



NEWSLETTER

The Moss Wall: A Way To Improve Air Quality?

Experiments and theoretical considerations today, show that greening measures help reduce the concentrations of air pollutants in the ambient air. In addition, vegetation helps cooling surrounding air in urban areas, which is very helpful in summer for example. In fact, rain drops, stored in the ground and the leaves of the plants, need energy to evaporate. This energy is withdrawn from the ambient air, in the form of heat, which leads to the cooling effect. Therefore, vegetation, which also increases the well-being of urban residents, is an asset that should be definitely consider when dealing with quality of both air and life.

For this purpose, a moss wall was installed along a section of the national road B14 Cannstatter Straße in Stuttgart, between the Schwanen tunnel and the LUBW monitoring station in Neckartor, Stuttgart. The

heavy traffic at this location is controlled at a speed limit of 50 km/h, hence emissions can be assumed to be constant. In addition, very high concentrations of pollutants are usually found near LUBW station. This site is therefore suitable to see how effective the moss wall will be in reducing Particulate Matter (PM) and Nitrogen Oxides (NO_x) concentrations.

A noise wall surrounds the Schlossgarten which prevents the noise from the traffic reaching the Schlossgarten and acts as a soundproof barrier. The moss wall extends over a length of 100 m between the road edge and this noise barrier; directly in front of the noise barrier. It is followed by a "comparison wall" that also extends over a length of 100 m, without bearing moss plant on it.

>> **Continues**

But why, out of several options out there, is the moss wall chosen?



Moss wall picture over the B14 Avenue

CONTENTS

TITLE STORY



Interesting research topics

THE MOSS WALL
A way to improve Air Quality?

1 & 3

STUDYING WASTE



What is going on in the
M.Sc. WASTE?

EXCURSION TO ZUGSPITZE

Hohenpeißenberg and UBA Monitoring Stations

6

WASTE INTERCULTURAL MEETINGS (WIMs)

Christmas WIM

Brazilian WIM

Arabian WIM

7 - 8

WASTE SORTING WASTE

„I did sort WASTE“

9

WASTE BUDDY PROGRAM

10

WASTE NEWS



What is coming up in the
M.Sc. WASTE?

GRADUATION CEREMONY 2017

3

RECYCLING CROWD FUNDING

4

reCIRCLE Stuttgart

GREEN KURDISTAN PROJECT

5

Updates

NEW M.Sc.WASTE LOGO

5

Interview with the winner of the Contest - Nelson Rincón

LIFE AFTER WASTE



What is happening after the
M.Sc. WASTE?

ENVIRONMENTAL ENGINEERING IN COLOMBIA

11

Prof. Baumbach experience

KEEPING ALIVE THE WASTE SPIRIT

12

Meeting WASTE Friends abroad

WASTE CLUB DESCRIPTION

12

Be a part of the Professional Network!

FUN WITH WASTE



What is done besides studying in the
M.Sc. WASTE?

WHERE TO GO IN EUROPE?

13

Travel to Egypt

FUN WITH WASTE

14

Games and more

CULTURAL AGENDA

15

>> The Moss Wall: A Way To Improve Air Quality?

It is because moss walls might be more effective in reducing PM and NO_x concentrations than other plants. Here are a few reasons why:

- 1 Mosses have a surface area that is 30 times larger than other plants. This greatly influences the separation efficiency of a plant.
- 2 Mosses' surfaces are negatively charged, which helps the surrounding particles to adhere on the moss surface through electrostatic attraction forces.
- 3 The evergreen mosses are more active in winter, when the concentrations of air pollutants are higher, than in summer. Other plants have an inverse behavior, they are more active in summer, when the concentrations of air pollutants are lower and lose their leaves in winter, when their cleaning effect is much more necessary than in summer.
- 4 The organic constituents coming from emissions are broken down by the bacteria living on the surface of mosses.

Laboratory studies showed that moss reduces fine dust for instance, but until now there are no quantitative results in large-scale cases; hence this case study. In fact, the measurement strategy here consists of comparing the PM and NO_x concentrations on the road side in front of the noise wall, in both the presence and absence of moss plant on the wall. The pollutants' concentrations behind the noise wall, at a further distance from the traffic, are also to be considered for comparison. At both these locations, all measuring devices are similarly installed for effective comparison.

The PM – PM₁₀, PM_{2.5}, PM₁ – concentrations (µg/m³) are being measured continuously with aerosol spectrometer from Grimm and Pallas companies. On the other hand, the continuous measurement of the NO_x, NO₂, and NO concentrations are being held with the use of a chemiluminescence technology of the 200A MLU instrument. Additional continuous measurements of meteorological parameters like wind direction, wind speed, humidity, air temperature and precipitation, are carried out in the vicinity of the investigation site. The wind measurements near the moss wall are used to determine the transport of air masses from the road to the moss wall.

Finally, in order to complement the continuous measurements, discontinuous ones are also held using NO_x and NO₂ passive samplers – from the Passam company – at 12 different locations. These comprise both horizontal and vertical distribution of the concentrations in the vicinity of the moss wall. In fact, some samplers are installed at three different heights, both in front of the noise wall and behind the noise wall; along both the moss and comparative walls.

The measurements on the moss wall will take place over a period of a year and a half, and if it leads to the expected results, it will definitely influence the way we deal with air pollutants.

Chawk Chamoun
M.Sc. WASTE student, generation 2016

GRADUATION CEREMONY 2017

WASTE News

M.Sc. WASTE GEN. 2015 GRADUATION CEREMONY

Friday

December 1, 2017 16:00 - 20:00

Pfaffenwaldring 47, Room 47.03

University of Stuttgart, Campus Vaihingen

M.Sc. WASTE Graduation Ceremony 2017, will celebrate the end of the studies of Generation 2015. It will be carried out in Pfaffenwaldring 47.03 on December 1st of 2017 during the afternoon hours.

Degree awarding, prizes for the best students, artistic performances and speeches will be featured during the official part of the ceremony. Afterwards, a small reception is planned to end up the evening with exotic international finger food prepared by the M.Sc. WASTE Students from Generation 2016.

It is a great occasion to congratulate the new M.Sc. WASTE Graduates and to spend a balmy evening together as the WASTE Family.

We look forward to seeing you there!

WASTE Office Team

RECYCLING CROWD FUNDING: reCIRCLE Stuttgart

SIMPLY SAID, reCIRCLE STUTTGART IS A ZERO WASTE SYSTEM

FOR TAKE-AWAY FOOD IN REUSABLE CONTAINERS

The idea is based on the community spirit: The more people use the reContainer, the faster the reCIRCLE network grows and the easier it is for everyone. By using the reusable reBoxes and re-Becher you are protecting the environment as well as transporting your food pollutant-free – to your workplace, a sunny spot outdoors or simply to your home. You can get the reBox for a deposit of 10 € at the restaurants themselves while ordering your food. Simply return them at any participating restaurant, the same day or some other time and you will get your deposit back.

reCIRCLE Stuttgart: Unpacked noodles

The reCIRCLE system was firstly tested in 2014/15 in Bern, Switzerland with 12 restaurants. On 19. May 2017, the reCIRCLE initiative was granted with the Swiss environmental award. A great appreciation for the reCIRCLE founder Jeannette Morath, who could convince already more than 60 Swiss gastronomies distributed all over the country. A 6-months pilot phase in Stuttgart shall provide the waste free take-away food experience for people in and around Stuttgart.

The Kick-Off event in Stuttgart took place at the Übermorgen Markt at Marienplatz and was very successful. One of the participating reCIRCLE restaurants, the Super Yami, was providing a food stand at the market where the reBoxes could be directly used. The feedback of the customers was throughout positive. Even the environmental minister, Franz Untersteller, paid a visit at our information stand. But not only the visitors of the Übermorgen Markt were excited, the Coffee experts from Monsieur Renards Garten started using the reBecher for the coffee and thus decided to join the reCIRCLE pilot phase which started on 1. June 2017. Thanks to the direct contact to Stuttgart Citizen and the local media at Übermorgen Markt, the crowdfunding campaign on www.startnext.de/recircle-stuttgart gained momentum so that the first funding threshold of 2000€ was reached shortly after the market. The campaign is still running until the 14. June 2017 with the goal to widen the pilot phase for more participating restaurants with more reBoxes. Furthermore a benefit system should be established which enables a higher value for active reCIRCLE users like free entry to the movies or the TV tower in Degerloch. reCIRCLE Stuttgart was initiated by a group of local volunteers from Greenpeace (like myself) and Cradle-to-Cradle (known

by waste students of the module 'international waste management' – thanks to Mr. Clauß), who formed the 'Mehrweg Initiative Stuttgart' (MIS) and established reCIRCLE Stuttgart. All MIS members volunteer passionate for the reCIRCLE project to provide a waste free environment in a clean and environmentally friendly city.

The initiative is open for new motivated members to actively initiate circulatory systems of all types. Right now we are specifically looking for promoters who join us at lunchtime at the participating restaurants to convince more people of the benefits of reCIRCLE. Anyone who wants to join in or is curious about more is warmly welcome to come to our meetings. Email me on manuel.lorenz@recircle-stuttgart.de or contact our Facebook page. There you can also share your reCIRCLE experience with friends and family, as well as tag your favorite restaurant to motivate it joining reCIRCLE. All participating restaurants are listed on the homepage www.recircle-stuttgart.de. Of particular interest for students and lecturers on Campus Vaihingen is the Pokkez store located inside the International Center IZ. A cooperation with the Studierendenwerk is planned, not only regarding the food boxes, but also for coffee cups. Feel free to send me feedback and advise, maybe you even want to start reCIRCLE in your city!

Cheers to a successful pilot phase and enjoy your meal!

Manuel Lorenz
M.Sc. WASTE alumnus, generation 2014
& Maria Pinkser

GREEN KURDISTAN PROJECT: Updates

We want to inform you about the latest actions of Green Kurdistan Project. In May, we signed in for a competition of Stuttgarter Change Labs. This is a project of the university, which is funded by the Ministry of Science, Research and Art Baden-Württemberg, to support engagement of students for a more sustainable world. 10th of May the 12 winners were announced. In a Workshop one week later we were told to get support for 2.500 Euro, which we can invest in the project.

Also we took some other action to make the project more popular. We did a stand with another initiative at Übermorgen Markt at Marienplatz. A lot of initiatives, shops and programs for a sustainable consumption and lifestyle were presented. We got a lot of positive feedback and could collect about 200 bags. At the end of May there was another event, taking place in IZ (Office of international Affairs) which was organized by Stuttgarter Change Labs. At the Markt der Möglichkeiten we informed other students about the project and how to get involved in social engagement at the university. The next steps will be to make an event in ÖZ (Ökumenisches Zentrum) to label all of the collected bags. We want to print a recognizable symbol of all of the bags. There will be a presentation about Kurdistan and the problem of waste management. You are all invited to join and have some Kurdish Food and Drinks and to become creative to print and design the bags.

Rzgar Al-Bewani

M.Sc. WASTE student, generation 2015



After Rzgar's visit to Kurdistan in May, the project was introduced in a Kurdish TV show. The next step in Kurdistan is to bring the bags there, so that the partner organization can distribute it. Then to produce the bags in Kurdistan itself. Therefore we will buy sewing machines, so women can make it at home.

NEW M.Sc. WASTE LOGO: Interview with the winner of the Contest

The last May 5th was announced the winner of Waste Logo Contest 2017. I had the opportunity to meet Nelson Felipe Rincón Soto, student of Waste Master Program – Generation 2016, who won this contest.

- 1** Mr. Rincón, how did you feel after winning the Waste Logo Contest 2017? Did you expect to win? **4** Finally, did you participate in similar contests before? If so, how was the experience?

Actually, I really did not feel surprised. I knew that my Logo embraced all the fields of the Waste Master Program, however, I was a little bit concerned about how childish my logo could be. Of course, there is room for improvement, but I somehow expected to win with a colorful design.

- 2** What was your motivation to participate in this contest?

My biggest motivation to participate in the contest was to have the possibility to attend the AICHEM Fair (One of the prizes that Mr. Rincón won). Because it has always been one of the events that I wanted to visit. I have been following this Fair since I began with my Chemical Engineering studies in Colombia, and now I am glad that I will have the chance to be a part of it!

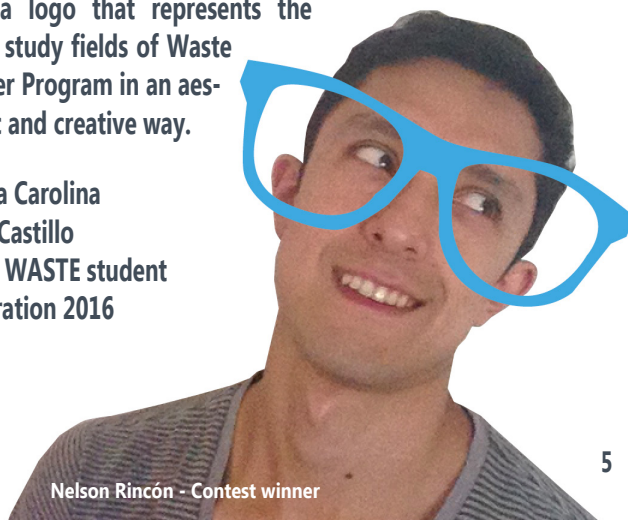
- 3** Was it easy for you to create the logo? How much time was necessary to do it?

It was challenging because it had to incorporate the three main areas of the master program in one single design. However, I did the preliminary design in one inspirational moment during an Air Quality Class. I took around eight hours in total to come up with the initial Logo Proposal.

I have not participated in a similar contest. However, I have done some logos during my previous work in the Colombian Association of Chemical Engineering. The creation process is always tough, there are multiple variables to take into account, and sometimes stressful when the results are not like you expected in your first drafts. Anyways, I enjoy every second of spending my time vectoring drawings in Illustrator!

It should be noted that this contest was organized by Waste Office and sponsored by the Waste Club Stuttgart in order to find a logo that represents the three study fields of Waste Master Program in an aesthetic and creative way.

Grecia Carolina Solís Castillo
M.Sc. WASTE student
generation 2016



Nelson Rincón - Contest winner

EXCURSION TO ZUGSPITZE:

Hohenpeißenberg and UBA Monitoring Stations



Group picture at UBA Monitoring Station, Zugspitze - Germany

On June 7th, 2017 we had the opportunity to visit Deutscher Wetterdienst station in Hohenpeißenberg followed by a visit to Umweltbundesamt Air Quality Monitoring Station at Schneefernerhaus. Excursion that was organized by our lecturer Dr. -Ing. Ulrich Vogt and Prof. Günter Baumbach was full of fun, laughter and some sweats from the challenging but worth-while hike towards Zugspitze. Throughout the trip, the knowledge we gained from the measurements/monitoring stations definitely made it an interesting and once in a lifetime experience.

As the bus left from the IFK, we loaded the trunk with our backpacks and got going early morning. As we arrived to Hohenpeißenberg for the DWD (Deutscher Wetterdienst) station, we were welcomed by our guide and were given a presentation about the facility and a general overview. We were then toured to the laboratories where the measurement instruments took place. We got familiarized by the measurements done for pollutants including NO, NO₂ and O₃. Heading up to the tower, next laboratory was for the measurements of the reactive trace gases such as VOC's in ambient air. Lastly, we walked up to the rooftop of this facility accompanied by a great view of the Bavaria region and more measurement instruments.

Our excursion followed by picnic by a lake that's on the way to our next destination, the town of Ehrwald, Austria where we stayed overnight. In the early morning, we made our way to, what I like to call 'greatest hike I ever done'. Clear blue sky over at the higher altitudes kept us warm, in fact sweaty, through the snow, glacier, all kinds of slopes and rocks. After about 7 hours hiking we made it to our guided tour appointment like a true hero at 4 pm. This took place at the Schneefernerhaus. It is situated not far from Zugspitze which is the highest peak

in Germany. This facility was the Umweltbundesamt Air Quality Monitoring Station. Our tour began, lead by Dr. Reis there, where we were introduced about the history of this facility. We went to measurement instruments with a very interesting talk about datas that are being put together as well as global scientific issues. This research station mainly measures greenhouse gases, aerosols and chemically reactive atmospheric trace gases. Both UBA Monitoring Station and Hohenpeißenberg facilitate in which it contributes towards the GAW (Global Atmospheric Watch). After being accommodated there in the facility, we had our share of the beautiful view of the Alps. Next morning we were off to our way to Zugspitze! The highest peak in Germany was remarked by a yellow monument. Another guided tour was waiting for us there at DWD (Deutscher Wetterdienst) station. This mainly served for the meteorological purposes and measurements regarding this took place. Our excursion was finalized with this station and then on, we got busy enjoying the view, figuring what direction was Austria, Switzerland and Germany, feeling truly global :)

As a group we started to make our ways back to Stuttgart. This was a trip which we bonded with classmates, laughed and strengthened ourselves mentally as well as physically I must say. I can't forget to mention about the cards game Palermo which we played with passion in the train, that made the time go by faster. Thanks again to Dr.-Ing. Vogt, Prof. Baumbach and our course director Carolina for making this trip happen and everybody who we made it!

Buket Durmaz
M.Sc. WASTE student, generation 2016



WASTE INTERCULTURAL MEETINGS (WIMs)



Christmas WIM

M.Sc. WASTE Students and Course Director celebrating Christmas WIM

“On Friday December 9th of 2016, the M.Sc. WASTE Program closed the year holding the wonderful Christmas WIM, the first WIM organized by the new M.Sc. WASTE Generation 2016”

Having people from all over the world, with different cultures and religions, it was an amazing night with more than 60 people among M.Sc. WASTE students from generations 2014, 2015 and of course the new generation 2016, as well as professors, IFK/ISWA staff, friends and family.

Since it was the Christmas WIM, the main event of the night was the interchange of gifts, switching and stealing the gifts one from another, it was an enjoyable game, where everyone participated and went home with a nice little Christmas gift.

Winter arrived to Stuttgart, so room 23.01 was reconverted into a fully decorated Christmassy space. Lights, candles and more everywhere made the room looked outstanding, and lots of incredible food done by the WIM workteam from Generation 2016. Also, the big blackboard was filled with Christmas and holiday's wishes written in all the different languages from all the attendees, making everyone participate and share time together.

All night long Christmas carols from different countries and languages were played, in Spanish, English, German, Arab, Portuguese, etc, and meaningful (Christmas related) pictures of the new waste students were shown so we can learn and get to know as better.

Finally, it was a great night, the first WIM organized by Generation 2016 it was all a success; people ate delicious food, drank the famous German Glühwein, share gifts and had a warm and happy night in the cold German winter.

Bernardo Guevara
M.Sc. WASTE student, generation 2016



A famous quote by Anastasya O.,- Russia: ‘Culture is something that unites people’ and that’s what WIM (Waste Intercultural Meeting) is about.

This summer, the 65th WIM was organized to represent the Arabian culture. An evening was held on May 5th, 2017 in a lecture hall of IFK, Pfaffenwaldring 23. Students from Lebanon, Morocco, Egypt and Palestine had a lot to talk about their history and culture. The evening was such a release for all the students from academic pressure. It was so interesting to see how people from the same religion and language had such a diversified background along with different cuisine, social activities, music and art.

After finishing with the presentations from all four countries, the most interesting part of the evening came when organizers took us to the corner where amazing and delicious food was served. Generally, I am a meat lover and food was all vegetarian but still it was so mouth-watering. This was not the end of such an amazing night. There is a lot more to tell you from my side. Music played was already so mesmerizing and people came for dances the moment they finished their food. We were all busy in making photos for a lifetime memories. One more thing to mention was the beautifully organized ‘Sheesha corner’, where we all sit together on the same floor and enjoyed some general talk. This was not a tradition of the previous WIM’s.



Chalk Decorations during Arabian WIM

An amazing moroccan tea was served at the end in a traditional cutlery and it was very nice to feel their culture with every single sip we had.

I think I need to wind up this night by saying that it really left some fond memories to cherish in future. Last but not the least, we helped the cleaning team and said good-bye to all the participants of the night who gave us such a memorable time.

Arouba Hussain
M.Sc. WASTE student, generation 2014



WASTE INTERCULTURAL MEETINGS (WIMs)

It was an honour to show all the students, professors and guests another side of Brazil apart from all clichés, as Samba, Carnaval and nice beaches. Brazil is an enormous country, with approximately 200 million inhabitants and occupies a great part of South America, therefore there is a huge variety of traditions, cultures, landscape, food and even the Carnaval is different depending on the location, so the meeting started with a presentation from the students about these different topics, as the division of the regions according to different nationalities – the ones that colonized each region, either as conquerors or refugees – for example Germans and Italians in the south, Japanese in the southeast, Lebanese in the centre-west, many African countries in the northeast and a mixture of indigenous people with European in the north of the country.

Because of this mixture, it was showed the reason we have so many different religions, national festivals and typical food. Another topic was the amazing landscapes and biomes that are part of the country, not only the famous beaches and the Amazon forest, but also the deserts, the wetlands, the mountains and the variety of species around the biomes and how rich is the Brazilian ecosystem. At the end of the presentation it was told about the food, some famous people from Brazil and some nice curiosities about the country (That even we didn't know about!), and it was finalized with the different types of Carnaval, the dances, the music and how people celebrate this such important party around the country. Some questions were asked to the public to know how much people knew about the country and they were awarded with our typical peanut sweet (Paçoquita).

Dr. Daniela Neuffer hosted a second presentation to introduce to the audience the Double Degree Program of University Stuttgart and Universidade Federal do Paraná, in Curitiba, and her amazing experience living and working in cooperation with Brazil so people could get to know better how does it work and clarify questions.

After the presentations, a table full of different typical foods was prepared for people to taste a little bit of Brazil, with Feijão Tropeiro (beans with bacon and a typical flour), Empadões (chicken and vegetable pies), Pão de Queijo (cheese bread), Pavê (chocolate and vanilla mousse), Maracuja Mousse, Brigadeiro e Beijinhos (chocolate and coconut sweets), Bolo de Fubá e de Cenoura (corn and carrot cake), Romeu e Julieta (guave paste with cheese). And of course the famous distillate drink made out of sugarcane, popular known as "Cachaça" was distributed among all the guests!

A meeting full of good energy, good music and a very nice and participative public was held on the following hours, just as we wanted people to get to know our country, even though full of problems as a developing country, that we are very proud of it and we like to make people happy and feeling home!



Paula Daolio Silveira
M.Sc. WASTE student, generation 2016

On the 3rd of February of 2017 took place in IFK the 64th Waste Intercultural Meeting, featuring the Brazilian WIM, hosted by all Brazilian students and alumni from the double degree and the regular M.Sc. WASTE program.



Brazilian WIM

WASTE SORTING WASTE: „Mommy, I did sort WASTE“

I remember this one lecture from Solid Waste Management during the winter semester... the third one to be specific, where we have been taught about the waste composition. The professor showed some pictures of students around a table, they were sorting organic waste for one of the government's projects to estimate the waste composition in the Stuttgart Region. That moment, somehow, stuck into my head!, particularly due to the fact of seeing students sorting stinky waste on fancy leather jackets!

Four months later, I was walking by the ISWA, defying the fact of being late for class, and suddenly I saw an announcement looking for HIWIS for a Waste Sorting project. The leather jacket came back into my mind. That night I wrote an email to contact the project's responsible and a few weeks later, I was signing the contract and knowing for the very first time my German Social Security Number. Afterwards, the sorting team hold a meeting to set the working times, to define the sorts of waste to be classified, and last but not least: The sorting outfit... which consisted on security boots, a fluorescent vest and deep blue overalls (Containing the Stuttgart University logo, making them perfect for selfies).

I was definitely not sure if the best way to start the Summer was sorting waste, but I was determined to experience that work. We were lucky, at least that was what we have been told: The waste to be sorted was paper! Really, I never thought that the paper could be classified in so many types. The main aim of this project was to determine the mass composition of paper waste to specify how much of that corresponds to packing. Thus, it would be possible to charge the companies for the management of the waste that they are producing (which is associated to the amount of packing).

They were 5 days of sorting, understanding the difference between paperboard, papers and packing. Only with two hours of sorting, the prevailing trends in people's consumption were easily noticeable. Overall, I learned how to work efficiently as a team, I got to know some colleagues from older generation and I learned the lyrics from seven Reggaeton songs that were frequently played during the working shift. Any WASTE student can apply for this experience, learn how to sort waste and how to work in a team. After all, I can proudly say that I did sort Waste during my M.Sc. WASTE journey and I did it without a fancy leather jacket.

Nelson Rincón Soto
M.Sc. WASTE student, generation 2016

Sorting Categories: Paper



Magazines and big-sized printed papers



Cardboard packaging



Paper packaging



Small paper (Scraps)



Hygienic papers



WASTE BUDDY PROGRAM

„Buddy Service: My Experience“

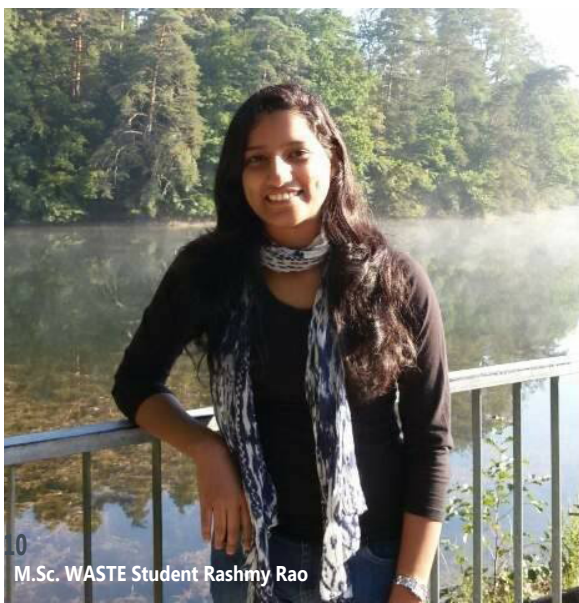
On the first day, I met Arouba; the first person I met in the University. She gave me a very warm welcome to the University. She made me feel that we knew each other since a very long time and we were no longer strangers. She had provided me a welcome package and guided me through the insurance documentation and collecting of my room keys. She walked with me up to my room and made sure if everything was comfortable in there. We feel blessed when we know that there is someone with us to help and support in a new land. That is the best feeling we get through this Buddy Program.

On the second day, I met Savina and she helped me with the registration at Rathaus. I was surprised to see her come all the way till Rathaus and wait for my registration to be completed. She also gave a quick glance on the facilities in and outside the University; which is important for the new students. This provided a significant impact on me about the culture in the department of WASTE in the University. I would like to show my gratitude to my Buddies who made me feel my best during my initial days in the University. I also thank the WASTE Office for organizing such a service for new students.

When I had applied for the WASTE program, and exactly after a month I received an E-mail confirming about my admission, I had no idea how am I going to reach the University. Imagine we are landing in a new city and we have no knowledge about the means of transport, the ticketing service and other facilities. We only know there are different coloured trains namely S-Bahn, U-Bahn through Internet surfing but nothing more than that.

It is then, I receive another email from WASTE Course Director informing about WASTE Buddy Service program. I was surprised to know that such a service existed. I applied for the Buddy Service to help me with initial documentation in the University. I was very happy to get a spontaneous response with two buddies allotted for me. They were Arouba Hussain (Gen 2014) and Savina Padumane (Gen 2015). They were in constant contact with me through E-mail. They made me feel very comfortable before my arrival and I knew I was being guided through my journey from India to Stuttgart, Germany.

Rashmy Rao
M.Sc. WASTE student, generation 2016



M.Sc. WASTE Student Rashmy Rao

I am pleased by the service and it is delightful to have the volunteers of the Buddy Service Program help the new generation of students of WASTE relentlessly in midst of their hectic schedules. It is now the students of WASTE generation 2016 are motivated to extend our support to all new students of generation 2017, in helping them feel at home just like we had experienced.

ENVIRONMENTAL ENGINEERING IN COLOMBIA:

Compact course in Air Quality Control given by Apl. Prof. Günter Baumbach at the „Universidad Del Norte“ in Barranquilla

Barranquilla is with 1.2 million inhabitants the fourth largest city in Colombia. The former WASTE student Dr.-Ing. Carlos Alberto Pacheco Bustos founded a Master Program of Environmental Engineering at the University del Norte in Barranquilla. To cover the part of „Air Quality Control“ he invited me for end of March / beginning of April 2017 to present this subject in a one week compact course. The lectures lasted over six days from eight am in the morning until half past six pm with two hours lunch break. I covered the whole spectrum from natural air pollution over pollutant formation during combustion processes, pollutant dispersion in the atmosphere with the important role of inversions which cause high concentrations in Bogota the capital of Colombia. Chemical reactions with ozone formation were the next part.

Then we discussed the most important impacts of air pollutants in combination with indoor air quality. An important focus was laid on the measurement methods since without knowledge on the emissions and ambient air concentrations no effective measures against the pollution could be realized. Finally technical methods for reducing the air pollutants closed the compact lecture week. As practical supplement traffic countings were realized. The pictures 1 and 2 show an example of this practical work.

The second practical illustration of the theoretical lecture courses was the visit of an air quality monitoring station in a suburb of Barranquilla. In pic 3 the whole group with Carlos Pacheco can be seen on the roof of the monitoring building. Modern instruments for ozone and PM_{10} and $PM_{2.5}$ measurement as well as for meteorological parameters are installed there. In pic 4 the Civil Engineering Building of the Universidad del Norte hosting the Environmental Engineering section is shown. In pic 5 the Environmental lab can be seen.

On the only free Sunday during this intensive week Carlos and me participated in an excursion to a mountain park with hiking and bathing in a little river. In pic 6 the group of „Caminantes Senderos del Caribe Barranquilla“ which we joined is shown on their way through the tropic jungle. I want to thank Carlos Pacheco for the invitation and hosting me. It was a challenging full week. But the students survived and enjoyed the course and wrote afterwards an exam and a report on the practical part. I wish Carlos good success in the former establishment of the course! We agreed for a further cooperation including research on air pollution problems.

Prof. Günter Baumbach



Pic 1a



Pic 1b



Pic 2



Pic 3



Pic 4



Pic 5



Pic 6

KEEPING ALIVE THE WASTE SPIRIT:

Meeting WASTE Friends abroad!

One of the best things in having studied WASTE is that you will always meet again with good old friends, wherever you go around the globe! And if you want to increase that chance, there is one corner of the world where this can happen: Latin America! This was my case in the past two months, when I was posted first in Colombia and then in Peru for some long-term project work. The first posting was in Medellín, Colombia, where I met after a long time (almost two years) with my really good friend Natalia! In fact the moment we both learnt the news about my trip, we couldn't believe it that we would meet again after such a long time, and most of all in her home-town Medellín! All the memories of the incredible time we had in Stuttgart (both in Generation 2012) just came up again! But it was not just the two of us: it was a happy coincidence that the time I was supposed to be in Medellín (February 2017) two other good friends and old WASTE classmates, Daniela and Maurice, had already arranged to visit Natalia! So the WASTE reunion ended up to be even bigger! Natalia and her husband José have been super hosts for all three of us and took us around to show us Medellín and all the beautiful places that are to visit around like El Peñón de Guatapé and a super trip to a coffee farm, where we got a first-hand experience of how coffee is cultivated and produced! We definitely enjoyed it a lot and many thanks for that Nati and José!!

In March it was time for me to move on to my next project in Lima, Peru. Maurice had already invited me to visit Santiago, Chile where he currently lives and works together with two other good WASTE buddies: Sebastian and Catalina. Of course I couldn't miss that chance, my first time I made it so close to everyone, so I took advantage of the first long weekend that I could get away from

work and visited Santiago on the weekend of the 1st of May to meet up with my good old buddies from WASTE! Catalina, Sebas and Maurice took me around to the city of Santiago and we also did a short one-day trip to Valparaiso and Viña del Mar, I really loved it and one thing I will always miss is the incredible fresh and abundant sea food you can find in this country!

**Cheers to all WASTE buddies
from Generation 2012!**

Thank you guys for the hospitality and for the great time we had together! I hope that in the future more and more of these chances come up and that we always keep in touch with everyone, no matter how far we are! After all, it's all about keeping the WASTE spirit alive!

**Panos Oikonomopoulos
M.Sc. WASTE alumnus, generation 2016**



WASTE CLUB DESCRIPTION:

Be a part of the Professional Network!

WASTE Club is a non profit association founded in 2006 with 85 members. It unites students, alumni, teaching staff, employees and external companies and institutions. It supports international Master Program "Air Quality Control, Solid Waste and Waste Water Process Engineering" (WASTE) to build a network of individuals with different culture and to cultivate public relationship. It serves as a platform to promote science, research and innovation in the field of topic of the program. It also extends support to excursions and events organized by the department of WASTE.



M.Sc. Air Quality Control,
Solid Waste and Waste Water
Process Engineering

WASTE

Individuals or juristic persons can apply for the membership as a full member with voting right in the general meeting. It is also possible to be a sustaining member. The WASTE club Chairman, Dr.-Ing. Ulrich Vogt encourages each student of WASTE to utilize the benefits of the club fruitfully and to showcase their talents using this open platform. It is a privilege to be a part of the association and to actively participate in achieving its goals. As it is rightly said "The More the Merrier", the WASTE Club by the end of 2016 comprised of 451 members.

The WASTE Club is growing to reach its heights and the support from students, alumni and each member of WASTE Club is counted. Let us join our talents and cultures together to fulfil the objectives of WASTE Club.

**Rashmy Rao
M.Sc. WASTE student, generation 2016**

WHERE TO GO IN EUROPE?: Travel to Egypt

Egypt, or as the Egyptians call it, "The mother of the world" (Um Eldonya), is well-known by its ancient history and monuments spread across the country, perhaps this is not enough to describe Egyptians and their land. Egypt is a country always remembered by the desert landscape predominant in the country and the river Nile, the most extensive river in the world that passes through Egypt and was a key factor for civilization development in Egypt during ancient times. The country counts with around 90 million inhabitants, having Arabic as an official language and curiously its currency is also called "pounds", Egyptian pounds also known in Egypt as "Geneh".

My journey in Egypt started in Cairo, a huge city and the capital of Egypt. The best way to go around Cairo is to get a metro or get a ride from available taxi apps, once the city is huge and the public transportation does not cover the entire city. Cairo is a quite interesting city, one can see people in the streets late at night, chatting with friends and family in cafe's and smoking Shisha (narguile), which is a common practice in Cairo.

For those who enjoy staying up late Cairo is one of the non-sleeping cities in the world. In addition, Cairo has a beautiful bridge "Kasr El Nile" and some good places to enjoy the night life in the downtown area. The capital of Egypt has the most important museum in the country, the Cairo Museum, founded in 1858 with its impressive more than 120.000 Egyptians antiquities; it counts with extensive exposition of mummies, artifacts, sculptures and many other objects.

A visit to the museum requires a long time, since there are many areas to see, so I ended up going twice to check a room with mummies, where some of the kings and queens of ancient Egypt as Hatshepsut and Ramses II are kept. The tickets to visit the museum are available at the entrance. The Cairo Citadel is certainly a place to go while visiting Cairo, the citadel draws attention to its history since it is a medieval building dating from around 1176, the citadel also counts with the citadel's prison museum and the Mosque of Muhammad Ali, which is a piece of art and surely worth a visit. The tickets for visiting the museum and the citadel can be purchased at the entrance. Among all places the Giza Pyramids is something really impressive to see as an engineer, how ancient Egyptians were skilled and had incredible knowledge of math, geometry and many other fields of study to build such big pyramids, for instance the Pyramid of Cheops, until nowadays nobody can explain exactly how they did it.

The Giza pyramid complex, located in Giza on the outskirts of Cairo is composed of six pyramids, cemeteries, underground tombs, a worker's village and a huge sculpture of the Great Sphinx. The place is situated in the desert and surely worth a visit that on average takes half of a day. For those interested in temples and tombs a unique place to visit is Luxor in upper Egypt, there are many temples and constructions. Around there, it is possible to visit the Valley of Kings and Queens which is a complex of tombs built to bury Queens and Kings of ancient Egypt, it lies in the desert about thirty minutes away from Luxor on the west bank of the Nile.

>> **Continues**



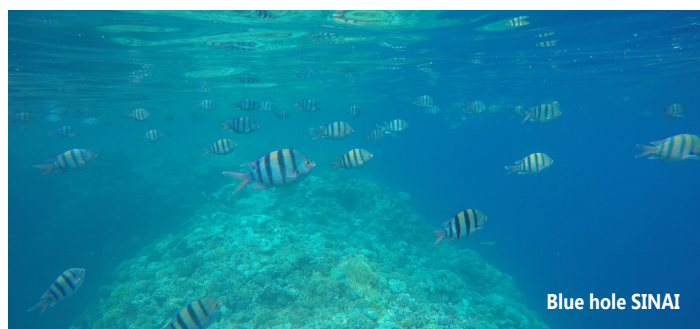
Dahab SINAI



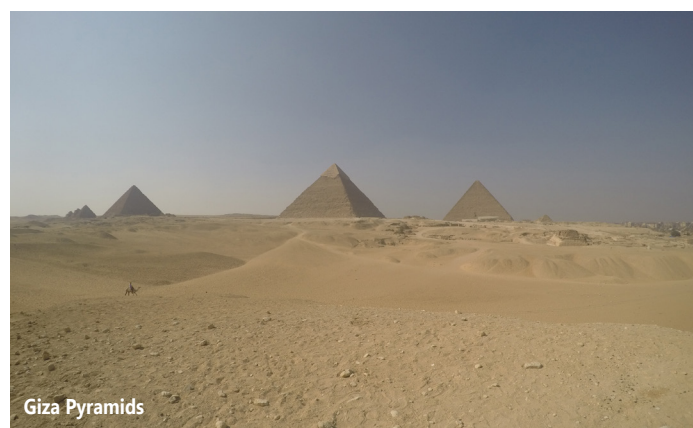
Mosque Muhammed Ali

>> WHERE TO GO IN EUROPE?: Travel to Egypt

The beaches in Egypt are also another attractive point; moreover in places like Sinai it is possible to have desert areas with mountains full of granite and peaceful beaches with astonishing reefs and all marine life within one's reach. One example of this exuberant environment is the "blue hole" in south of Sinai, Dahab, it consists of a hole in the red sea around ninety meters deep. It is possible to do diving and snorkeling in the area, there are also many restaurants around the "blue hole". Sinai is surely a nice environment to enjoy the nature of the region, there are plenty of beaches, islands and activities such as guided tours to oasis in the desert. Another characteristic point of the Egyptian culture is the food. As a seafood lover myself, I would recommend a visit to Alexandria to best enjoy the culinary options of Egypt. I suggest Alexandria for its seafood, fresh and prepared in the local way using spices that make the seafood tastes unique, it is nearly possible to fulfill all expectations regarding seafood since the variety is huge and the costumer himself choose his seafood. In Alexandria (old capital of Egypt) there are also beautiful beaches in the north coast, while the city highlights are for the Citadel of Qaitbay and the library of the city, one of the most historically important libraries.



Blue hole SINAI



Giza Pyramids

Citadel of Qaitbay is a fortress from the fifteenth century and has the sea surrounding it by three sides, which provides a breathtaking view of both Alexandria and the Mediterranean Sea. The library is also a worth visit due to its architecture and to the museums and exhibitions presents on it. There are four museums, the Antiquities museum, History of Science museum, Sadat museum and the Manuscripts museum. Apart from it, the library has a planetarium and many other activities and expositions are always happening there. Traveling to Egypt is certainly a life change experience, there is an unexplainable atmosphere of communion and mystery. Egyptians are generally happy and friendly people and this approach led to good experiences, somehow renovating. There are plenty of places to visit, good food, amazing nature and total culture immersion in the so called by the Egyptians "Um Eldonya" (The mother of the world).

Francine Lima de Souza
M.Sc. WASTE student, generation 2016

FUN WITH WASTE: CHEMICAL ELEMENT WORD SEARCH

V	A	N	A	D	I	U	M	B	S	T	U	W	T	P
U	R	A	N	I	U	M	R	A	D	I	U	M	U	A
Z	T	H	O	R	I	U	M	R	J	T	U	H	N	L
I	R	C	J	G	O	L	D	I	R	A	T	E	G	L
R	U	A	C	T	I	N	I	U	M	N	C	L	S	A
C	T	D	D	I	R	I	K	M	J	I	A	I	T	D
O	L	M	L	O	Y	T	I	N	Y	U	B	U	E	I
N	E	I	R	K	N	X	F	F	R	M	O	M	N	U
I	A	U	T	N	G	N	E	P	T	U	N	I	U	M
U	D	M	O	H	R	R	T	N	E	Q	T	H	R	N
M	K	G	M	Z	I	N	C	N	O	X	Y	G	E	N
H	R	S	O	D	I	U	M	W	O	N	N	O	T	I
A	G	O	S	M	I	U	M	J	M	R	N	O	K	P
A	Y	G	T	N	I	V	A	N	A	D	I	U	M	L

Search (Horizontal, Vertical, Diagonal) 25 chemical elements present in the periodic table!

PERIODIC TABLE OF THE ELEMENTS

Rashmy Rao
M.Sc. WASTE student, generation 2016

CULTURAL AGENDA STUTTGART



www.cannstatter-volksfest.de

The most popular traditional fest in Stuttgart, with a lot of fun, typical food and drinks, music, parks and a lot of good energy to get to get into the southwest Germany culture!

Cannstatter Volksfest

www.cannstatter-volksfest.de

22.09.2017 – 08.10.2017

Timetable: see website

Free of charge

Location: Cannstatter Wasen

2



For the whole month of August, FREE ENTRANCE on the museum on the days that the temperature is above 25 °C

Hitze Frei Landesmuseum Stuttgart

www.landeshmuseum-stuttgart.de

August 2017



www.staatsgalerie.de

Exhibition of American Graphic Art during the period of 1960 and 1990, known for a wide variety of printmaking techniques used specially for advertisement of industrial production. Artists as Andy Warhol, Barnett Newman, Robert Motherwell and Roy Lichtenstein are some of the famous names for this kind of work.

The Great Graphic Boom

www.staatsgalerie.de

14.07.2017 – 05.11.2017

Price: € 12,00 Adults /€ 10 Students



The performing group "Familia Swevia" and "Die Reiseszen e.V." will present during this whole weekend the daily routine of a 13th century life, with all respective costumes, activities, jobs and a huge immersion on the middle age days.

Mittelalter.Leben

09.09.2017 – 10.09.2017

Sa: 1:00 PM – 7:00 PM, So: 10:00 AM – 6:00 PM

Free of charge

Location: Schloss Waldenbuch – Museum der Alltagskultur

Paula Daolio Silveira

M.Sc. WASTE student, generation 2016



NEWSLETTER

SUMMER SEMESTER 2017 - ISSUE 18

M.Sc. WASTE Generation 2016

Newsletter of the International Study Program WASTE and the WASTE Club Stuttgart e.V.

International M.Sc. program „Air Quality Control, Solid Waste and Waste Water Process Engineering“ (WASTE)

PUBLISHER

Dr.-Ing. Ulrich Vogt

CONCEPT

Dr.-Ing. Michael Waldbauer, Keng Been Ang,
Christine dos Santos Costa
M.Sc. WASTE Student Task Force 2006 and 2007

DESIGN AND PRODUCTION

Dr.-Ing. Carolina Acuña Caro, Sofía Engelmeier,
Ing. Nelson Rincón Soto

ASSOCIATE DEAN FOR GRADUATE STUDIES

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