ALEXANDER VON HUMBOLDT FOUNDATION

Dr Felix Lüpke, young investigator group leader at the Peter Grünberg Institute: Quantum Nanoscience (PGI-3) at Forschungszentrum Jülich, reports on his research stay in the USA as a Feodor Lynen Fellow of the Humboldt Foundation.

"WHERE MANY GOOD PEOPLE COME TOGETHER, THERE IS A MOMENTUM OF ITS OWN!"

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How did you come up with the idea of applying for this scholarship and going to the USA?

Dr Felix Lüpke: I applied for the research fellowship towards the end of my doctoral studies, when I was looking for a follow-up position. The prerequisite for a Feodor Lynen Fellowship is to find a host at a partner institution. So I got in touch with a fellow researcher at the Oak Ridge National Laboratory in Tennessee, whom I already knew from the work for my doctorate. We then jointly submitted a research project to the Humboldt Foundation, on a topic that was related to my doctoral thesis. However, as it takes up to a year for a decision to be made on such an application and I didn't want to wait that long, I applied for a postdoctoral position at Carnegie Mellon University in Pittsburgh, Pennsylvania, with the help of my doctoral supervisor Prof. Bert Voigtländer, which I then took up first. There, I was able to conduct successful research under the guidance of my postdoctoral supervisors Prof. Randall Feenstra and Prof. Benjamin Hunt. Six months later, I was then also accepted for the Feodor Lynen Fellowship. Fortunately, there is an option to postpone the start of the fellowship by one year, so I did that. Then, after a year and a half in Pittsburgh, I moved to Oak Ridge.

How did your supervisors at Carnegie Mellon University feel about your wish to change?

Dr Felix Lüpke: They would have liked to keep me there longer, but they understood my motives. The decisive factor in my decision to change was that in Oak Ridge, compared to Pittsburgh and Jülich, I was able to work on novel types of experiments. As such, it was an opportunity to further expand my scientific profile. This strategic expansion of my own skills proved to be essential later. Generally speaking, my research is about solid-state physics problems; we analyse surfaces. In particular, we focus on thin films and layers that are only a few atoms thick, such as graphene. We then use a scanning tunnelling microscope to study quantum states in these samples that are two-dimensional or even one-dimensional in nature. At Carnegie Mellon University, we worked on layer stacks made by manually combining different existing two-dimensional materials, while in Oak Ridge we investigated new types of layered materials.

When did you start your second postdoc at Oakridge?

Dr Felix Lüpke: In October 2019. Unfortunately, due to the COVID pandemic, I wasn‘t allowed to go back to the lab in March 2020 and had to work from home for about six months. As an experimental physicist, this was an enormous restriction for me. During this time, I went hiking a lot and started playing golf because it was practically the only sport that I was still allowed: outside and with sufficient distance from others. Through golf, I met new people with whom I‘m still in contact today. Later, I was at least able to go back to the lab for a week or two at a time.

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Felix Lüpke on a hike in the Great Smoky Mountains National Park in Tennessee, USA

How long did you stay in the USA after that?

Dr Felix Lüpke: Until Fall 2020. As it was not foreseeable how the situation in the lab would develop further, I applied for a position in Jülich. I kept in touch with my old working group during my postdocs. With the support of our institute director Prof. Frank Tautz, we then wrote an application for a priority programme of the German Research Foundation (DFG). After this was approved, I left my postdoc in Oak Ridge after about one year and moved to Forschungszentrum Jülich. Here, I am now a young investigator group leader and have since been able to build my own research group.

Would you recommend the Feodor Lynen Scholarship to others?

Dr Felix Lüpke: Definitely. The application process is quite straightforward, all you need is a few pages and a letter from your host. For this, I consulted Prof An-Ping Li, who became my host in Oak Ridge, which worked very well. My experience is that potential hosts are happy to support good scientists and projects in the application process, because they also benefit from it in the end, when the proposal is granted. The support from the Humboldt Foundation was also excellent; they always helped me straight away when I contacted them with questions. All in all, the stay was a real benefit, both on an academic and personal level.

How does the funding work?

Dr Felix Lüpke: The scholarship holders receive a lump sum for the duration of the scholarship (up to two years for the Feodor Lynen Scholarship) that depends on various factors such as country or family situation. The host organisation pays around a third of this amount. I received a total of around 3,000 dollars per month, of which I received 1,000 dollars directly on-site – either as a cheque or bank transfer to my US account – and the rest from the Humboldt Foundation to my German bank account. I was able to support myself well with that amount. The city of Oak Ridge is rather small, so I found a nice flat for about 1,000 dollars a month. By comparison, a similar flat in Los Angeles would have cost at least three times as much. As there is hardly any public transport in Tennessee, I bought a second-hand car for around 4,000 dollars, which I sold again before I left. I was able to use it for travelling, too. Driving in the USA is very relaxed as it is generally less aggressive compared to Germany.

Were there any differences in the research culture?

Dr Felix Lüpke: There was somewhat less administrative work in the US, which makes it possible to focus more on the work in the lab. Overall, my impression was that people worked more intensively, and I myself was more eager to work, too. Where many good people come together, there is a momentum of its own; they push each other. You also have fewer friends and distractions abroad so that you are more focussed on the work. In my experience, the research capacity generally is at its highest in the first postdoc. There, you can fully apply the knowledge that you acquired as a doctoral student. In subsequent postdocs you are typically already expected to take on more responsibility (e.g. student supervision, laboratory management), especially if you are aiming for an academic career. The amount of administrative work increases.

What advice would you give to someone who, like you, is starting their first postdoc in the USA?

Dr. Felix Lüpke: I would say that it's definitely worth it, regardless of whether you will stay in academia or not. It's a great experience to come into contact with a different culture and working atmosphere and seeing new places. The most important thing is to apply in time, at least one year before the end of your doctorate. The basis for my Feodor Lynen Fellowship were the contacts that I made during my time as a doctoral student, so you should attend conferences, give talks, present posters and generally not be afraid to talk to professors and group leaders who are doing research in similar fields to make connections.

To what extent did your own research benefit from your stay?

Dr Felix Lüpke: I learnt many different things during my postdoc and was able to strengthen my scientific profile. In Pittsburgh and Oak Ridge, I particularly learnt new experimental techniques for producing and characterising samples. We have now implemented these techniques here at Jülich and developed them further to be even more flexible in sample fabrication; for example, we can now combine even more materials in layer stacks and make them even cleaner. As such, my young investigator group is largely based directly on the research I did in my two postdocs. Since recently, my research is also funded through the Emmy Noether Programme of the DFG.

The interview was conducted by Kristin Mosch.