

Field Report

Marshallplan Scholarship Program (MPS)

Peter Illich BSc

Home Institute: University of Applied Sciences (UAS) Vienna

*Host Institute: National Institute of Standards and Technology (NIST) – U.S.
Department of Commerce, Gaithersburg, MD 20899*

The stay in the USA and the time as a guest researcher at the National Institute of Standards and Technology (NIST) in Gaithersburg, Maryland, started with 02/13/2017 and ended with 06/05/2017. During that time I had the chance to be an active and integrated part of the Engineering Laboratory Division and work in the Heat Transfer and Alternative Energy Systems Group at NIST together with a team of experts in the field of photovoltaics (PV) and PV performance modelling and monitoring. The project I worked on shows remarkable outcome and results for my master thesis as well as a potential journal paper and deals with the evaluation of modelling algorithms through monitoring data measured at NIST. It has the title:

“Evaluation of photovoltaic modeling algorithms for various weather conditions based on granular intra-array module and weather measurements taken at NIST – Validation of IEC 61853-3 committee draft sub-models and spatial PV array analysis”

The following chapters sum up my experience abroad and my time at the host institution in the USA, funded by the Austrian Marshallplan Scholarship Program.

General Impression of Research Stay Abroad

I had never been in the USA before, so prior to my arrival there I was very curious about what would await me, how would I manage possible cultural differences, what would it be like at NIST, etc. Still, my expectations were kind of unprejudiced and I was looking forward to a new experience and challenge for my career. Nevertheless, recent happenings especially around the area I was going to live in had made me feel somewhat anxious.

Now, I am looking back at an amazing time filled with great memories in the USA. I had the chance to get to know many interesting and kind people from all around the world – some of who I know that I will meet them again in the near future either professionally or personally. Besides this, I could broaden my professional experience at NIST in the field of photovoltaics, which will definitely be beneficial for my future career steps.

Quality of Host Institution

The National Institute of Standards and Technology (NIST) in Gaithersburg-MD, as a governmental institution of the USA, has about 6000 employees, including externals such as guest researchers, interns or students. NIST, as a well-known institution worldwide, promotes the development and improvement of measurement science, standards and technology in a wide range of disciplines. NIST is known to be one of the best employers in the USA, providing novel research equipment and environment for specialists coming from all around the world. The high quality of research and development done in the competence fields at NIST especially can be proven through several Nobel Prizes shared by NIST researchers.

During my stay at NIST I was surrounded by experts who, in case I had doubts or needed guidance with my project, always were ready to help me or provide me with useful insights. Furthermore, NIST provided me with the necessary equipment for my work. Besides my project related work, I also had the

chance to see a lot of the work done at NIST's laboratories and I was able to join some workshops and interesting project meetings in which I could actively participate and share my professional knowledge.

All in all, NIST provides a high quality working environment in which I felt very comfortable and full of motivation regarding my project.

Contacts within the Host Institution, Inclusion in the Organization

During my time at NIST I worked closely together with my two supervisors Brian Dougherty and Matthew Boyd – both part of the Heat Transfer and Alternative Energy Systems Group in the Engineering Laboratory at NIST. We scheduled at least one meeting for every week in which I was able to present the developments of my project and elaborate together with them in discussions the goals and scientific approach of my work.

Besides my project related work I was also included in several other projects at NIST. One of them in collaboration with Andrew Fairbrother, who focusses on the degradation and aging behavior of polymer materials included in field deployed PV modules. Together we discussed the impact of encapsulation material degradation effects on the performance of the observed field deployed PV modules.

In a project related to the low light sensitivity and indoor application possibilities of PV technologies, I got in touch with Behrang Hamadani, researcher at NIST. We managed to establish a collaboration within this project between an Austrian company (and former employer of mine) and NIST.

Recommendations for Future Marshall Plan Students and Fellows

I highly recommend to precisely prepare project related aspects such as the project goals, scientific questions and the methodological approach of the project before the start of the time as a Marshallplan student at an institution abroad. This allows you to save time in the first weeks abroad and enables you to get started with your project immediately upon arriving at the host institution.

Besides the work related aspects, I recommend to enjoy the new experience of living abroad and try to get to know as many new places or cultural activities as possible. Living in a shared apartment with other guest researchers from all around the world was a great experience for me as well and helped me to get to know many people.