Stefan Mitterhofer

LPVO, University of Ljubljana, Slovenia

I studied physics in Vienna. There I discovered my passion for photovoltaics (PV) – not just the technology itself, but also its application as a possible solution to various issues humanity is facing, including climate change and electrification of poorer and more remote areas of the world with lacking infrastructure. Even though it has already reached a mature state and is an established technology in the market, there is much more research to be done concerning the long-term reliability and lifetime analysis of PV modules and systems. Within Solar-Train, we are trying to fill this gap.

However, the technology is constantly evolving. New modules and materials are entering the market. They can behave differently in the field than modules installed just a few years ago. Thus, we have to test these materials indoors in accelerated tests, and connect these results with different climates in the field. My research focuses on one important aspect of this: Moisture transport in the polymeric materials used as encapsulants and backsheets of PV modules.

Outdoor monitoring setup of moisture ingress installed in Rome

During my work, we developed a new model for moisture transport in PV encapsulants. It enables a more accurate prediction of the moisture content in PV modules. Furthermore, the ingress in PV mini-modules in various climates within and without Europe is measured in field experiments, as well as in a climatic chamber. The results allow for a better comparison between the behaviour of modules mounted in these climates as well as a connection to accelerated indoor tests.

This has not always been easy. Research can be frustrating. Sometimes, you work for months on an idea, only to realize in the end that it does not lead anywhere. However, it is all the more rewarding when the results are good and lead to a better understanding about the physics of a process, and hopefully contribute to a more sustainable technology in the future.

My Solar-Train story

The SolarTrain project allowed me not only to follow my passion for science. It enabled me to work in different countries and attend conferences and workshops all over Europe. It enabled me to build a professional as well as a personal network with other likeminded researchers in the field within and without the project framework. Thus, I am confident that I will be able to further work as a researcher after the project.

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University of Ljubljana Faculty of Electrical Engineering

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