Name of the MSC Fellow: Cina Foroutan-Nejad
Nationality: Iranian
Host organization: CEITEC-Masaryk University
Country of the Host: Czech Republic
Project Acronym: GrapheneReceptor
Project start and end date: 01 Nov 2014 – 31 Dec 2017
Type of MSC action, H2020: MSCA COFUND FP - SoMoPro

Your story:

Project objectives and research field:

The goal of my project was to study the role of external electric fields on weak intermolecular interactions. My main hypothesis was that this may lead to a new method for removing heavy ions from drinking water as well as desalination of water. As a side project within the context of my project I was interested in studying the effect of external fields on the molecular structures having in mind that this effect can be used for designing all-electronic molecular switches.

Tell us why your topic is important and/or how it brings to advancement in your research field:

The application of external electric fields (EEF) in chemistry was introduced in 2009 but soon was forgotten. I found this topic potentially interesting and started my research on this topic, back in 2012. In 2016, the first experimental evidence of the effect of EEF on chemical processes was reported in Nature, 2016, 531, 88-91. After this discovery the field is experiencing rapid growth because experimental chemists are trying to explore the effect of EEF as a catalyst. My current research is on the topic of using EEF for molecular switches. Because of my work during SoMoPro project, recently I was invited by the Royal Society of Chemistry to write a book in collaboration with few other experts on the topic of EEF.

What are the benefits of participating in a MSC action?

My research topic is a totally new one that has a substantial unexplored potential. Yet, EEF can be used as a smart catalyst for preparation of pure chemicals without

using expensive conventional catalysts that are mainly prepared based on noble metals. This can reduce the cost of production of medications. Besides, I am focused on miniaturization of memories. This task will not only improve the storage capacity of memories (expected increase in capacity is up to 10,000 times) but also will reduce the energy that is required for data storage and transfer between the storage device (memory) and the processing device (CPU). This, in turn, will decrease the economic and ecological costs that are associated with the topic of energy.

Did you encounter any challenges during application/ implementation and did you get any help?

My major problem was starting the project. I had another running project that was practically finished but I had some difficulty convincing the rector of the University to let me wrap up the other project by writing the final report and begin SoMoPro.

Why did you choose a widening country as a Host? What was the reason that convinced you? What is making you professionally happy here?

My current host provides me with full support in applying for grants which is a major issue in research. Besides, I feel very comfortable in Czech society.

Would you recommend others to apply? What useful advice/ tips can you give them?

I already have! Dr. Zarabadi-Poor, SoMoPro fellow in the third period of the project, applied for this fellowship based on my recommendation.