



Research Internship in Mainz at the Max Planck Institute for Polymer Science

Nicholas Gutsche

Germany has always had a special significance for Nicholas Gutsche due to his heritage. Nicholas, student at the Kenyon College, says that he is German on his father's side, and Chinese on his mother's. Therefore, when he was notified of his internship, he was extremely excited. This is what he reported to the SSG-Internship coordinator Juliane Adameit.

Not only was this a chance to do some cool science, it was also an opportunity for me to get to know my roots. From previous experience working in research labs, I had certain expectations of how research in Germany would be done. After arriving, it was interesting to see how reality compared to my initial vision. While there weren't any drastic differences, I found research in Germany to be quite compartmentalized and hierarchical.

These traits are the hallmark of an efficient and orderly system; however, it does differ from the American system in terms of structure and personal interaction. Despite this, everyone at the Institute was friendly, and a thorough knowledge of German was unnecessary, as most people spoke excellent English.



Nicholas Gutsche: "Me at the Institute"

The typical day for me changed with the duration of my stay. As I familiarized myself with my surroundings at the institute, my days became longer and my workload heavier. My project was comprised of different sequential phases in which I employed a variety of techniques for each phase. The first phase was the distillation of monomers and the generation of block copolymers.

The second was the deprotection of these copolymers, and the third was a miniemulsion process, using the deprotected block copolymers as surfactants. Each process utilized different spectroscopic and laboratory techniques; so, at any given time or day, I would be doing a freeze-pump-thaw, distilling or preparing a variety of chemical reactions. This entire sequence of synthesis and application took from three to four weeks to complete, at which point spectroscopic analysis (mostly NMR) would determine my next course of action.

After work, I would bike 20 minutes to the pool in Mainz Mombach where I would swim for two hours, before making a quick stop at the grocery store (usually Aldi) to buy ingredients for dinner. A lot of my free time was spent in and around Mainz. I swim competitively, and I was lucky enough to find a local team that I could train with during my stay. Besides the swimming, there were multiple other options and venues of exploration in Mainz.

The university in Mainz has a well-maintained botanical garden that was quite pretty to explore. Walking around the university campus was also interesting; the university even hosted a summer fest with a bunch of different bands (from metal to various jam bands), beer and food stands. On some weekends, especially during the beginning of my stay, I would just take a day to aimlessly wander and explore the city. Getting to know Mainz better wasn't just something you could do in a day, it was something that had to be done over time. My forays into the city were usually well timed, and I managed to synch my walks with some pretty cool street festivals and farmers markets. These offered further chances to explore the local culture. Simply walking through was an experience in and of itself. Mainz has a charming, but small older section of the city, and its cathedral is beautiful and well maintained.

When I wasn't working, swimming, or exploring Mainz, I was traveling around the country. Germany is advantageous because of its central location. From transportation hubs like Frankfurt,

you can access a bunch of cool cities throughout Europe. While I only traveled throughout Germany, (there was enough to entertain me there) I would highly recommend traveling to other countries as well. Although the first method of transportation that generally comes to mind is the train, I did not end up using the train very often. Most of the time, I traveled with Mein-FernBus, or a long distance bus. These buses were cheap, convenient and as comfortable as the train. The only downside was that travel time was generally longer. With Germany's transportation system I traveled to Leutesdorf, Darmstadt, Heidelberg (as part of the scholars meeting), Köln, Hamburg (see foto), and Dresden.

My internship in Germany was a very impactful experience for me. Not only did it allow me to undertake really interesting, new polymer research, and travel around Germany, it also allowed me to reconnect with cousins that I hadn't seen in (literally) a decade. I learned a lot scientifically and culturally, finally gaining a better understanding for the numerous important contributions that Germany makes to the scientific community and world culture on a regular basis. Whether I was in a club in Köln, the Fischmarkt in Hamburg, a bar in Dresden or back in Mainz doing research, I always had a great time, and friendly interaction with people. This experience is definitely something that I would repeat and recommend to undergraduate students, even if they have no experience with the German language!



On a trip to the new Opera House in Hamburg

I would like to thank all of the people in Germany who made my experience possible: overall supervisor Professor Dr. Katharina Landfester, my project leader Dr. Frederik Wurm, Sabrina Brand, the tech in my lab and especially, my supervisor Sarah Wald, without whom I would have been lost. I can't wait for my next experience in Germany, whether it be a simple vacation, or research towards a degree (hopefully)!

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G. Schanno / J.Adameit / Fotos: N. Gutsche

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Cooperation with Hessen-Wisconsin-Society, Milwaukee, USA

Tel: 069-1310822 - Fax: 069-1310873

E-mail: info@steuben-schurz.org

info@usa-interns.org

www.steuben-schurz.org