



**CHUST – Chemical U.S. Travels**



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## ***Travel Story 2016***

**Name:** Jennifer Astorsdotter

**Year and line of study at KTH:** Master's program: Chemical Engineering for Energy and the Environment, 2<sup>nd</sup> year.

**Which university did you visit? (Name, city, state):** Columbia University, New York City, New York

Time frame: 9 weeks

Visa type: J-1

Insurance: Comprehensive household insurance with extended travel insurance

Scholarship: 20 000 kr from the School of Chemistry at KTH.

**Please write about your travel, internship and time in the U.S. by answering the questions below as detailed as possible, in 1-2 pages. You may answer in Swedish or English.**

### Project description

Can you describe the project you were working on? What subject area did it cover? How did the contact with the Professor/supervisor work? How long was an average day in the lab?

I have been working on a project in the field of heterogeneous catalysis. It concerns the importance of how support materials and active components are combined and treated to make up effective oxidation catalysts. In particular, I have been studying and comparing the oxidation of CO on metal oxide catalysts supported by niobium pentoxide and gamma alumina oxide respectively.

The contact with the professor has been great. I have been working closely with another master student at Columbia University. Together we have been able to discuss our results and our plans on how to proceed with the project. Once a week we have had a meeting with the professor. Every week he has kindly taken the time to meet us and discuss our results, thinking and future plans for the project in quite a lot of detail. Once a month there is a presentation day. On this day every project group makes a presentation for the other members of the research team. At this time there are room for some questions, discussions and for advice. I learned a lot from the discussions during our meetings and from the presentations.

The time I spend in the lab has varied between 6 and 12 hours in a day. An average day I spend 9-10 hours in the lab. I have rarely been coming to the lab during weekends, although, because of the nature of the experiment this is sometimes necessary in order to make efficient use of the laboratory equipment we have access to. Everyone in the lab are kind and helpful. Your own motivation and desire to contribute to the research will greatly affect how much time you spend in the lab.

What new things have you learned during the project? Was your prior knowledge sufficient for you to handle the tasks presented to you? How much responsibility were you given?

I have learned many things during my stay at Columbia University in New York City. I have developed my practical skills in the laboratory concerning both safety during different procedures, as well as, dealing with different analytical devices. I have developed my research thinking and problem solving skills. The devices I have used mostly are:

- TGA (Thermogravimetric analysis)
- Quantachrome for BET analysis
- GC (Gas Chromatography)
- Rotameters and Bubble-o-meter for gas flow control.
- Furnace for calcination

I have been in contact with similar equipment earlier, but at this point my knowledge about them is more detailed. For example, I have realised how TGA can be used for many different purposes and I have learned how to calibrate a GC. I feel more confident about working independently in a laboratory and managing the use of different machines as well as dealing with the inevitable problems that arise when delicate equipment are used. Also, I have learned more about priorities in research. There is an indefinite amount of experiments we can do, but how do we decide which ones we want to spend our limited time on? To answer this question you need to review your research goals as well as your results, which may alter your original goals of the project.

Of course I have learned more about the topic of our research as well. Most importantly, I have developed an optimistic research attitude.

My prior knowledge was sufficient for the project, as I had taken a master course at KTH in environmental catalysis. Also, my bachelor thesis was about heterogeneous catalysis for oxidation of methane. Because I had some previous knowledge in the specific area of heterogeneous catalysis I was able to make a larger contribution to the research than I would have with only the basic knowledge of catalysis given in the bachelor courses at KTH.

### Campus life

What was life like at the university you visited? Campus life, nightlife and potential trips?

Because the campus is located on Manhattan in New York City the things you can experience during your free time are countless. In New York City there are always new places to discover and new things to experience. As several CHUST students visit New York City every year there are many opportunities to experience the city together. I have taken advantage of this. I have also spend a little bit of time with the other people in my lab. New York City is an American, but also International city. It is a great place to get to know new people and learn more about life in general.

I have made a couple of weekend trips: hiking north of the city, shopping in New Jersey, Niagara Falls, Washington D.C. (including a short stop in Philadelphia), and Rhode Island (Providence and Newport).

How much did it cost living in your city? How did you finance the stay in the U.S? Scholarship or private funds? If you received any scholarship, did you need to send any documents to the university in order to receive the funds?

How did you find housing during your stay at the university and how much did it cost? How satisfied were you with the housing situation?

The entire summer (9 weeks) has cost me about \$6000 (54 000kr) in total, including flight, insurance and visa. My rent has been \$1400 a month excluding electricity. I lived in a small, but nice apartment as a lodger. I lived with a Swedish woman who lives permanently in the city. This was great, as she could give me some advice regarding the life in New York City. I liked my living arrangements, even

though I sometimes longed for a little more privacy.

The living expenses are relatively high. I have financed my stay with personal savings. I will receive a 20 000 kr scholar ship form the School of Chemistry at KTH

### Application

Were there any problems that did arise during your stay that you think future students need to know about? In such case, which problems did you encounter?

I did not have any problems with the paper work. The personnel at the university office were all very helpful and easy to communicate with.

What documents did you need to send to the university and what did you need to bring to the embassy in order to get your visa approved?

I got a pile of forms from the university to fill out. I also had to send them a language certificate, a ID photo and a copy of my passport.

At the embassy I needed my passport, grade certificate, language certificate, invitation letter from the university, my DS-2019 and my excerpt from "personregistret".

**May we publish your travel story on the official CHUST webpage ([kongligkemi.se/chust](http://kongligkemi.se/chust)) so that future exchange students can be helped by the information?**

You may indeed publish my travel story.