Final report

Internship abroad

Personal data and general information on the internship

Subject of studies: Material Science (Erasmus Mundus Master MaMaSELF)

Bachelor/Master/State exam: Master

Time of internship: 03/03/2025-02/07/2025

Place of internship: Rennes, France

Internship institution: Institut de Physique de Rennes, Université de Rennes

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1. A bit about me

I'm an Erasmus Mundus Master's student as part of the program, Master's in Materials Science powered by large-scale facilities (MaMaSELF). I had spent my 3rd semester at LMU.

As part of my coursework, I'm currently doing my master's thesis at the Institute of Physics, University of Rennes. My master's thesis aims to understand the charge carrier dynamics in photo-electrocatalysis using ultrafast pump-probe techniques.

2. The Prep before Rennes

I had previously spent my 1st and 2nd semesters in Rennes, and hence the move back was much smoother and easier.

Finding accommodation is easier and cost-effective in Rennes than in Munich. The best bet is to apply for a CROUS hall of residences, as they are the cheapest and most affordable option. I applied a month before my arrival date and got a favourable decision. CROUS operates multiple residences in town, so you can choose where you wish to apply. I applied to the one closest to my University, Residence Beaulieu – 15 min walk to my place of work.

When it comes to sorting out administration and paperwork, it is always better to stay ahead of it. The CMI International helps with all things administrative, so when in doubt, it's better to book an appointment with them. The presence of a dedicated organisation for helping exchange and international students makes life much easier.

Since I already had a valid French residence permit, I didn't have to apply for a new one.

One thing that I missed the most in France was the lack of a drugstore like dm and Roassman…, so pack some extra goodies if needed.

3. The Internship

My master's thesis project involves the study of charge carrier dynamics under different operating conditions for bismuth vanadate using transient absorption spectroscopy. Bismuth vanadate is a photoelectrochemical catalyst, meaning it can use sunlight to drive chemical reactions. This property is useful as we can use Bismuth Vanadate to split water into hydrogen and oxygen, and use these products for our energy needs. However, in order for efficient operation, the charge carrier generated upon photoillumination should be long-lived; unfortunately, this is not the case for Bismuth vanadate. Understanding the charge recombination pathways is necessary for better design strategies.

Figure 3.1 : A glance at the university and it campus, the rightmost image is the institute of physics Rennes.

The internship involves working with lasers, hence I was briefed and trained on the safety measures to follow while working with lasers, the 1st and 2nd weeks were mostly spent on this. Lab experiments commenced on the 3rd week after I started. This was quite a fast transition into experiments, but the support of my supervisor, Prof P. and the group helped a lot.

The project involved a significant part of data analysis using Python, which was a 1st time for me dealing with such huge volumes of data and performing analysis in Python. Day-to-day tasks involved taking measurements at the optical control lab, analysing data, etc…

I was associated with the Department of Materials and Light at the Institute of Physics (IPR), the department hosts PhDs and Postdocs of different nationalities, creating a vibrant and stimulating academic environment. This also meant that I did not face language issues, and even if I did, I had someone to ask for help.

The internship has taught me the 1st steps towards being an independent researcher and motivates me to pursue a PhD. I have also come to understand the challenges of working independently.

Figure 3.2 : The optical control lab at IPR- Harpia transient absorption pump probe system

4. Leisure, Cost and Life in Rennes

Rennes is a much smaller city as compared to Munich, in fact, I missed Munich when I 1st came to Rennes, I still do. Rennes isn't quite like Munich, no beer gardens or U-bahns… but do not

be discouraged, as the city has a vibrant student community and is quite lovely. Though I would recommend staying closer to the city centre if you want to soak in the city vibes more.

Figure 4.1 On the left a shot from the Parc le Gayulles, right A shot from the reception area of CROUS

Despite being a small city, Rennes hosts various activities and events periodically. Keep an eye out on the local newspapers, the ESN network groups, etc. The Fête de la Musique on June 21 is something you can't miss if you are in Rennes. The streets come out full of life.

Rennes is a great place to start a road trip, as it's close to the coast. I could not, however, go on such a road trip primarily due to the lack of a car. However, even if you do not have one, a trip to Mont Saint-Michel is a must. In addition to this, there are beautiful cities like Vannes, Dinard, Saint-Malo, etc, that are just a few hours away and worth a visit. I had visited all of them and they do serve as a relaxing getaway after a hectic week. If you are looking for something more chaotic, Paris is always nearby.

Figure 4.2: Mont Saint Michel: a must-visit weekend getaway, photo taken during visit.

The cost of groceries is high when compared to Munich; however, the cost of housing is much lower. The cost of living is much lower than in Munich, you don't spend as much as on rent, and you can use the extra money for entertainment or save it. There are organisations that provide aid for students. I have felt that Rennes is a much more student-friendly city.

5. Conclusion

Overall, I had a great experience with my internship in Rennes. The department at IPR is a great place for anyone interested in learning about light-matter interactions. The guidance and support that I received there were encouraging and motivational.