

INTERNATIONAL EXCELLENCE FELLOWSHIPS

Experience Report 2022

Name and title of fellow	Dr. Martina Gamba
Duration and time of research stay	Three months
Host professor and host institute at KIT	Günter Schell and Claudia Bucharsky. Institute for Applied Materials

Testimonial

My research field is
Ceramic materials for all-solid-state lithium batteries.
How is my research field going to affect the world of science?
My field of research constitutes an area of interest at the world of sciences because global warming, as well as the depletion of fossil fuels, have led countries to commit to replacing fossil fuel-powered transport with electricity-powered ones in the coming years. This demand the development of electrochemical devices with enhanced properties. Current lithium ion batteries (LIBs) do not fulfill all the requirements to advance electromobility (EV) development. Short driving range achievable with a single charge, long charging times and their risk of explosion are the main issues that must be overcome. In that sense, a strategy constitutes to replace the liquid organic electrolyte (LE) with solid electrolytes (SE) to produce All-Solid-State Batteries (ASSBs). In addition to being nonflammable, SEs have several advantages over conventional LEs. For example, they offer the possibility to increase the energy density by directly adopting lithium metal as an anode. However, considerable time and effort are still required before ASSBs are well spread in the market, and my research is a contribution in this area.
My main finding / highlight during my research work at KIT was
The highlight of this three months investigation was that we satisfactorily synthesized the electrolyte and electrodes active materials, the first step in building an all-solid-state battery. Furthermore, this experience allowed the possibility to enhance the collaboration between our groups and to continue working together until the goals of the complete project are fulfilled.

I have chosen the Karlsruhe Institute of Technology because

The trajectory of the host group in the field of research is very important and complements very well with my research topic in Argentina. In addition, KIT is a prestigious university at an international level, so the possibility of having an experience here enriches my professional development and represents a growth for my entire work group in Argentina.

If you want to, you can give advice to the next fellows. What should they know about Karlsruhe, KIT and the International Excellence Fellowships program?

Karlsruhe is a city that allows you to have diverse experiences, very comfortable to ride a bike, with a large forest in the city and close to the Black Forest if you like outdoor activities. If you are interested in cultural experiences, it is also very rich.

KIT is a university with a great record of accomplishment and possibilities to grow scientifically. The people who coordinate the International Excellence Fellowships are very valuable and hospitable. They will help you to make your stay unforgettable, organizing both scientific and informal activities where is possible to meet new and valuable people. They make you feel welcome from day one.