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A journey into mCBEEs training, the European training network on corrosion problems at micro and nanoscale

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Last week of June was the time for the third training event of the mCBEEs network: 18 PhD students met in Ljubljana at the Josef Stefan Institute to attend the school on fundamental of corrosion protection and coatings production. Seven teachers from across Europe and belonging to the same network met for one week to introduce the students to theory and practice of coatings for corrosion protection.

mCBEEs is an acronym for: Advanced integrative solutions to Corrosion problems beyond micro-scale: towards long-term durability of miniaturized Biomedical, Electronic and Energy systems. It is a 4-year doctoral student training network funded by the H2020 program under the Marie Marie Skłodowska-Curie Action scheme. 18 partners cooperate in the network and 15 different interconnected research projects are running to face research questions regarding corrosion and protection at the micro scales in applications related to electronics, energy and biomedical industries. The network includes research and training for early stage researchers and has the ambition to synergically work on the front line research questions in the field of corrosion and provide solutions for these problems. The network has also the goal to train the new generation of researchers in the corrosion field and prepare them to push the knowledge boundary beyond the state of the art. The training event was therefore designed in order to revise the new scientific knowledge, but also train soft skills important in the work of a future researcher.

This training school marks the midterm for the network and is a good opportunity for an assessment point. The students were recruited about 1 year ago and now they have all started to have a good grip on their research project. During the school they had the chance to present their initial results and discuss them with peers and teachers. The students are also required to spend secondment periods abroad during their studies and this event was a great opportunity to discuss what a secondment offers: not only access to new equipment and knowledge, but also a new culture and a new research environment and access to expert feedback on the own work. It is a great learning experience especially about new ways of working and new cultures.

Having such a panel of experts and fellows, and having the opportunity to meet every 6 months discussing the ongoing research is a privilege, for which the mCBEEs students show great appreciation: every single break during the training event was spent discussing their research, asking questions and giving feedback on the work and looking for tricks to improve the experimental set-up.

The training school covered theoretical lectures, practical lab session, research presentation and discussion. The students had both an individual task to peer review the work presented by one of their peers as well as a group task related to the lab experiments. The teaching week covered several coatings technologies: the lecturers presented theory and study cases related to organic coatings, electroplating from aqueous solution and ionic liquids, composite coatings, thin films produce by vacuum technologies, Atomic layer deposition, sol-gel coatings. Several of these coatings were then available and provided as specimens for the lab testing. The students were divided in groups and had the task to evaluate the quality and corrosion protection of the coating systems. The groups were then mixed and the results have been assessed and discussed comparing different coating. Particular attention was requested in discussing and highlighting the application of the same technique to evaluate different coating systems, considering limitations and how each test parameter needs to be adjusted.

The main goals of this experience were to highlight and discuss with the students the good practice in the lab while performing coating testing, as well as to discuss sources of artefacts introduced by the experimental approach.

The purpose of such assignment is not only to report and discuss scientific results, but also to train soft skills as, working in a group, co-writing in a collaborative group working in different labs and having a different background as well as considering the ethical aspect of authorship. Before presenting the task, the training

manager gave a review of authorship guidelines (Vancouver recommendation, <http://www.icmje.org/icmje-recommendations.pdf>) discussing the ethical implication of being an author.

To learn more about the research project running under the mCBEEs network, please visit www.mcbees.eu

PhD students attending the training events in Ljubljana, 24-29 June 2019

Lectures during the mCBEEs training event in Ljubljana, 24-29 June 2019

One of mCBEEs student presenting his work

Group working during the mCBEEs training event

Lab session during the mCBEEs training event

The training event organizers,

From left: prof I Milosev, B. Malic, D. Zimerl, Josef Stefan Institute, prof C. Zanella, mCBEEs training manager,
Dr M. Lekka, mCBEEs coordinator