



## Silicon Carbide Oxidation and Life in a German Wohngemeinschaft From Minnesota to Karlsruhe

Dan Mueller

**Dan Mueller** tells us that he applied early in his junior year with the help of *Adam Pagel* at the *University of Minnesota's Study Abroad Office* and *Juliane Adameit*, coordinator of the *USA Interns program*. In addition, the German department at the University of Minnesota was greatly helpful in preparing him for his experience abroad. With five semesters of German “under his belt”, he flew to Germany just after the end of spring finals.

My internship was with a research group at the *Karlsruhe Institute of Technology (KIT)* who were performing research on new types of nuclear cladding aimed at replacing the currently used *Zircaloy cladding*, which has performed poorly under *Loss-of-Coolant Accidents (LOCAs)* such as the accident at the *Fukushima-Daichii* nuclear power plant. My internship was specifically aimed at researching the oxidation of silicon carbide in LOCA conditions: temperatures from 1600 to 1800 °C (2900 to 3300 °F) in a steam environment. In addition, I helped with a small project testing the addition of a layer of alumina to Zircaloy in an attempt to prevent oxygen diffusion.



The average day of work consisted of me performing an experiment or preparing samples for electron microscope measurements in the morning, and then recording results, preparing new samples, and reading scientific papers to increase my knowledge of the subject in the afternoon. Near the end of the internship, most of the experiments were complete, and the emphasis changed to summarizing my findings in a research paper.

For the three month duration of my internship, I stayed in a *Wohngemeinschaft in Karlsruhe* with three native Germans. One of my first nights there, the local brewery, *Hoepfner*, had a festival which just happened to coincide with my birthday. I went with one of my roommates and several of his friends and enjoyed a night partying to German music and drinking greater beer. It is one of the most memorable experiences I've had in my entire life.



During a few of the weekends during my stay, I visited various towns in the vicinity of *Karlsruhe: Heidelberg, Freiburg, and Frankfurt* among them. For the latter two trips, I went with other USA interns from Karlsruhe. The scenery in these cities was absolutely gorgeous! In *Freiburg*, the *Altstadt* area of the town is filled with beautiful construction, and we were able to climb up onto a large foothill in the neighborhood and see a beautiful landscape for miles around.

In addition, I travelled to Copenhagen, Denmark one weekend to meet friends who I had spoken to for a long time online but had never met before in real life. We went to an amusement park called *Bonbonland*, famed for its quirky mascots and the candy produced there. I unfortunately did not know any Danish, but learned there the meaning of the word “hygge” (pronounced hoo-geh), which translates poorly to English as the word “coziness”; it has connotations of spending times with friends and good drinks. The feeling one gets around Christmas-time when with good friends and family can be

**-2- Dan Mueller: From Minneapolis zu Karlsruhe**

described well as *hygge*. Though I had to leave Denmark as quickly as I arrived, being able to meet my friends from the internet certainly filled me with a feeling of *hygge*.

In addition to the great beer, I ate many new kinds of food which I will be eager to make when I return to the United States; *spätzle*, *schnitzel*, and a Turkish speciality, the *döner* are all delicious foods seen only rarely in the US. *Döner* especially is wonderful, and the shops which sell it are plentiful; it is difficult to walk more than a block without seeing at least one *döner restaurant*.

The trip was not without its challenges, however. At the start I had to find my way to Karlsruhe using the unfamiliar train system, and very nearly ended up missing my train while changing trains in Mannheim halfway between Frankfurt and Karlsruhe. In addition, I had to negotiate the bureaucracy of the *Ausländerbehörde* (foreigners office) to earn a visa to allow me to stay longer, as I was staying a week or two longer than the 90 days given to tourists in the Schengen region.

Because I went by myself, there were several misunderstandings which caused me not to earn my visa for the last two weeks of my stay until over two months into my stay. I would encourage any interns who would end up in this situation to bring along a native speaker who can explain to you what is needed!

Being able to visit Europe both with friends I had known before my trip – as well as friends made during my stay in Karlsruhe – made my internship here an unforgettable experience. Not only that, but the internship gave me great practical experience which I will be able to apply during my final year of college and ultimately as enter the workforce.



Redaktion: J. Adameit / G. Schanno



©Steuben-Schurz-Gesellschaft e. V., Frankfurt am Main 2014

Cooperation with Hessen-Wisconsin-Society, Milwaukee, USA

Tel: 069-1310822 - Fax: 069-1310873

E-mail: [info@steuben-schurz.org](mailto:info@steuben-schurz.org)

[info@usa-interns.com](mailto:info@usa-interns.com)

[www.steuben-schurz.org](http://www.steuben-schurz.org)