner (Steven Chu) lecture and get in contact with a lot of electrochemists from the whole world.

During the time spent at the Heyrovsky Institute in Prague I could learn new techniques like freeze drying and new electrochemical protocols. Moreover, the supervision of Prof. Krtil and the continuous exchange of information within the group helped me to understand more electrochemistry. In parallel of my practical research, I had the possibility to study and follow a very interesting course about Electrochemical Engineering.



How do you like the life in Prague?

Prague is a beautiful city especially during Christmas time; every corner has something magic and living there I had the time to discover many of them. The good beer helped to avoid the cold!

How is life far from home / family?

I spent many years far from home, I am used to distance. Though, my coming back is always a good reason for a family party.

What are your hobbies and interests?

I spend my free time doing sport and travelling.

What is your favorite color?

Green.

What is your favorite meal?

Pasta alle vongole (Pasta with clams).

What is your favorite drink?

Definitely coffee!

What is your favorite city / destination / country?

I love France and Sicily

Anything else you would like to tell us?

See you in Liblice!

Thank you and good luck!

(ks)

...memories of Bologna ISE meeting

Being a student helper on the 69th Annual ISE meeting was a great opportunity for me as I was able to help in facilitating and in helping the organizers of the event. More than 2000 delegates participated on the said meeting, where 20 different symposia were conducted as well as various general sessions. I was assigned to help in the symposium about electrochemical systems for energy conversion. Here I was able to listen to different talks from different expert electrochemists all over the world. Over all, it was a different kind of experience as I was able to learn more about the field of electrochemistry and at the same time know more people on the same field.

DJ Donn Matienzo



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Join us for the next workshop! ...open for public!



ELCOREL

Liblice
Castle hotel



"Surface Electrochemistry and Spectroscopy" workshop in Liblice (near Prague) 28–30 January 2019

SPEAKERS: Robert Schlögl, Sarah Horswell, Zenonas Jusys,
Andrea Russell, Petr Krtil, Anita Fors

WORKSHOP PACKAGE – REGISTRATION FEE

Sunday-night, Monday, Tuesday, Wednesday

Prices including hotel reservation (3 nights, from Sunday evening until Wednesday after lunch)

2 ½ days, 3 x lunch, 2 x dinner, stay at the Chateau Liblice, single room € 395,- per person

2 ½ days, 3 x lunch, 2 x dinner, stay at the Chateau Liblice in shared room € 355,- per person

Venue: <http://www.chateau-liblice.com/>

REGISTRATION on-line till 12 January 2019 > <http://elcorel.org/events.php>



PROGRAM

VENUE

<http://www.chateau-liblice.com/>

Monday 28th January

09.00 – 11.00

Sarah Horswell

In-situ investigations of electrode-electrolyte interface in infra-red region

11.15 – 12.15

Andrea Russell

Surface enhanced spectroscopies in electrochemistry I

13.30 – 14.30

Andrea Russell

Surface enhanced spectroscopies in electrochemistry II

14.45 – 16.45

Robert Schlögl

Photoelectron spectroscopy and surface electrochemistry

17.30 – 18.30

Concert

Tuesday 29th January

09.00 – 11.00

Zenonas Jusys

Mass spectroscopic detection of reaction products in electrocatalysis

11.15 – 12.15

Anita Fors

Scientists' guide in the communication world I

13.30 – 14.30

Anita Fors

Scientists' guide in the communication world II

14.45 – 16.45

Petr Krtil

Shared research facilities and how to use them

Wednesday 30th January

09.00 – 10.00

Petr Krtil

X-ray absorption spectroscopy in rational catalyst design

10.30 – 11.30

Petr Krtil

X-ray absorption spectroscopy in rational catalyst design II

...FURTHER TRAINING EVENTS

- Workshop on Surface Electrochemistry and Spectroscopy (Heyrovsky Institute of Physical Chemistry)
- High Performance Computing (Institute of Chemical Research of Catalonia - ICIQ)
- Material Aspects of Contemporary (Electro-) Catalysis (DeNora Industries)
- Summer School on Electrochemical Engineering and Catalysis-related Energy Applications (Aalto University)
- Industrial (Electro-) Catalysis (Avantium Chemicals)



...the memory
of Denmark



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