

**EXCHANGE REPORT****Name**

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Year and semester for exchange

2024 Autumn Semester

Exchange university

Eidgenössische Technische Hochschule Zürich

Degree programme

MSc Applied and Computational Mathematics



My exchange at ETH Zürich, autumn semester 2024

Before departure

I applied for an exchange because I thought it was a rare opportunity to experience something that otherwise might require a lot of administration, preparation and money. Not that it is cheap or seamless to go on an exchange but the collaboration between KTH and the available exchange universities makes the process of moving to another country, getting involved in a community and/or finding housing a little bit easier.

I choose to apply for an exchange specifically at ETH Zürich because the university has a very good reputation and because I was able to find courses relevant for my studies which sounded interesting. When I applied, I was a little bit scared that the courses were going to be a lot harder than those at KTH. This feeling was rooted in doubt from my side and speculation created by ETH's reputation. Because I was prepared to prioritize my studies over other activities available during an exchange, I ultimately decided that I could not let this fear be a factor in my decision. I thought it was important to at least try and see what happens. Other than that, I was very excited about being in Switzerland for an extended period where I would be close to mountains, lakes as well as the rest of Europe.

Upon arrival

I arrived in Zürich about two weeks before the start of the semester. I did not participate in any language course, so these first two weeks consisted mainly of getting settled, prepared and comfortable. I was able to find other exchange students that were participating in the language course during this time through another student from KTH. In retrospect, I think the language course would have been beneficial for making friends.

ESN Zürich organizes a lot of activities the first few weeks as well as during the semester. These include bar meetups, museum visits, hikes and sports tournaments. During the semester ESN also organizes more advanced activities such as ski trips and visits to CERN. There are limited spots available for each activity, and I missed out on a few which sounded fun because I did not look at their website (<https://zurich.esn.ch/>) in the weeks before arriving in Zürich. Just a heads up for anyone who likes to keep busy.

In the first week of the semester the department of mathematics organized a meeting for their exchange students where they went through administrative information about course registration and examination. The number of students in this meeting were limited to a small classroom, in contrast to other information meetings or social events, so it was a good opportunity to find people taking the same or similar courses and to make new friends.

Financials

Zürich/Switzerland is more expensive compared to Stockholm/Sweden in many ways. The additional cost of foreign transaction fees when using my Swedish credit card was not fun either. I recommend getting a Swiss bank account first thing. Creating the account does not cost a thing when using some banks but there is of course a currency exchange fee or similar when putting money into the account.

Public transport in Zürich is comparative in price to that of Stockholm and in some cases even cheaper. However, this might depend on where you live as the zones of the public transport network are a bit annoying. Download the ZVV app to find routes and buy tickets. There is a function in this app where you just activate a check-in ticket, and they figure out where you travelled. In theory I think this function tries to minimize the cost of your route but it's easy to forget to check-out when you have arrived.

I cannot recall any mandatory fees connected to the school however, the city of Zürich takes out a fee when you register with the authorities (this must be done within the first 14 days after your arrival). I paid 110 CHF however, the fee is cheaper if you can prove that you get a scholarship for your studies either through SEMP or Erasmus+. I could not prove that I got the Erasmus+ scholarship because I had no internet on my phone, so be sure to have this paperwork available somehow.

Eating out is insanely pricey in my opinion but ETH and UZH have food courts called *mensa* where you can get a nice lunch for 5-7 CHF. In general, *mensa* is a nice option! Other than that, I recommend going to the closest LIDL for groceries and snacks. I didn't do this, but I know that many people took advantage of organized events as often as they could to get free lunch and sometimes even dinner.

Accommodation

There are a few ways to get accommodation in Zürich. First, the university offers housing to several applicants if you apply in time. Most people I met got a room through this process and even though some of these places meant sharing a kitchen with many people it was perfect for meeting new friends and study partners if you put some effort in. It is easier to talk to people when you pass them multiple times naturally than when you must actively look for them. In contrast, I found my housing through Facebook where I put out an ad in a couple of groups. This is not a reliable option, but I tried to be as careful as possible with fact checking and video calls. I believe this option is more expensive in general but because I shared the cost with another exchange student it became a little bit cheaper than the housing I got offered by the university. In general, I think students pay between 600-900 CHF best-case scenario.

University and studies

ETH Zürich is a technical university with similar departmental structure and coursework as KTH. A big difference to my previous studies is that at ETH there is only one exam period at the end of the semester and less time, if any, is dedicated to assignments during the semester. This might differ between courses and for students with a different background. For example, I know exchange students from the department of computer science who attended courses with more regular assignments. In general, I think it is a good idea to look at the exam structure of your course selection at ETH to make sure the exam period is not packed full of 30 ECTS. This is of course a personal preference; it might be more important for you to prioritize courses that sounds most interesting.

In my case, the lack of continuous assignments meant I had to be more conscious of keeping on track and making sure I understood the material thoroughly. For me, when I have bigger assignments, it is easier to understand what I don't understand. So, this difference was an adjustment and during the exam period it became clear what course-material I had managed to understand in a deeper way and which I had brushed through thinking it was simpler than it was.



Courses

My course selection was based on interest and relevance to my study field. I wanted to continue building knowledge on numerical methods for PDEs and increase my intuition of the physical settings these methods can be applied to.

401-4671-00 Advanced Numerical Methods for CSE
(10 ECTS, elective, [Link to course description](#))

The main topics of this course were BEM (50%), Hierarchical Matrices (25%) and Hybrid Modelling (25%). The examination consisted of four homework coding project with a code review and one 30 min oral exam. This was my favourite course by far during this semester. The lecturer was engaging and the material interesting. They had issues with the code base for the homework's which meant you could spend a long time debugging and not learning much which was frustrating, but this should improve with later course offerings. The lecturer recognized this and cared more about one's ability to discuss the material than the details of the submission/code which was good.

401-4656-21 AI in the Sciences and Engineering
(6 ECTS, elective, [Link to course description](#))

This course covered the use of AI in scientific tasks across physics, chemistry, biology, and engineering. It was a broad course in my opinion where many use cases and concepts were introduced but covered with some detail which was fun. The examination consisted of one project released in December and handed in on 21th of January. In previous iterations of the course there have been two smaller projects: one in the middle of the semester and one in January. I don't know how they will do it moving forwards. I thought this course was fun as well as it creates some intuition on the pitfalls and opportunities of AI in these fields while also focusing a fair amount on the mathematical detail.

401-7855-00 Computational Astrophysics (University of Zurich)
(6 ECTS, elective, [Link to course descriptions](#))

This course focuses on computer-based models of astrophysical systems with simple examples of computer programs. The examination for this course consisted of a project released in December to be presented in the beginning of February. The course content was interesting, but the lecturer was somewhat hard to follow unfortunately.

151-1116-00L Introduction to Aircraft and Car Aerodynamics
(4 ECTS, elective, [Link to course description](#))

The main topics of this course were Aircraft Aerodynamics and Vehicle Aerodynamics. I enjoyed this course as well. The lecturers were good at explaining the concepts and interesting discussions were started during class. The examination consisted of one open-book multiple-choice exam.



City and country

The city of Zürich is nice, and the people are friendly. I met mostly exchange students so I am not entirely qualified to describe the culture of Switzerland but there are some things that stand out. There is a trust system throughout the community where, for example, you do not expect anyone to steal things you leave on a table. There are also water fountains everywhere with clean, drinkable water. Now that I am back in Sweden it feels weird to buy a bottle of water if I am thirsty.

When talking about cultural activities, there are several such events during the fall semester including the annual autumn cow parades, fondue evenings and candle dipping. It is also quite fascinating that Switzerland has four national languages and even though Zürich is a mostly German speaking area you regularly get short answers in the other languages as well.

Leisure and social activities

Outside of my studies, Zürich was a great place for being outside. Walking up and around Zürichberg and Uetliberg are good evening/weekend activities. These hills are basically in the city but still allow for incredible views of mountain ranges when the weather is nice. When there are few or no clouds you can also just walk around the university area and see mountains between the houses. During my stay there were many days of thick clouds or fog which meant you could not actually see the mountains, but the city was still nice to walk around in. You can find several hiking trails, lakes and smaller cities such as Basel and Lugano for day trips. I especially liked visiting Lugano and hiking by a lake called Oeschinensee.

As part of being a student in Zürich, ASVZ offers free gym memberships and free sports classes across the city. This is a cool opportunity to try new things and keep active. They have almost everything you can think of when it comes to sports including climbing, sailing, Hip-hop dance, trampoline, cycling and so on. In some cases, you must have previous experience to attend the class, and you might have to buy appropriate equipment.

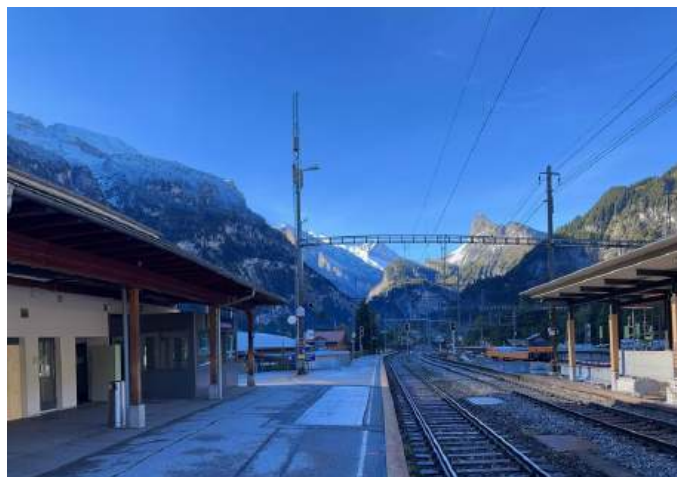
Additionally, during my stay I saw a movie at Zürich film festival, swam in lake Zürich, played poker and ate dinner at Haus Hiltl which was founded in 1898 and is the oldest vegetarian restaurant in the world according to Guinness World Records.



Sustainability

I travelled from Stockholm to Zürich by train using interrails 10-day pass and a similar pass on the way back. This allowed me to travel relatively cheap once in Switzerland as well. It is a reasonable train ride with only one stop in either Hamburg or Berlin depending on the month you are travelling. Even though it is only one stop, the length of each train ride is of course quite lengthy. In my opinion this is a good alternative especially if you have enough water with you, you have slept okay and you bring something to keep you busy.

Zürich makes it expensive to throw away combustible garbage and hard but mandatory to sort your garbage. There are only so many places where you can throw away for example glass, carton and plastic. Ultimately this forces the ones who wants to save money and/or time to be more restrictive with their waste. The university encouraged some sustainability with posters and such during a sustainability week.



Other recommendations and observations

Switzerland is a great place to live, and I enjoyed my time studying at ETH. As a general suggestion I would recommend looking at exchange studies at EPFL in Lausanne as well if you are interested in ETH Zürich. As I understand it, they have a very good reputation and while I have not been in Lausanne myself, I have heard it is a beautiful city.

If you do end up going to ETH Zürich, I recommend studying at Grüne bibliothek in the CHN building and if you are in the same or a similar study area as me you can fetch free coffee, beer and (maybe) sparkling water in the student associations (VMP, AMIV, VIS) common area.