Steuben-Schurz-Gesellschaft – USA Interns

Internship at the Karlsruhe Institute of Technology (KIT)

Eye-opening experience at the Institute for Neutron Physics and Reactor Technology

Sam Sanders

Sam Sanders*, from Bullhead City, Arizona, is a rising sophomore at the University of Pennsylvania in Philadelphia. He expects to declare Physics and German as his majors this coming year, and was particularly excited to have the opportunity to explore a branch of physics research while being immersed in German. He found his internship opportunity with assistance from the* Steuben-Schurz Society.

Some people at my university, and even occasionally in Germany, are surprised by my choice of majors: I study both German and physics. While seemingly a challenge, beginning to combine these two interests was not as difficult as I might have expected. Much to my delight and surprise, my German professor recommended that I submit an application **to *the Steuben-Schurz Society***. Within a few months, I had been placed at ***the Karlsruhe Institute of Technology's Institute for Neutron Physics and Reactor Technology*** to digitally model and test sections of nuclear reactor cores.

In my tentative physics major at *Penn*, I had been considering a concentration in computation. While on the job at KIT, I was able to gain valuable experience in this area. For example, I interacted with our Linux server cluster that handles calculations solely through a command-line terminal and plain-text inputs. Over the two months, I came to be more familiar with Linux commands and Serpent, the code used to simulate neutron transport. On a typical day at the Institute, I spent my time creating Serpent input files that reflect the properties of the different nuclear reactors assigned to me. Once finished, I would run a simulation, and would then check the output values to see if they were reasonable. These valuable skills concerning physics in computational settings give me insight into possible future career options.

I have also had the opportunity to tour the on-campus nuclear waste processing facility, which further opened my eyes to the world of nuclear energy. I hadn't given much thought to the waste that nuclear plants generate (outside of the general concern we share in the US), but this is no longer the case. It was very plain to see how painstakingly slow and precise the process of nuclear decontamination must be. I now have an idea of the extremely long time-scale in which nuclear waste processing occurs, a thought that lends perspective when considering a future of electricity generation that may involve nuclear fission.

With friends in front of Frankfurt skyline

…and trips "helping to give a sense of European culture"

Outside of the workplace, I had a number of opportunities to travel. On the weekends, I was able to travel to cities in southwest Germany, allowing me more opportunities to speak German and see some old friends. I was even able to make a few trips outside of the country, helping to give me a sense of European culture as a whole. Between Germany, France, Belgium, and Switzerland, I have been able to expand my horizons, interact with new cultures, and see the world in a more international light.

This was my first time in Germany, but if my time here has shown me anything, it is that it will not be my last. My internship wove together a wonderfully accessible country and continent, a beautiful language, and a challenging scientific inquiry to create an eye-opening experience that I am eager to continue in future years. As I work towards finding a path in physics and attaining fluency in German, I know that I'll be able to craft a future that combines both of my goals into something spectacular.

Redaktion: J. Adameit / G. Schanno
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