

# Summer School Hasselt

11.09.-15.09.2017

In September 2017 I was allowed to join the Summer School in Hasselt, Belgium. The topic of this project in this year was “**Functional Material Engineerig**” and already seemed to be very interesting to me when it was presented by Prof. Dr. Möbius to us in one of our lectures some months before.

I started my trip to Belgium on the 10<sup>th</sup> of September together with my friend Marina, who is also studying “Applied life sciences” in the same semester like me. We arrived at the hostel, which was already booked for us in the evening. First of all, we were curious about our room and our roommates for the week, so we went upstairs to check it out. The hostel looked were modern and tidy so we were already looking forward to a nice week. We also had a very good first impression on our room. The beds were comfortable, the room was big enough, the bathroom was clean and our roommate was Susi, who is also a friend of us. On this evening we were tired because of the journey, so we just went out to get some food for dinner and after that we went back to the hostel to go to bed.

The first morning we drove to Hasselt University by car like on the following days as well. The distance was about three kilometers and it took us around 20 minutes to get there. The week



*Figure 1: Sky Lounge*

at University started with a lovely speech from Wim Deferme in one of the lecture rooms. Right after that the first lecture “Synthesis and formulation for conductive inks” started. Between the lectures we had breaks and coffee which was great to get to know some of the other students. Before noon we had two more lectures about “Nanoparticles for functional coatings: from design to applications” and “Rheological properties of polymeric ink formulations”.

After a delicious lunch we went to the labs to do some lab work about “Material synthesis and ink formulation”. It was really interesting and we were allowed to work mostly on our own. It was very exciting for me to do some lab work in a different lab than I’m used to in Zweibrücken and work together with people from different countries – even if it took some time to get used to speaking English. But after a couple of hours I got used to it again and it wasn’t a problem for me any longer.

In the evening we met with all the other students and Wim Deferme for a social activity, he has planned. We met in a bar called “Sky Lounge” to have a drink and to get to know everybody a little bit better. The bar was beautiful and you did have a stunning view over Hasselt (figure 1). We sat at a table right next to the window and while we were eating some snacks, we were enjoying the society and the outlook.

The second day was all about “Printing and Coating Technology” and before lunch we had again three lectures. The presentations were about “An overview on printing and coating technology”, “Printable biosensors for various food and healthcare applications” and “Introducing nanocellulose for printing and coating: a short review”.

On this afternoon and on Wednesday afternoon as well we were shown many different labs, buildings and research projects. We were able to get an insight into fascinating work, which is done at Hasselt University and other research buildings. In the evening some of us went out to eat some sushi. After we found a nice restaurant, we sat in there and had a funny and especially delicious dinner (figures 2 and 3).



Figure 2: Dinner



Figure 3: Sushi boat

At the following day lectures started at 9 o'clock in the morning again. “Microscopical and crystallographic characterisation”, “Chemical characterisation of coatings with focus on FTIR techniques” and “Characterization of gas permeability for barrier properties of materials/ concepts” were the topics, the professors were talking about this morning. At 12:30 pm everybody was looking forward to a tasty lunch and we all started to get used to be treated that good. After everybody was done eating, we started the second tour to see different labs and research projects as already mentioned before.

In the evening another social activity was planned by Wim Deferme. We met in Hasselt to have dinner all together. Everybody was happy about the choice to go to a typical Belgian “Meatball”- restaurant. We ordered a menu for us together, which included different types of meatballs like Italian style, spicy ones or vegetarian. As side dishes we could choose between rice, noodles and many other different things. In my opinion it was a very nice evening. We were talking to everybody, laughing and we tried new things like the meatballs and Belgian beer.

Some of us decided to look for a cozy place to have a drink afterwards. We went to a bar, called “Beerpunt” where we were served by a funny and very friendly barkeeper. In addition to nice conversations and a pleasant atmosphere, we tested some typical Belgian beers, which were recommended by our barkeeper.

After a long and entertaining day we were glad and a little bit relieved when we went back to our hostel to get some sleep because we knew that the next day would start early again.

At day number 4, Thursday the 14<sup>th</sup>, we listened to some very interesting presentations. We started with “Ultrasonic Spray Coating as an innovative technology for the deposition of a broad spectrum of functional ink”, “Pathways to fully integrated stretchable electronics”, which I personally liked the most, and “End-user authoring techniques for sensor-based systems” in the morning. After a small coffee break we had gained some new energy to listen to the next and last three lectures with the topics “Synthesis and characterization of hybrid diphosphonate mesoporous titania”, “Low-temperature, low-stress solder coatings and their use in a new photovoltaic module technologies” and “Production of thin film – Kestirite and

CIGS) Solar Cells”.

In the afternoon we started our lab work- project. We met in a room, where all the different projects were shown to us. Our exercise was to build a sensor with the conductive ink we produced at the first day at lab. We had to form small groups of three or four people and choose one of the projects. The different sensors, we had to work at in the groups, were for example humidity sensors, distance measurement sensors or a pressure sensor which could be used as a small piano. In our group we decided to build a water level sensor. Therefore we were handed some parts like an Arduino, cables, a servo motor and a cup. Until the early evening we tried our best to put together a working sensor, which needed some time on the internet for research, testing and some despair. But at the end of the day we already had a prototype, which was still not perfect, but you could already guess what its function would be. The rest of the evening we were still thinking about how to fix the problems, we still had with our sensor and we also started to create our presentation of it for the next day.

The next day, which was already our last day in Hasselt, was all about “Lab Presentation Day”. Before the coffee break we worked on our sensors to give them their finalizations. In the end we were satisfied with our work and we were ready for the presentations. As you can see in figure 4, we built together a working water level sensor which was made out of a cup to fill in some water, a servo motor with a kind of a needle to show the volume of water which is filled into the cup and an Arduino, which we programmed before.

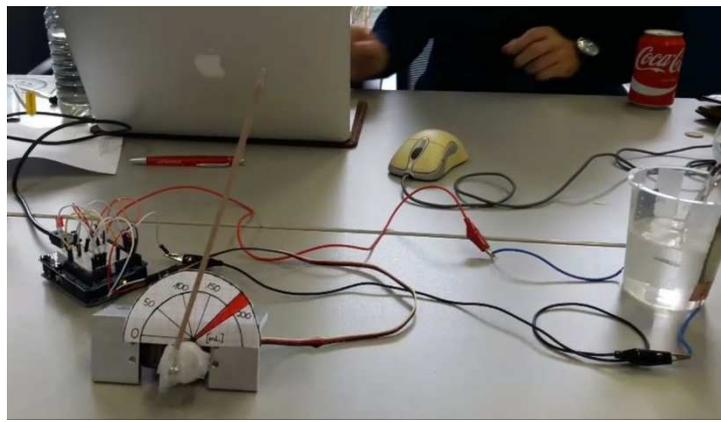


Figure 4: Water level sensor

After the coffee break every group had to do a presentation about their project, which included a demonstration of the working sensor and some slides about the background knowledge we had to use to build our sensors. All the presentations were very interesting to listen to and it was fascinating to see what we were all able to build out of such “simple” parts. I enjoyed listening to every group because all the projects were so different and still so challenging.

After everybody was done, we took some pictures of the group (figure 5) and filmed all the different sensors to have some nice memories.

As a perfect completion for this remarkable week we had a last, but as delicious as every day, lunch all together. After that, we said “Goodbye” to everyone and were thankful that we were able to take part in such an informative and special project.

I’ve learned heaps of new things, got an interesting impression on a science field, that I’m not very familiar with, and got to know new people and a new country I haven’t been to before.



Figure 5: Group picture

All in all I'm very glad, I participated in the Summer School 2017 in Hasselt and I can recommend it to everybody who is interested in new experiences and in learning new things – even if you're not yet very familiar with the subject. If you're open minded, you can get to know new people and new cultures, which for me is very important in life. I also have to say that the organization of this project was very good. It was easy to apply for it because you did get all the information about it right in time and everybody was friendly and helpful.