



# NEWSLETTER

## CORONAVIRUS PANDEMIC: A RETROSPECTIVE OF THE DIGITAL SUMMER 2020

In the beginning of this year we received, through the news, some vague ideas about what was happening in China during December 2019. On January 27, 2020 the first case in Germany was confirmed near Munich, Bavaria. Currently the ongoing worldwide pandemic has spread to at least 177 countries, killing more than 610,200 and sickening more than 14.7 million in a matter of months [source: New York Times Aug. 6, 2020].

Within this new context and after a confusing period trying to organize the last examinations of winter term 2019/20 as well as the coming summer term, the middle of March saw our university decided to implement home office for its employees and to ban the entrance of the students to the campuses. The main focus was directed at avoiding the further spread of the SARS-CoV-2. To stay at home was the main message of the German government during the following days, which, in the end, became months. Therefore, the university announced a fully online summer 2020 term starting with this measure a new challenge presented itself for the University of Stuttgart: digital teaching. Although our university already utilized some platforms to share important material for the lectures and to assist the communication between lecturers and students, e.g. ILIAS, this situation brought a new challenge for both sides. On one hand the lecturers had to put in practice their creativity to offer attractive online lectures, while, on the other, students had to organize their daily schedules and attend the lectures from their dorms/home. Unfortunately, the management of the summer term under the given conditions was not that "easy" for everybody.

Some of our international students got stuck in their home countries being unable to come back to Germany even for the period of on-site examinations. Many master thesis and student research projects were delayed until further notice.

Accordingly, corona-guidelines for study programs of the University of Stuttgart and the corona-ordinance from the Federal State Government of Baden-Württemberg were released and must be considered for each of the cases. Moreover, a very dynamic, informative situation occurred when the university started to publish updated information almost daily through their "Newsticker: Information on the coronavirus" page (<https://www.uni-stuttgart.de/en/university/news/corona/>). Up to date this link is still very important to follow the latest news regarding the hygiene concept, examination rules, enrollment, travel warnings, and framework of conditions for teaching in the coming winter semester 2020/21, among others.

Since the pandemic is still an ongoing issue worldwide, we must continue taking care of ourselves but also of our neighbor. Hopefully, during this time after the confinement we realized just how important social contact is, to meet friends, to breathe fresh air, to attend a lecture, to interact with professors and colleagues, and consequently try to appreciate every moment together. Let's hope for better times!

**Dr.-Ing. Carolina Acuña Caro**  
Course Director M.Sc. WASTE



### News-Ticker: Aktuelle Informationen zum Coronavirus

Die Universitätsleitung informiert Beschäftigte, Studierende und Studienbewerber\*innen laufend über aktuelle Entwicklungen zum Coronavirus. Hinweise zu Prüfungen, Studium, digitale Lehre, Einschreibung, Arbeitsorganisation und Kinderbetreuung.

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# DURING COVID-19: ONLINE LECTURES

With the spread of the novel coronavirus in early 2020 and the resulting need to maintain social distancing, holding online lectures on virtual platforms has become essential. Universities across the globe quickly evolved to create digital platforms to ensure uninterrupted learning for their isolated students. At the University of Stuttgart, students use an online platform called WebEx to attend online meetings and lectures. An interview was conducted to understand the students' and the professors' feedback with regards to the online lectures and their pros and cons.

Dr.-Ing. Klaus Fischer is a visiting lecturer for the M.Sc. WASTE program and, up until three years ago, was a member of ISWA (Institute for Sanitary Engineering, Water Quality and Solid Waste Management) and a former division manager SIA.

He has been conducting lectures for the WASTE program since it began and has been teaching sanitary engineering and mechanical and biological treatment of waste. He was the perfect candidate for the interview as he has been a lifelong contributor to the WASTE program.

When asked about his experience with the change to virtual platforms he said that it was relatively easy for him as he is constantly involved in consulting and doing online meetings. Setting up online lectures was also simplified as he had his own camera and could make videos easily. In addition, he had to make some changes to his compendium to be able to send them chapter by chapter to the students.

One major change he made was giving a lot of exercises after each chapter. His objective for doing this, he said, is that the students not only read the compendium but also think about the content and read further literature about it. However, he does not find online meetings to be advantageous as they are more time consuming for the professors to prepare additional lectures and grade more exercises now compared to the past. He commented that he has been waiting desperately for the vaccination to arrive so that life could go back to normal.

What professor Fischer really misses is the personal interactions with the students: the questions they ask and the reactions that he gets when he is giving a live lecture. Due to the online meetings, he does not have much contact with the students, and he misses interacting with them. While doing a WebEx meeting he said "you can see only see a small picture and each person has a very small space" and he says he cannot "see the students smiling, laughing, or being tired". He remarked that even if the online format of lectures is helpful, it is still very distant from the actual classroom environment. He values the personal contact with people and finds that to be beneficial for forming a strong relationship. On the students' side, however, some interesting feedback was received. One of the students from Generation 2019, Zhaolin Xu, said he prefers the online lectures more compared to the physical ones. He likes this kind of teaching methodology as he found it easy to adapt to. For example, he said that he could record the videos during the lectures and replay the video as many times as he wants if he has difficulty in understanding something. He observed that studying online saves him a lot of time because he does not need to go to the classrooms, which are quite far away from his dorm.

Nevertheless, he reflected that the virtual lecture really requires self-discipline. He said it is easy to be distracted when you have a meeting virtually and that it also requires more time management skills. After the reopening of the quarantine, he opined that the virtual lecture can still be a good supplement, even if we are allowed to have normal lectures.

This switch to online teaching is something that is unprecedented for both the students and professors, but we all are embracing it as a consequence of the pandemic. While in person teaching will eventually return to campus, the crisis provides an opportunity to bring more technology to the classroom. The use of digital tools and modernizing the way courses are instructed can potentially allow students to choose how they learn best.

Pawan Bhojar,  
M.Sc Waste Student Gen 2019



Image by Grecia Carolina Solis Castillo

# FAREWELL NELSON

"For the ones who do not know me yet, I am the one from the e-mails" – a classic Nelson opening statement (original, by the way). This is how I started 90% of the events I organized during my M.Sc. WASTE journey. As with every worthy journey, the end must eventually come. Today I have the chance to say goodbye and thank everybody who made this a once-in-a-lifetime experience for me. I am officially leaving the M.Sc. WASTE Office on the 9th June, 2020, but always feel free to contact me from anywhere in the world: nfrincons94@gmail.com

I started as a slightly annoying, over-curious applicant who, after a few speeches and parties, became Class Speaker and ended up as Course Manager. It has been almost four years of complete devotion to the program where I had not only the chance to join academic commissions but also take on new challenges such as the International Symposia, the re-marketing of M.Sc. WASTE, and the application to the EPOS-DAAD Program.

The recently launched M.Sc. WASTE website is the glazed cherry on top to the end of my work at WASTE. This website is not only the outcome of a 2-month project, but a beautiful reminder of my whole M.Sc. WASTE journey. It is my pleasure to be able to thank the program for the opportunity to become a better professional, person and, of course, graphic designer/party planner/socializer/cook. Feel free to check it out at : [www.waste.uni-stuttgart.de](http://www.waste.uni-stuttgart.de)

Of course, the Journey would not have been the same without the unconditional support of Dr.-Ing. Acuña Caro. If there is anyone who cares most about this program, it is definitely her. She has always been a clear example of commitment, professionalism, and trustworthiness for me. I could not be happier that M.Sc. WASTE is under her lead. Some more quick acknowledgements:

To Ms. Grecia Solis, my fellow class speaker, I will miss you too dear! Nobody smiles more than you do, even in rough times.

To Dr.-Ing. Ulrich Vogt, who has been there for me throughout the entire time and has always provided valuable input, which was such a guidance for me!  
To the M.Sc. WASTE Office HiWis: You guys know how much work the program demands. I am glad you were all there and I highly appreciate all the work you put towards the program.

To all professors of the program: Thank you for your teachings and for making the program unique and academically outstanding.

To Generation 2017: My babies. It was an honor being your godfather during your graduation and I hope I eased up things for you over the last years. Rain-bow-hugs for you all!

To Generation 2018: With you guys I shared most of my time here... I feel close to most of you and I promise I will attend/cook something for your graduation! I hope you have enjoyed this almost 2-years in Germany and that being part of WASTE has to do with that.

To Generation 2019: My youngest. We were just barely getting to know each other, but I will always remember you guys as a very positive generation. Your guys have a bright future ahead, never lose the spark and stay motivated and happy, as you always are!

Looking back at this ride, I am satisfied with all I have done for the program and grateful for the opportunity to get to know each one of you. At the end, I do agree with Google's advice for a farewell message: People make the journey. I will miss you all (dramatic music).

Best regards,

Nelson Felipe Rincón Soto, M.Sc.  
Course Manager (For a last time)



M.Sc. WASTE III International Symposium - Student speakers- Photo by Jeremiah Backman

# SUSTAINABLE WEEKS

The Sustainability Weeks @ Universities BaWü 2020 was conducted from May 11th-26th. Numerous student university groups, environmental departments, and sustainability departments from seven universities in Baden-Württemberg came together to organize a diverse, interdisciplinary program comprising 50 digital events. The students participated from the following universities: the University of Stuttgart, University of Hohenheim, PH Ludwigsburg, University of Aalen, University of Mannheim, University of Media and Baden-Württemberg Cooperative State University.

As a part of this, students from M.Sc. WASTE Generation 2019 conducted the Sustainable practices for students and 'green' technologies.

Be the change you want to see in the world- Mahatma Gandhi

The first two presenters emphasized that each individual's small efforts can lead to an enormous impact. Firstly, Rohit Sheoran's presentation was about the significance of sustainability in everything and how everyone is interconnected. Sustainability is the capacity to endure economically, environmentally, and socially. I believe that sustainability is also about living our values and acting with integrity, responsibility, and generosity. He furnished tips on how to lead a sustainable lifestyle.

*781 liters are required to produce a pair of jeans which is equivalent to 33,4 kg carbon equivalent.*

Nery Condori demonstrated the implementation of recycling in three different types of predominantly student residential places in Pfaffenhof I and II dormitory on the University of Stuttgart campus in Vaihingen, where initially only the sorting of glass and paper was carried out. The main aim of this project was the introduction of the Gelber Sack in the dorms; who's absence led to the disposal of valuable materials into residual waste (Restmüll), which would be finally incinerated. Labeled bins and the provision of special bins to private apartments have eased the recycling among students. The project also looks into the segregation of e-waste and biowaste.

Following this part, Camilo Lancheros talked about the role of university shareholders in setting up centralized bodies, called „Green Office“. He mentioned the vision, goals, and sustainability efforts (STUVUS) of our University and also about the vision and mission of a green office concept, founded in 2009. It is currently at 47 places in Europe, Africa, and Central America. He also provided case studies of successful green offices in Universität Konstanz, Vrije Universiteit Amsterdam, and Vrije Universiteit Brussels.

Then Zuemmy Nevarez presented about bio-construction, its origin, materials, techniques, advantages, disadvantages, and the challenge of combining architectural knowledge with local practices. I believe that if we could overcome this challenge, it would lead to sustainable, environmentally friendly, and cool buildings. She also gave invigorating examples of existing bioconstructions such as 2400-year-old refrigeration systems called yak shells, which the Persians use to preserve their foods -Imagine cold beers in deserts- and, in Germany, the commonly found Fachwerkhäuser architecture, built from wood, mud, straw.

It was surprising to know that 3781 litres of water are required to produce a pair of jeans (from the production of cotton to its delivery to stores), which is equivalent to 33.4 kg of carbon equivalents. Can you imagine the environmental costs for everything in our wardrobe? Pawan Bhojar provided eye-opening facts about the carbon equivalent emissions due to the fashion industry and packaging wastes in developed countries such as the USA and Germany, respectively. He also emphasized the need to change our views on our trash by suggesting going to one of the largest flea markets that take place every Saturday in Karlsplatz, Stuttgart.

*If the CO2 emissions continue at the present rate of 1331 Ton/s then our planet Earth will have only 25 years left.*

The most environmentally friendly product is the one we don't buy and this made me think a lot.

A carbon budget aims to create negative emissions, that is, the fossil fuels or biomass put into any system to generate heat or electricity should be less than what it is when leaving it. "Carbon Capture and Storage" was proposed by Christopher Onyia as a solution to meet this carbon budget. He also talked about the aims and goals of the Paris Agreement in 2015. If the CO<sub>2</sub> emissions continue at the present rate of 1331 tonnes per second with a temperature rise of 2 °C rise per year scenario, then our planet Earth will have only 25 years left.

Continues >>

# SUSTAINABLE WEEKS



Image: Zuemmy Nevarez presenting examples of bio-construction.

Food production accounts for 20-30% of all anthropogenic greenhouse gas emissions and about 70% of all human water usage. It was disheartening to know that agricultural production of food, fiber, fuel accounted for 90% NH<sub>3</sub> emissions and 50-80% Nitrogen load in freshwater bodies impacting water quality. Finally, Edgar Molina and Stefany Chamorro addressed these issues on nutrition and its sustainability, with their talks on 'Veganism as a path towards sustainability' and 'Growing your food', respectively.

A vegan is someone who abstains from using or consuming animal products such as leather, eggs, and meat. I do agree with Einstein's concept: Nothing will benefit health and increase the chances for survival in life on Earth as the evolution of a vegan diet. Edgar's talks made me reconsider my dietary choices, however, it will take a few more years for this gradual evolution to occur in my life. Meat and dairy products contribute more than 4 kg CO<sub>2</sub> equivalent/kg while local fruits, vegetables, and cereals are less than 1 kg CO<sub>2</sub>/kg. Edgar emphasized the high levels of water consumption, emissions (CH<sub>4</sub>, NO<sub>x</sub>, and NH<sub>4</sub>) from livestock, and how dead zones caused by blood from slaughterhouses can lead to eutrophication because of their high organic content. He explained how 50% of antibiotics produced in the US per year are used on animals to improve meat production, which is later leached from urine, thereby contaminating ground-water and surface water.

Stefany emphasized that food choices could have an enormous impact on the agriculture sector. When we grow our food organically, food security (securely) with less privileged people and a more resilient city are enabled. Wondering what to do if there's no balcony or garden at your place? You could join these gardening projects in Stuttgart: Grün Anteil, Anstiftung. Importantly, we have community gardens on our University campus. So, you could go out there and check if you have green fingers. I loved her personal experience in raising her kids (her plants) in her room and roof. Plants such as cabbage, celery, carrot, lettuce, scallions are easy veggies to start getting dirt in your hands.

"It was a revelation to me, all that valuable knowledge gathered along centuries being used in a way that we can be thankful to the planet while living comfortably at the same time." is what Zuemmy felt when asked about her experience in preparing for this online event. These eight topics are student-centered and focused on how students can be proactive in dealing with sustainability-related issues.

Meenakshi Samidurai  
M.Sc. WASTE Student, Gen. 2019



# WELCOMING THE NEW GENERATION 2020

## Interview with the students of Generation 2020

As the summer semester is finishing soon, we welcome the students of Generation 2020 to begin their Master's program for the coming winter semester. Hence, we interviewed two of the students from Generation 2020 to know their plans and expectations from this program.

**Julie Ferreux**



**M.Sc. WASTE student Generation 2020**  
Nationality / Country: French / Swiss

**Marvin Meyer**



**M.Sc. WASTE student Generation 2020**  
Nationality / Country: German / Germany

### 1) How are you coping up with the admission and VISA procedures to arrive at the university in the current pandemic situation?

**Julie:** As I am living in Switzerland and have a European passport, I am mostly observing the political situation between Switzerland and Germany regarding the opening of the borders. Right now it looks good and I hope they will not have to close the borders again.

**Marvin:** As a German resident I am really lucky that I don't need to deal with the admission and VISA procedures.

### 2) Why did you choose Germany for conducting your postgraduation and finally decide to study M.Sc. WASTE program?

**Julie:** I did my bachelor in Innsbruck, Austria and I was able to do an internship at the University of Innsbruck in the Unit of Environmental Engineering, specifically in bio waste. I really got fascinated about this subject that I wanted to do my Master's about waste. PhD student from the University of Innsbruck told me about this program in Stuttgart and explained that it is offered in German as well as in English. I did some research, contacted different people, which led me more and more to the decision that I wanted to apply to the M.Sc. WASTE program – and here I am :)

**Marvin:** Before I decided to do postgraduate studies I gave myself a little break from studying and started to work. After a period of two years I reached this point where I felt confident that this master program will be an important and wise step for my future. The worldwide challenge of the right handling of waste is fascinating to me. Therefore the connection between the comprehension of waste treatment and the multicultural background of this program are the determining factors of why I chose to come to Stuttgart.

### 3) What academic skills are you expecting to gain by attending this course?

**Julie:** I am expecting to gain different kind of skills. I would like to improve my scientific English, so that I am able to work with people all over the world without having a language barrier. I am also expecting to gain confidence in myself, working in an engineering environment. I count on learning so much about waste management and process engineering, so that I will not have any trouble finding my dream job. And last, but not really an academic skill, I am hoping to meet great people from all over the globe.

**Marvin:** I want to specialize in the field of solid waste and waste water process engineering as well as connecting this knowledge with my comprehension of environmental processes which I gained during my bachelor studies. Also a big interest is to gain an extensive overview of the diverse handling of waste which all my colleagues will present due to their experiences in their home countries. Furthermore, I hope my English and maybe even my Spanish skills will develop and strengthen. Between the comprehension of waste treatment and the multicultural background of this program are the determining factors why I chose to come to Stuttgart.

**Continues >>**

# WELCOMING THE NEW GENERATION 2020

## 4) How do you imagine your life during the time you will be pursuing M.Sc. WASTE program?

**Julie:** Right now, because of the pandemic, everything is written in the stars. Will the classes be held online or offline? Will it start in November 2020? Will everyone be able to attend the classes? It is so uncertain that I do not try to think too much about it. However, I like to imagine that Generation 2020 will be a group with great team work spirit and lots of friendships being built with students from all over the world.

**Marvin:** I'm looking forward to a period of multicultural experiences and making new friendships from all over the world in Stuttgart. Due to several conversations with students from the University, I have no doubt that the content of the program is going to give us very good opportunities to find an excellent job in this field afterwards. It would be sad if the pandemic situation forbids classes in the lab and the gathering with new students. I don't mind several online classes but I wish to meet people physically in the first place before I feel comfortable working with them online. So I do hope everybody will be able to arrive in Germany in time and the program will be able to start as planned within normal procedures.

## 5) What are your future professional plans once you finish this Master's program?

**Julie:** I would like to start with a job in a company that has different types of waste management projects all around the world, where I could turn the theoretical knowledge from the Master's program into practice. I as well like the idea of leading those projects and maybe one day become self-employed?

**Marvin:** I haven't made a decision yet, but I see so many opportunities for my career. This program gives the possibility to solve problems in the field, to present the persons in charge where the difficulties lie, and takes the cultural differences into account. I will gain all required conditions to help within worldwide aid projects. I plan to begin with such kind of work experience and then see how this will work out for me. But as my family lives here in Germany I can imagine that in the long term I will search for national jobs e.g. in the private sector of landfill construction. However, as I like to develop the general waste situation and do like the work in the lab, I also see myself in universities or similar jobs.

Sindhu Shankar  
M.Sc. WASTE Student, Gen. 2019

## Symposium 2020: Challenges and opportunities in the organization

Covid-19 crisis has changed the way we interact with each other. Currently lectures are done digitally with the WebEx platform. All site visits – typical events for the program – that were planned for this semester have been cancel. Thanks to the effort of the WASTE Office, however, events planned at the beginning of the year like WIMs and the annual Symposium 2020 will still take place, but this time digitally. The organization team for the annual Symposium in November has started to work with new challenges in order to cover all the features that the past Symposiums have had.

The inability to conduct face-to-face networking with expositors and difficulties around student research project poster presentations are just a few of the challenges being overcome. The current situation does not only bring problems, but also provides the opportunities to get in touch with expositors from different parts of the world, and to reach a larger number of ex-alumni that can be part of this online event.

We have interviewed Gabriela Laperche, one of the members of the Symposium organization team, who will give us more detailed information about how the event will develop this year.

[Continues >>](#)



# SYMPOSIUM 2020

## What is the approach to this year's Symposium?

The Symposium will focus on the transition to a sustainable future, which includes topics like circular economy, energy, and smart cities. These topics are closely related to the three specializations that the master's program covers (air quality, solid waste, and wastewater).

## What are the challenges of planning an online Symposium?

I think that, with the current situation, the most challenging thing is finding the best online platform to hold the event. We need one which allows us to have the student poster presentations and which also facilitates optimal interaction between assistants and speakers.

## How are you planning to introduce the students' poster presentations?

The platform should have the feature to arrange breakout rooms for different student poster presentations. Participants can enter the room of interest during the period of a 15-minute break between the international speaker presentations. Due to the fact that the symposium is going to be held in two days, we will have more breaks than in past symposiums, giving the participants and students the opportunity to share ideas and discuss the project, aims, and future developments.

## How will you draw the attention of students to participate in the Symposium?

The advantage of organizing an online symposium is that it will give us the chance to invite more international speakers than usual. We will offer an attractive variety of experts in the field who can talk about the different experiences in their countries. This will call the attention of the students to participate more actively.

## Finally, what can the students of the waste program expect from this Symposium?

Along with the classic opportunities that the Symposium offers to participants, this time it will provide a further connection to ex-alumni than usual. The ability to travel to Stuttgart has, in the past, hindered many from attending, but this year distance knows no bounds. Students can expand their network and ask the ex-alumni about their experiences in different industries.

Organizing a virtual event also reduces certain concerns, like finding a place, defining the date, booking the guest accommodation, and catering. Participants, as well as speakers, can attend from their homes as long as they have an internet connection. On this occasion, the organizing committee has the chance to overcome challenges but also to demonstrate their adaptability and take advantage of the new circumstances. This Symposium will establish a precedent in the way that students, researchers, and industry representatives can effectively cooperate.

Nery Condori and Cinthya Lara  
M.Sc. WASTE Students, Gen. 2019



image: M.Sc. WASTE III International Symposium - Photo by Jeramiah Backman

# INTERVIEW EPOS-DAAD SCHOLARS WS 20/21

Since the winter semester 2020/2021, the M.Sc. WASTE program has had the honor to include six scholars who will conduct their studies with us. The M.Sc. WASTE is now part of the EPOS-DAAD program that supports selected candidates from developing countries to study international and competitive degrees in Germany. I had the opportunity to interview three scholars, Macdonald Nwamuo (MN) from Nigeria, Carlos Lomeli (CL) from Mexico and Masoumeh Mirzaei (MM) from Afghanistan and ask them about their path to get this scholarship and their expectation for the upcoming two-years-challenge.

## Carlos Lomeli



photo of Carlos Lomeli

M.Sc. WASTE student Gen. 2020  
Nationality / Country: Mexican / Mexico

### What was your motivation to choose Germany for conducting your Master's studies? How did you learn about the EPOS-DAAD Scholarship program?

**MN:** I was motivated by my love for Germany's educational development in engineering, science and environmental management. Therefore, in order to develop my career in the field of waste management, I opted for Germany where I will receive the best in terms of learning and research. In my quest for the best place to do my M.Sc. program and the availability of scholarships, a friend introduced me to the EPOS-DAAD scholarship program.

**CL:** For a long time I have had an interest in Germany mainly due to the culture and the fact that it is a highly developed country. In high school, some exchange students introduced me to the language and then I learned it during my undergraduate studies. Subsequently I knew, thanks to a DAAD conference, about the opportunity of master studies in Germany and just with some research of German Master programs I bumped with the WASTE program and the EPOS-DAAD scholarship.

**MM:** I want to study in Germany firstly to learn from Germany how to reconstruct and rehabilitate cities, infrastructures, sewage system and roads specifically after World War II. I feel there is a lot to learn from German professors and professionals. Secondly, Germany has taken a key role in the reconstruc-

tion of Afghanistan after the fall of Taliban regime. It has invested in different sectors focusing on good governance, promoting girls and women, sustainable development as well as urban development and municipal infrastructures. By holding a master's degree from Germany, I would be able to professionally and effectively work alongside German partners in Afghanistan. My first introduction to DAAD was when I was studying civil engineering in Kabul, a DAAD representative, was speaking about DAAD scholarships at the university.

### What do you expect of the M.Sc. WASTE program? (From the academic and intercultural Point of view)

**MN:** An M.Sc. WASTE program will broaden my horizon in this field of study and afford me the opportunity of interacting with scholars and experts from Germany and other nationalities. It will give me an opportunity to interrogate issues on waste and examine available literature in the university library.

**CL:** When I decided to study chemical engineering, I wanted to be able to be part of sustainable development. Then, after some years of experience in the chemical industry, I realized I needed to specialize around environmental technologies in order not to only contribute my aim from the beginning of my studies, but also to have the personal experience of living in another country. I expect both to make friends and enjoy the culture from Germany and other countries.

**MM:** When I saw the M.Sc. WASTE program on the EPOS list, it immediately grabbed my attention because it perfectly fits to my educational and career background and it covers my academic and career goals of becoming an environmental expert in the future. It is very specific to the environmental challenges within cities. This Master besides providing me the knowledge on treatment technologies, biology of water, organic and inorganic chemistry, ecology of water and technology assessment, will also help me gain practical skills through industrial internships and research activities to work with Ministries of Health and Water Supply/Sewerage. To be a part of this Master, surrounded by highly qualified and experienced professionals, is a great opportunity that is presented to me. I know that if I utilize this opportunity to my highest potential I will graduate as an experienced and educated expert in my field.

and municipal infrastructures. By holding a master's degree from Germany, I would be able to professionally and effectively work alongside German partners in Afghanistan.

## How do you imagine your life living and studying in Germany?

M.Sc. WASTE student Gen. 2020

Nationality / Country: Afgha / Afghanistan

**MN:** In view of Germany's stable and robust economy and conducive learning environment, I am greatly motivated to focus on my studies and research works without distractions.

### Masoumeh Mirzaei



**CL:** I imagine my next two years in Germany as a roller coaster. On the one hand, I am very excited for the new friendships I will make, the knowledge I will acquire, and the places I will visit. On the other hand, I know it will take time for me to adjust to the new culture (including the weather) and the fact that I will miss my family and friends from Mexico. However, I am confident I will enjoy it the most.

**MM:** I know living in Germany will be challenging and different from my home country. But I have been preparing myself, with learning the German language and studying German Culture, to better equip myself to adapt to the new environment. The German academic domain is rich with globally recognized universities and study programs (e.g. M.Sc. WASTE Program) and all of them are modernly structured and designed to meet up to date scientific developments to train and educate student to confidently face challenges. Studying a Master's course means more than a full-time job. So, I expect a challenging period in Germany, because of my daughter. Studying and being a mother will not be easy at all. It might be also difficult at first to transition to Germany's education system, to get to know the system, and adapt myself with it and get the most out of it in the end. On the other hand, my little daughter will benefit from rich educational system in kindergartens during our stay in Germany. She will learn German as her second language.

## What are your future plans after finishing the M.Sc. WASTE program at University of Stuttgart?

M.Sc. WASTE student Gen. 2020

Nationality / Country: Nigerian / Nigeria

**MN:** At the end of my study, I hope to use the knowledge I will acquire to contribute positively in proper waste management in Nigeria and other developing countries as climate change occasioned by waste and pollution is a major challenge in Africa.

**CL:** I guess I will want first to enjoy some time stress-free from school traveling because I know the M.Sc. WASTE will be a challenge. Then, I would like to acquire some international professional experience in the chemical industry, for which I expect to work in a big German company and apply my recent knowledge from the Master's studies. All the same I would like to bring my experience to Mexico and support sustainable development.

### Macdonald Nwamuo



**MM:** As a process engineer, I will be able to respond to environmental challenges and to contribute to changing current trends which have led to unsustainability and environmental issues in my country. I want to create a cleaner and healthier environment for future generations and specifically for my beloved daughter. Finally, I would like to contribute to educating and capacitating future Afghan engineers through teaching at Kabul University. I want to become a teacher and trainer of environment and engineering. With this scholarship position, the German government will help me achieve my academic goal of teaching at Kabul University, my professional goal of becoming a civil

engineer specialized in environmental projects, and will be a vital and powerful step on my path to becoming a career-driven young Afghan woman.

Grecia Carolina Solis Castillo  
M.Sc. WASTE Course Manager

# MEASUREMENT OF AIR POLLUTANTS

## Climate Change and Your Health - Investigating Plane Emissions at Stuttgart Airport

For my master's thesis, I am studying airplane emissions levels measured along the perimeter of the Stuttgart airport and in the surrounding community. This topic originally began as a group project from the Planning of Measurements class where we were tasked with developing a theoretical measurement plan. Now a year later, after making some adaptations, it has been rewarding to see the project finally being realized.



Image: Set-up of devices during stationary measurements by Kathryn Molina

It is widely known that aircrafts are one of the biggest sources of CO<sub>2</sub> emissions, but not often mentioned are the ultrafine particles (UFPs), NO<sub>x</sub>, SO<sub>x</sub>, particulate matter (PM), CO, and soot, all of which are directly linked to a variety of health concerns and climate change [1]. While an environmentally conscious city like Stuttgart has implemented measures such as Feinstaubalarms, low emission driving zones, and banned diesel cars, it was surprising to learn that little attention has been given to monitoring aviation emissions. According to the Clean Air Plan for the state of Baden-Württemberg, air traffic is considered a lesser contributor to the monitored air pollutants and therefore is not a major focus [2]. On the other hand, the European Union Aviation Safety Agency (EASA) states that aircrafts do influence the air quality in the surrounding area of the airport and farther distances away [3]. Unable to reconcile the differing views on the degree of influence air traffic has on human health and the environment, I was further

inspired and motivated to investigate this topic that seemingly may have been overlooked in the Stuttgart area.

To gain a better understand of the pollutant levels from airplane emissions, this project is comprised of several measurement periods and includes a combination of stationary and mobile measurements. The devices being used measure PM and UFP mass and number concentrations and size distribution, NO<sub>x</sub>, CO<sub>2</sub>, and O<sub>3</sub> concentrations, and wind speed and direction.

Due to Coronavirus, the airport expedited construction that was planned for a later date and was completely closed for two weeks in April. During this time, I was able to do the first round of stationary measurements without any air traffic and gather baseline data at several points along the airport perimeter and in the nearby communities that were directly in-line with the airport runway.

Construction at the airport was completed mid-June, but with many countries just starting to reopen and many people still being hesitant to fly, the number of scheduled flights was low at only thirty per day compared to the normal four-hundred per day [4]. Nevertheless, a second round of measurements was conducted during this period for comparison. Stationary measurements were made at the same points in-line with the runway, but now a few planes were arriving and departing directly overhead.

A third round of measurements, including both mobile and stationary measurements, has been planned between mid-August and early September, the normal travel season in Germany. Though the air traffic may not be completely back to normal by this time, comparing the emissions levels between the different measurement periods will still be indicative of the real impact of air traffic has on pollutant levels.

Kathryn Molina  
M.Sc. WASTE Student, Gen. 2018

[1] European Union Aviation Safety Agency (EASA): Overview of Aviation Sector. Emissions. With assistance of EEA and EUROCONTROL. Available online at <https://www.easa.europa.eu/eaer/topics/overview-aviation-sector>, checked on 6/24/2020.

[2] LUBW Landesanstalt für Umwelt, Messungen und Naturschutz Baden-Württemberg (2013): Luftreinhaltepläne für Baden-Württemberg, updated on 2013, checked on 6/23/2020.

[3] European Union Aviation Safety Agency (EASA): Aviation Environmental Impacts. With assistance of EEA and EUROCONTROL. Available online at <https://www.easa.europa.eu/eaer/topics/aviation-environmental-impacts>, checked on 24.06.20.

[4] Stuttgart Airport: Facts and Figures. Important Data Relating to Flughafen Stuttgart GMBF. Available online at <https://www.stuttgart-airport.com/company-information/facts-and-figures/>, checked on 6/22/2020.

# STUDENT RESEARCH PROJECT EXPERIENCE

As a M.Sc. WASTE student, one has the opportunity to complete a practical project called a student research project. This option is available as 12 ECTS elective module credits. The project must be done in one of the University's institutes with a supervisor for 6 months (either in 2nd or 3rd semester). The topics available to conduct research projects are in huge numbers because the project can be involved in any of the three specialization fields of the master's program. This project can further lead you to do a master's thesis on the same topic which can be an added advantage for completing the program.

Humayra Bushra, our fellow mate from Generation 2019 shares her personal experience on her ongoing student research project.

## Could you tell us the procedures you went through to get this student research project?

I wanted to get a student research project in the first place, so that I would be more comfortable during my thesis. I wanted to also get familiar with working procedure for research work in Germany, which I believe will eventually help me in future. So, I looked at the research work going on in different institutions and started to reach out to corresponding persons soon after we had our meeting on topics of research projects. I was also keeping an eye on job platforms like Stellenwerk, Stonejobs, etc. I found the topic I pursued on Stellenwerk. Immediately I applied for it and soon I was asked to have a small interview with my supervisor. After around 10 days, I received confirmation from him to work with on the project.

## What is the topic for your student research project and which institute are you carrying it out under?

My research project topic is "CO<sub>2</sub> capture in the Waste-to-Energy sector, potential analysis". Mostly it is a hypothetical analysis, which I am doing at Abteilung Kraftwerksfeuerungen (KWF) or Power Plant Firing Department at IFK (Institut für Feuerungs- und Kraftwerkstechnik) or Institute of Combustion and Power Plant Technology.

## Why did you choose this particular topic?

Well, choosing the topic was quite an interesting moment for me. Recently, I was watching a documentary about increasing amount of CO<sub>2</sub> in our atmosphere. This documentary motivated me to work on something that might help reduce the amount. Within a few days, I came across the topic. I studied a bit about the topic in my own personal time and then looked for the work done in this sector. Of course, I found some studies, but for me it was not enough to just read about the work being done, I wanted to dig deeper and work on solving this particular

issue. I wanted to know more and was super enthusiastic about it. During my interview with my supervisor, I expressed my interest and he felt my enthusiasm about the topic and offered me the project. I am hopeful to produce a bit of research that will motivate further work in this field.

## Can you give a brief explanation of your research project?

CO<sub>2</sub> emissions from waste management, whether through thermal waste treatment or landfilling, account for a significant share of total anthropogenic greenhouse gas emissions. One way to reduce this emission is to go for incineration and capture the CO<sub>2</sub> emitted from incineration. It might even be possible to remove CO<sub>2</sub> permanently from atmosphere and store it or use it for chemical production or as fuel. The scope of this project involves conducting a detailed literature research on global carbon dioxide emissions from waste management sector. Subsequently, the potential of CO<sub>2</sub> capture in the waste to-energy sector will be evaluated and calculated using an example of a real waste-to-energy plant.

## How is the working environment at the institute in the current pandemic situation?

As my project is theoretical mostly, I do not need to be at institute all the time. Starting from my interview, we tried our best to keep it remote. I started my work at home when the university was not allowing face to face meetings. In normal situations, I might have to meet my supervisor regularly with updates, but now with the restrictions we are doing that via phonecalls. Even if I have to work at the institute (which happens rarely), we have to maintain social distance or have to wear a mask if there were more than 2 people in the room, and distance cannot be guaranteed. But of course, we try to avoid any unnecessary travel to institute or face to face meetings in current situation.

Sindhu Shankar  
M.Sc. WASTE Student, Gen. 2019

# INTERNSHIP

## IGOR @BOSCH

One of the many great opportunities that comes with studying MSc. WASTE is that of working an internship. My name is Igor Carvalho Ramos (Gen. 2018) and I am currently conducting an internship at Bosch in Abstatt, working in the Health, Safety and Environment department on a project to further develop the sustainability concept in one of Bosch's business units. The manufacturing and development sites of this business unit is represented by over 30 sites spread all across the globe, whereas its headquarters are located in Abstatt. To sum up, we are working to reduce water and energy consumption as well as waste generation of all these sites.



photo of Igor Carvalho Ramos

### Firstly, why would I do an internship and not focus 100% of the time on my studies?

We all have been gaining the so called "hard skills" throughout our entire lives by taking courses, workshops, collecting qualifications, degrees, and certificates, essentially, everything we add to our curriculum.

The "soft skills", however, are often forgotten and they are just as important as the hard skills. They are: communication, teamwork, empathy, team management, confidence, creativity, and so forth. These skills we learn with "hands on" experience and, as I have been seeing, they are way harder to develop as well as being way more in demand in the job market.

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„Once you are connected with a company,  
it will be easier to get an internship “

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### Secondly, what are my personal recommendations when applying for an internship?

First, do not wait to the end of the course. Start looking for positions such as working students (Werkstudent) or HiWis (Hilfswissenschaftler). Once you are connected with a company, it will be easier to get an internship more related to

the topic of your studies. What is more, it is a good way to see if you like this specific topic or not. Believe me, you will not enjoy starting a thesis or a research project on a topic you thought you liked until you really started working on it and realized otherwise.

Then comes the recurring question about the CV and cover letter: English or German? Always go for German, even if your German level is very low. It does not matter how international the company which you are going to work for is, it is always better to speak in the mother tongue.

By applying in German, you show that you are working to improve your language skills and, at some point, this method of communication might happen in German. Besides, many people do not even read applications in English, as I personally was told by a previous employer. So, just make sure to state your level on the CV and ask someone to correct the writing.

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„By applying in German, you show that you are working  
to improve your language skills“

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### Finally, how is my experience at Bosch?

I started the same week as the lockdown in Germany (because of the COVID – 19 pandemic). Luckily, the company has a good tech structure and the communication was therefore smoothly facilitated. It has been two months now working in home office, but I feel like I know most of the department personally. Our department even has a 30 minute per week session reserved as "coffee time", which is for chatting about life with other employees. Funny enough, I noticed how important this is for bringing the team together.

What has been the biggest challenge? No doubt the German language. I have been struggling a lot to follow meetings and conversations, especially with giving input and being myself. A lot of our personality is hidden if one does not possess the words to express oneself. But, if working in Germany is your end goal, sooner or later you will go through this experience and "now" is always the right time to begin. (I am thankful my supervisor who is super patient with my German!)

To conclude, and I will be a bit redundant, recently I had a feedback meeting, and every single question was directed at one topic: soft skills. The job market is looking for people to be the owner of the business, not just an employee to complete daily tasks. Indeed, at Bosch, this sentiment is very obvious with all the vision and principles statements: "We Lead Bosch", "Leading my Self", "Leading others", "Safety is my business" and so forth.

Feel free to contact me for further questions.

Cheers,

Igor Carvalho Ramos  
M.Sc. WASTE Student, Generation 2018

## RINUSHA @ (B)ENERGY

My three-month internship at (B)energy started in April 2020 when the whole world was swirling in the unprecedented and unusual circumstance of COVID-19. One of the unusual circumstances that most people had to adapt to was work-from-home, and this is exactly how my internship started. My day as an intern would always start with a skype meeting with my colleagues and my boss, Katrin Pütz, discussing the work for the day and our progress from the day before. My work ranged from the different aspects of technical research for product improvement to designing artwork for greenhouse; from helping develop marketing strategies to promotional materials creation. These tasks have broadened my horizon in accepting any new challenges and widened my way of thinking. The company has a very unique concept of how they want to work.

(B)energy is a social business that provides mobile biogas technology worldwide, especially in countries where firewood and charcoal are used as cooking fuel. With simple low-tech biogas digester and light weight (B)pack for transporting biogas, the company works with local business partners to establish biogas businesses in their local community. This concept of creating opportunity for people rather than giving handouts, which causes large market distortion and hinderance in economic development, resonated with me. Coming from a country where aid-based projects are implemented just for showcasing the donor rather than promoting actual development, I understand why companies like (B)energy matter.

Biogas is a renewable energy source which focus on the waste-to-energy concept. Organic waste is the most produced waste in low-income countries and utilizing this resource by converting to energy, even at an individual level, contributes to the reduction of organic waste and helps avoid unmanaged dumping of waste. Most of these countries use firewood as a cooking fuel, which emits pollutants into the air and cause various airborne diseases. These issues can be avoided by using biogas as a cooking fuel. (B)energy tackles these environmental challenges and strives for environmental as well as financial sustainability for the users. The company trains importers and installers so that they have a sound knowledge of biogas and how they can maintain the systems. This technical knowledge plays an important role in the sustainability of the system and reduces the chances of the system being discarded by people just because of lack of basic understanding and technical support.

This new concept and mindset were refreshing and exciting to me. The everyday Skype meeting was an excellent opportunity for me to express my ideas and share my opinions. The team was quite supportive and always gave me room to learn and grow. I got to learn the perspectives of social business and economic justice from different people and network with many volunteers (or (B)angles) from across the world. The whole experience was very enriching and unprecedented indeed.

Rinusha Maharjan  
M.Sc. WASTE Student, Gen. 2018



Image: participants of onsite training in Cologne - Rinusha Maharjan

# INTERNSHIP

## HECTOR @ DÜRR AG



photo by Hector Garcia Salamero

Doing an internship in Germany, as an international student, is a great opportunity to develop hard and soft skills. I had the opportunity to interview Mr. Héctor García Salamero from Generation 2018 in order to find out more about this great experience.

### **Ms. Solis: Mr. García, what do you think were the skills taken into account in your case to be chosen as an intern?**

**Mr. García:** It was very advantageous to have background in chemical engineering. Nowadays it is, of course, beneficial to have additional knowledge about environmental engineering as the possibility of introducing its technical concepts in existing processes is desired. It was also a plus to be able to show flexibility in speaking other languages, such as English, and to be able to express myself in German, despite the fact that I was still learning (starting B2 level).

### **Ms. Solis: What was your motivation for doing an internship during your studies?**

**Mr. García:** Before coming to Stuttgart, I did not really have much experience because I finished my bachelor in Madrid and then started the master studies right away. That is why I was interested in doing an internship to get more professional experience and it is a good opportunity to improve my German skills indirectly. From the point of view of an international student, it is fascinating to understand how German companies work, too.

### **Ms. Solis: What are your main tasks as an intern?**

**Mr. García:** I am working in the Paint & Final Assembly Systems section at DÜRR AG. In this section, development and research of car-paint shop technologies, technology for the treatment of emissions (e.g. RTOs), and patents, among other activities, are accomplished.

This company offers many challenging and fascinating projects to each intern. An intern is supervised and works together with different professional teams. After one month, I have been conducting some tests, calculations, and analyses of hydraulic pumps situated in the Pretreatment and Cathodic Dip Coating section (VBH/KTL). The global idea of this project is within the framework of implementing the concept of the "Digital Factory" in components and equipment for industrial plants. The Digital Factory is an organization of software, data, and process engineers at DÜRR AG, whose purpose is to prevent failures during operation by using predicting models and data analytics. Another application is the improvement of the processes themselves (the so-called Machine Learning) to enhance the quality of the products.

In the meantime, parallel projects are carried out. It is company policy not only to provide projects to students but also to train and educate students. That is why it is possible to work with process flow diagrams, read company patents, and get technical and theoretical knowledge about other installations like EcoIncore (oven for car drying) to be ready to operate and do more tests, calculations and analyses in the following months.

This means that a student can learn how to work independently.

Continues >>



# INTERNSHIP

Other activities consisted of building filter boxes used in EcoDry X systems. These filters prevent VOC emissions from paint and similar products to the environment.

## Ms. Solis: What are your recommendations to the students who are hesitant about doing an internship?

**Mr. García:** I totally recommend doing internships because is a good opportunity to improve as a professional and to gain other skills. In comparison with working only after doing the masters, an internship can offer better chances to

learn and know more how everything in a plant works. Later there will be also time for working as a process engineer in an office.

**Ms. Solis: Thank you so much Mr. García for your time and the valuable advices for our students and classmates.**

Interview by Grecia Solis Castillo, Gen. 2016 -  
M.Sc. WASTE Course Manager  
to Héctor García Salamero WASTE Student, Gen 2018

## HiWis During Covid-19- Akash Sarvesh Verma

The goal of academic education is to enable students to work on global issues and solve problems in the pursuit of knowledge. In the M.Sc. WASTE program, research experience and practical experience are important elements.

During the Covid-19 Pandemic, a difficult time where travel stagnated and working from home became the norm, unique study opportunities presented themselves for some students. Akash Verma, a student from Generation 2019 in the M.Sc. WASTE program, is working as a HiWi at IFK in the Air Quality Department. He was part of the team that conducted historic air quality measurements during the pandemic using bicycles in the city of Stuttgart. He worked with air quality measuring devices designed for measuring NOX, CO<sub>2</sub>, O<sub>3</sub>, and particulate matter.

According to Akash, gaining practical experience in the field that he loves is vital to him, therefore, he contacted a professor about working with him on a project. As the second semester began, he was contacted by the professor regarding the project to measure air quality in the city of Stuttgart during the lockdown period.

When asked how his work was influenced by the Covid-19 pandemic, he said that he was glad to be able to contribute to the measurement campaigns. As all the industries were closed, travel was restricted, and people had to work from home, unique results in their air quality measurement campaign were recorded. Akash explained that it was an exciting and remarkable experience working on the project.

While the research was amazing, working during these peculiar times came with a different set of challenges. The team had to follow all the travel restrictions and social distancing. Their meetings were shifted to an online platform and Akash had to work from home on the data they had collected from the campaign. Working from home feels a bit unnatural to him and he hopes that everything will be back to normal in the near future.

As for advice about looking for a HiWi, Akash suggests people to formulate their goals and then to reach out to their professors for opportunities. Demonstrating a strong willingness to learn and dedication to growth are the keys to finding a

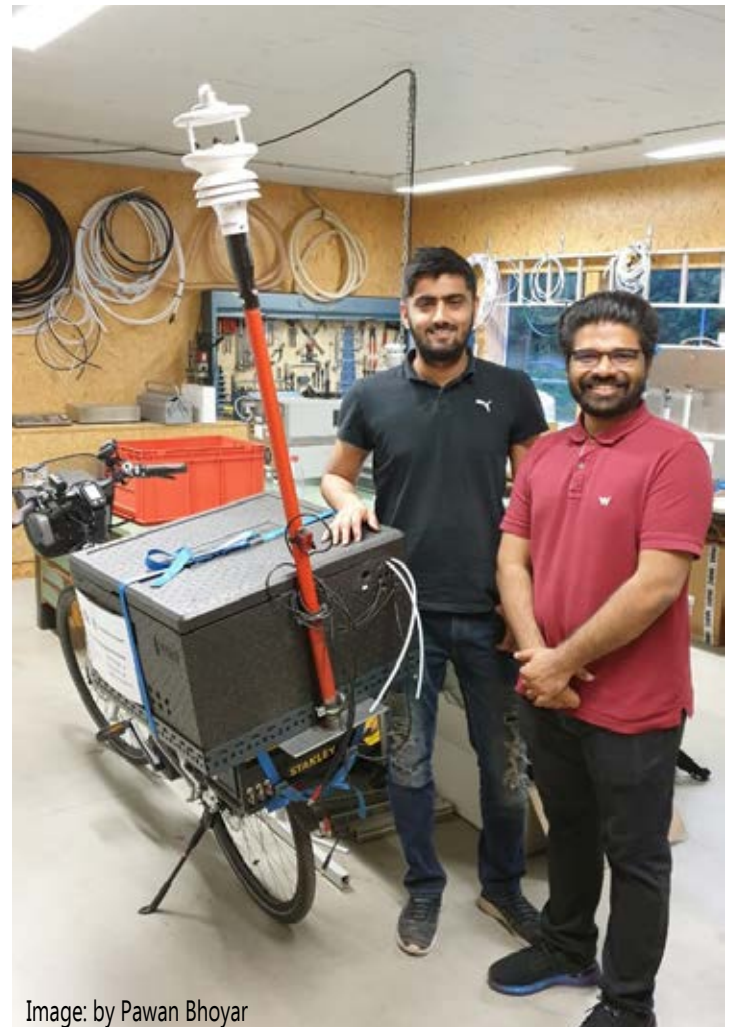


Image: by Pawan Bhojar

good student assistant position. In conclusion, he advised not to get discouraged or give up and to constantly strive to improve in job applications, interviews, and networking and eventually you will find work, even during a pandemic.

Pawan Bhojar  
M.Sc, WASTE Student, Gen 2019

# MEASUREMENTS OF AIR POLLUTANTS IN STUTTGART CITY



Image: by Pawan Bhojar

Stuttgart has a unique topographical position in the basin which results in interesting air and weather conditions throughout the year. Researchers who are alumni of the M.Sc. WASTE program have been studying for many years the effects of change in regulations on the use of fossil fuels and emergence of electric vehicles on the quality of air. Research at IFK (Institut für Feuerungs- und Kraftwerkstechnik) is conducted with the goal of bringing change towards sustainable development along with improving and advancing research.

Abdul Samad, an alumni of the M.Sc. WASTE program from Generation 2013, is currently working as a PhD researcher at IFK on the topic of "Urban Climate under Change". He has been conducting air measurements around the Stuttgart region for many years now. He conducted mobile measurements in densely populated city areas with the help of a bicycle equipped with air quality measurement devices. He conducted measuring campaigns over the course of two years before the diesel ban in Germany with the objective to compare and quantify the result after the ban. With the situation of Covid-19, however, he saw a unique opportunity for conducting measurements as vehicles on the street were reduced dramatically due to the lockdown. The aim was to identify the effect of this lockdown and assess whether or not the air quality had improved quantitatively.

This measurement campaign was conducted for a week and a comparative measurement was also done with DLR (Deutsches Zentrum für Luft- und Raumfahrt e.V.). He was supported by two students studying M.Sc. WASTE, Rohit Sheoran and Akash Verma, for the whole measurement campaign. They conducted multiple rounds throughout the city trying to cover every possible route throughout

the city. Their goal was to cover a big area and to see how the air quality situation changed and how it differs from parks, streets, federal highways, and public pathways. The methodology was to cover the area inside and around the city of Stuttgart, to show how much difference it makes whether a person is on the road or in the park. The data gathered is compared with stationary samplers, which have been measuring the air quality for much longer times.

These historic measurements, after taking multiple averages of readings from the samplers and numerous rounds by bicycle, will be compared with their records from past years.

Abdul said that he has come a long way from being a chemical engineer in Pakistan to becoming a senior researcher at IFK and advancing and guiding research.

In conclusion he said that, "For the new generations, there is a lot of potential in the WASTE program". He said they have the possibility to work in industry as well as in research. He said, as a WASTE student, he has always been identified with distinction due to his diverse knowledge. His final message was for the students to work hard and use their time at M.Sc. WASTE to gather experience through HiWi and student research projects and later apply this knowledge in their work to further their career opportunities.

Pawan Bhojar  
M.Sc. WASTE Student, Gen 2019

# RECYCLING PROJECT IN COMAS, LIMA, PERU - RECICLAJE.PE

During my last year as a M.Sc. WASTE master's student at the University of Stuttgart, I had the opportunity, in 2018, to co-found a "Verein" called Reciclaje.pe. Dessire Velez and Tobias Hahn gave me the chance to join them as a waste management expert thanks to the knowledge that I received from the mentioned master's program. First, I was invited to participate in the „Parallel Workshop" between Stuttgart, Germany and Comas, Lima, Peru in order to exchange experiences regarding recycling topics and municipality waste management. The experience was enriching since we could count on the participation of authorities and experts in Stuttgart and Comas (a low-income district where I lived my first 20 years of life). After the successful event we decided to formalize our „Verein" called Reciclaje.pe in Germany and apply for funding in order to make our Comas Recycling project a reality.

And so it was, during the last quarter of the year 2019, we started our project called „#NoComasPlástico", sponsored by CIM (Center of International Migration and Development – Germany) in the framework of the Support for Small Projects 2018 program – GIZ 2018-2020. This project represents the approach that Reciclaje.pe gives to its contribution to improving waste management. The social aspect is a key in this issue because beyond environmental awareness, we focus on the main actors in the sustainability of urban solid waste management. These actors are, among others, urban municipalities working with base collectors and collectors, thanks to whom the chain of recovery of reusable materials begins in each district. In this case, we seek to bring children and adults closer to the problem of excessive consumption of single use plastic and to close the cycle of that which we cannot avoid on a day-to-day basis.

Additionally, we are offering to formal collectors the opportunity to reuse plastic through the utilization of machines such as grinder, injector, and sublimator to convert plastic type 2 and 5 into market bags, portable wallets, and others.

If you would like to know more about our non-profit „Verein" and the status of our project, photos, videos, donations and more, I kindly invite you to check our website <https://reciclaje.pe/en/>. If you have any question or suggestion, you are free to contact us through our email [info@reciclaje.pe](mailto:info@reciclaje.pe).

Grecia Carolina Solis Castillo  
M.Sc. WASTE Course Manager



Images: by Reciclaje.pe e.V. - Workshops in Comas and Lima Municipalities

# POWERFUL WOMEN IN SCIENCE

## Powerful Women in Science Symposium: Future Challenges in Water Resources Research

Studying STEM (Science, Technology, Engineering, and Mathematics) related topics has been apart of my life for as long as I can remember. I have always been interested in building anything from popsicle stick dollhouses to tiny motor cars; from specialized furniture to bathroom upgrades. While I enjoyed a Dr. Seuss children's book or an episode of Looney Tunes every once in a while, nothing drew my attention like my collection of coloured encyclopedias from Costco or an episode of Daily Planet on the Discovery Channel. My desire to understand how things worked did not ebb as I entered high school, but I did start to realize that the pull towards science was also a pull into a man's world. As I was learning the wonders of chemistry and physics in some classes, I was also learning that men were ordained to be the leaders in religious ones. As I studied the complexities of algebra and calculus, the laws and the theories being taught were those thought up by great men of the past. Growing up, I came to unconsciously understand that STEM was what the boys do, and I was an outsider. As I entered university, this theme came to the surface. My professors were men, the majority of my engineering peers were men, the program I studied, chemical engineering, was jokingly called FemEng (because it had more than then ~25% women average for engineering [1]). Of course, my understanding of the world would not be what it is today without those who have taught me, and for that I am grateful, but I do wonder how things would be different if there was more diversity in my education.

I would have loved to have also been taught by people like those featured in the Powerful Women in Science symposium.

Since moving to Germany and joining the M.Sc. WASTE program, I have had several opportunities to attend different conferences. One on sustainable development in Heidelberg, WASTE Symposiums on new research and technology, and WAREM Colloquiums on water treatment have all taught me a lot about my field of study. The Powerful Women in Science Symposium on Future Challenges in Water Resources Research, however, brought a wonderful new perspective. The purpose: to showcase leading research on water issues being conducted around the world by women.

The symposium was held from the 18th to the 19th of February 2020 and organized by IWS (Institut für Wasser- und Umweltsystemmodellierung) at Universität Stuttgart and featured five researchers working on water resource problems from five different countries.

**Dr. ir. Astrid Blom** conducts her research at TU Delft in the Netherlands on "morphodynamics of sand-gravel rivers, as well as mass conservation models for mixed sediment that account for the stochastics of bedform geometry and sorting mechanisms within dunes" [2]. The work that she presented at the symposium looked at how rivers change over time in channel tilting, sinuosity, width, and surface texture (fining/coarsening) in response to measures and natural changes and how that is important for protecting rivers.

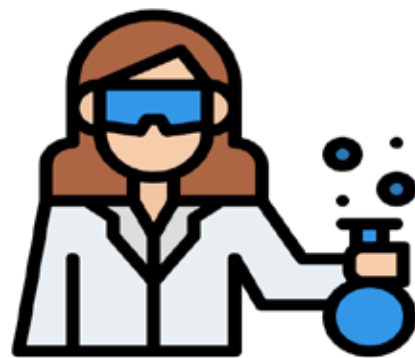
**Dr. Katharina Besemer** from the University of Vienna researches "the structure and function of microbial communities in streams and rivers" [3]. Her presentation discussed what biofilms are, their lifecycle and influence on the carbon cycle, and their composition and function in in large and small rivers.

**Prof. Dr. Kaarina Sivonen** from the University of Helsinki heads the Department of Microbiology and researches toxic and non-toxic cyanobacteria [4]. The keynote delivered discussed the importance of non-toxic and the issues with toxic cyanobacteria. Her team is using a new method involving genome analysis to better understand how the different forms of cyanobacteria are produced and discovering new compounds and bacteria as well.

**Dr. Bridget Deemer** is an ecologist who conducts her research with the United States Geological Survey focusing on "how reservoirs can affect the transport and transformation of carbon, nitrogen, and other biologically relevant elements" [5]. Methane emissions from lakes and reservoirs were the topic of her presentation, in which the experimental procedure and analysis were described. Greenhouse gas emissions for the many reservoirs built over the years is not something that has been consistently measured across the globe, and Dr. Deemer's presentation described how that is beginning to change and why it is important as the climate changes.

**Prof. Dr. Claudia Pahl-Wostl** is a professor of resource management in Osnabrück, Germany at the Institute for Environmental Systems Research. Her research is on "governance and adaptive and integrated management of water resources and the role of social and societal learning" [6]. Her presentation was on the Water-Food-Energy Nexus and how it presents challenges in water governance.

Along with the informative keynote presentations, the symposium also had a poster presentation of related work, networking opportunities over coffee and snack breaks, and a science slam creatively presenting research done by students.



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## POWERFUL WOMEN IN SCIENCE



I found the final presentation by Dr. Pahl-Wostl to be of particular interest because of the emphasis on the social issues surrounding water. It is so important to understand that the field of engineering is about making things better, whether that is inventing a new gadget, improving airplanes, or reducing environmental impact. It is therefore critical to listen to those who are affected by the projects being executed, otherwise it may make things worse. The political, social, and economic elements of a project all must be seriously considered when making decisions. Dr. Pahl-Wostl's presentation also hit close to home for me, as some of her current work is looking at water governance in Canada, my country. It might not be so well known, but the country has serious issues when it comes to water and the rights of Indigenous Peoples in Canada. The history is terrible and complicated, involving the stealing of land, cultural genocide through residential schools, and abuses of natural resources [7] [8] [9]. Water is often a point of contention as it is routinely contaminated by industries located near reservations and the effluent is not treated properly [10]. (The actor Ellen Page recently produced a documentary about such issues called "There's Something in the Water" which can be found on Netflix if you want to learn more.) This is a problem involving governance and it needs to be addressed further, which is what Dr. Pahl-Wostl will be using her vast knowledge to work with a research team to do so.

Conferences like this are a great opportunity to open one's eyes to a variety of ideas. Our world is forever changing as science and technology increase our understanding and ability to modify the Earth and beyond. But with innovation come unforeseen problems. Human rights abuses, climate change, habitat destruction, and species extinction are just a few examples of the bad which have come along with things like innovative transportation, antibiotics, water treatment, and access to information. How do we stop the suffering caused in the name of progress? One action is to give those who were historically silenced a seat at the table. Allow people with different perspectives on the world to share their ideas and works and take them seriously. If a mostly homogenous group of

people are making all the decisions, it follows that serious issues affecting people on the outside will be overlooked. History can attest to this. Science can attest to this. The current state of the world can attest to this. Change needs to happen and this can only occur by hearing the voices of those with a stake in the issue. The Powerful Women in Science Symposium is just one example of providing a platform for the spread of work done by women, but more can be done. More must be done. Diversity does not stop at gender, after all.

I know I would have benefited from being taught by a more varied group of people. I hope that children today will receive this as diverse leaders in STEM are being put up on a pedestal.

Christina Zeuner  
M.Sc. WASTE Student, Gen 2018

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# RECYCLING IN PFAFFENHOF DORMS

## A JOURNEY FOR CHANGE

After an e-mail from Nelson Rincon, with whom I had been in contact since February, it was decided that I would study the WASTE Master's programme in Germany. I was very excited, as I had applied for various courses of study throughout Europe, but I hoped that this course would accept my application, as I found the curriculum, research focus, and location to be perfectly suited to me. While I was gathering all the paperwork and applying for the visas, I had the opportunity to take a closer look at the specifics of the country. I found that Germany had a strong economy, a rich history, and institutions that people trust. An important achievement relevant to my M.Sc. WASTE course I also had read about was their enviable recycling system, described as one of the most efficient in the world and counting with one of the highest recycling rates. This fact was relevant to me as I was born in Bogota, Colombia where we are at a premature stage for our recycling system, landfilling is still common practice and there is no real culture in terms of proper management of waste and its potential benefits. I also had the opportunity to live in Australia for ten years and although Australia has a strong economy and some of its cities are considered the best in the world, unfortunately their recycling strategies did not meet the standards of a country so developed. Just recently new projects had been established on this matter and it was only in response to the China plastics ban in 2017. These two experiences prompted me to pursue my studies in Germany, as besides its education quality, I would finally have the chance to experience a proper recycling system and a culture towards waste that has been consolidated since 1991. September came and it was time to say goodbye to my family and start my new journey in Europe.

After a long flight and a few tears for the memories, I arrived in Stuttgart, where I knew that I would spend the next two years of my life learning a new language, seeing beautiful places, and experiencing German culture. When I arrived at the campus dormitory, which consists of about ten four-storey buildings, I met some people from my Master's program who lived in my building, this was a pleasant surprise. Although it was great to know that I would be close to some classmates during my course, not everything was perfect as the recycling at the dormitories was poor, communal kitchen bins were not different from each other, plastic was being mix with residual waste, and there was no clear educational information for the new residents. Later, after talking to a European neighbour of the building, she told me that our building did not follow the German recycling standards and only separated paper and glass, and the rest went into the „residual waste“. This was a bit disappointing as I had high expectations in this matter and I came here to learn how a good recycling system works and maybe understand how to implement it in Colombia or Australia.

This was an unforeseen setback, but that did not stop me from starting recycling in my new room myself. This experience was confusing at first, I used some old boxes to separate my waste, searched online for anything I had doubts about, and although I knew that my sorting was not going to be handled properly by

the home managers in the end, it made me feel better with myself. As my course progressed, I met new classmates from countries all over the world, who even though did not count with good recycling systems back home, saw the recycling in our dorms as a unexpected, dispiriting reality.

This got me thinking and help me realise this was a great opportunity to make a change and give something back to the community where I will live for the next two years. While looking for other students with similar mindsets I found out some students of the M.Sc. WASTE course's previous generations had already formed a group and started to devise a solution. This group introduced us to their recycling initiative, their expectations of the project and struggles they had encountered while trying to solve this problem. As students of Generation 2018 had been assigned to the Allmandring dormitory, while most of the Generation 2019 was housed in the Pfaffenhof dormitory, some of us decided to start focusing our efforts on our buildings.

This led me to meet Rohit Sheoran and Pawan Bhojar, students of my generation from India, residents of Pfaffenhof and eager for a change, who joined



image: Pawan Bhojar and Juan Camilo Lancheros Mayorga

Continues >>

# ACADEMIC CHOIR

me in the search for solutions. We decided to start by contacting the representatives of the residents of the dormitory and expressing our concerns to them. Surprisingly, there was massive support for our initiative from the management team of the new resident, who knew about the economic, environmental, and aesthetic advantages of such an idea and saw a great opportunity in our project to introduce an improved recycling system. Following this, we met with the management team of the Pfaffenhof dorms (VSSW) to explain our prospective plan for the dormitories. VSSW listened carefully to our ideas, reviewed our plan, and commented on their expectations of the project. After this meeting, we drew up a plan for the next steps, put together a team responsible for carrying out these tasks and began to tackle the critical points for the project. This became a great learning experience for us, as our initiative had gone from an idea to a real project, with stages, milestones, and results worked out and expected to be achieved. Today, having advocated and achieved the designation of a permanent waste tutor, our group is responsible for part of the recycling management of our dormitories, conducting awareness campaigns to raise residents' awareness

of recycling and helping the community to understand and adopt the recycling standard in place. As well, our group had been contacted to lead a similar effort in Allmandring, the neighbouring dormitory on campus. All these achievements have shown me that sometimes, as individuals, we sometimes limit ourselves to the circumstances of our countries and wait for them to change in order to for us to act. However, our experience has demonstrated that we can bring change to those circumstances if we propose it to ourselves. Additionally, along the way we could meet with other like-minded people along the way that would make the path to achieving our goals and targets more pleasant. So, we hope that this story shows the worth of pursuing your ideas, inspire students to transform them into projects and be proactive for the changes they want to see in the world.

Juan Camilo Lancheros Mayorga  
M.Sc. WASTE Student, Gen 2019

## Academic Choir - Orchester

### 1st act "How did we get here?"

Greetings friends! Eugenio and Valentina here, WASTE Students from generation 2018 and 2019. Have you already heard about the choir and orchestra of our University (Akademischer Chor - Orchester)? Well, when we started with our studies in the MSc. WASTE we had not, but eventually our inner musical drive got us searching for a platform to express ourselves. We found and joined the choir and now we want to share our journey with you in hopes to inspire you to live a broader experience, not only within the context of study.

Disclaimer: we do not sing like angels but, apparently, we did well enough at the audition to convince them to take us in. It might have also helped that we both have a bit of a musical background, either in singing at the university choir back home or being able to play Twinkle Twinkle Little Star on the piano.

### 2nd act "Life at rehearsals"

With Tuesday night comes the weekly rehearsal. Throughout the semester we got together at the K7 building downtown to get our voices and tempos in sync with those of 120 fellow singers. It was at 19:00 when we would start with our warmups from which one never knows what to expect - one day you might be a zombie gorilla making silly noises and the other you are pressure cooker trying to sing a Christmas carol - nevertheless it always managed to get us in the mood and ready to sing our lungs out.



Icons erstellt von [www.flaticon.com](http://www.flaticon.com)

The session continued with us singing as a group, following along with the notes and the piano. In the first weeks we were not far from clueless, trying to catch up with the most experienced singers, but consistently getting better as time went on. The first hour was always work-intensive so eventually we got a break to catch our breath and socialize with our peers. Being a foreigner with a still-in-progress Wortschatz made this socializing time a bit of a challenge, but at the same time the perfect environment to practice as the choir is easily dominated by 95% Germans. When the break was over the choir was split into its four basic structures comprised of the different types of voices: Bass and Tenor for the men and Alt and Soprano for the women, low and high pitch respectively. It is still a mystery what the other groups do during these sessions, but in general it is easier to correct the intonation and pronunciation of a bunch of non-native speakers trying to sing in Latin if it is in a smaller group. According to the German punctuality, rehearsals would end at 22:00 sharp and we would then be free to socialize before saying goodbye... or maybe not.



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# ACADEMIC CHOIR

## 3rd act “All ready for the big day”

Even though there was a set routine during the semester, the choir activities were far from monotonous. Some weekends, especially the ones close to the end of the semester, consisted of day long intensive rehearsals with the orchestra. These weekends are our personal favorites, hearing the whole ensemble and being deafened by the percussion and the brass instruments made our souls feel full. And when you think this could not get any better, the rehearsal breaks included a pizza buffet and the opportunity to make a bunch of new acquaintances. The most intensive weekend was in Ochsenhausen, a former monastery two hours away from Stuttgart. We would say this rehearsal weekend was like a camp for classical music enthusiasts - we ate, dreamt, and breathed music. Here, for the first time in the semester, we rehearsed with the four professional soloists. It is truly mesmerizing hearing them sing with their full power. The weekend ended with a small concert, which was perfect for helping us get familiarized with the whole performing-in-public thing.

All this work culminated in one long concert day in the case of the past winter semester the date was February 2nd. On this day, everything we practiced for had to be executed in the span of a few hours. We wore our best black clothes, we rehearsed for one last time, and we carried the excitement and nervousness of performing in front of the faces of hundreds of strangers. Luckily for us, we were singing with a safety blanket of 120 fellow singers – much respect for those four soloists. Standing on the stage waiting for the signal of the director, gives your body a shot of adrenaline that you can also feel coming from all the musicians around you. We gave our very best at that moment, feeling each note, singing our souls out. This last concert was particularly emotional as it was the

last one directed by our dear Veronika Stoertzenbach, who was in charge of the Akademischer Chor of the university for the last 30 years! The emotion of all musicians while singing and playing those last notes was of a warm farewell to her.

## 4th act “What’s going on now?”

Year 2020 has been considerably harsh on our everyday lives and being a big group activity, the choir and the orchestra have not been exempted from the measures taken against the spread of the Covid-19 virus. For instance, rehearsals and concerts for this summer semester had to be sadly cancelled and, even though this hit us all awfully hard, it did not stop us from making music. At the beginning of May, led by the new director, Mihály Zeke, the choir and orchestra of our university united to record an online concert of Verdi's *Va Pensiero*. This was a token of support to our sister orchestra in Bergamo, which was badly shaken by the pandemic. If you are interested on watching this video, you can go to the Facebook profile: Unimusik Stuttgart.

As for now, the fate of the choir and orchestra for the winter semester is yet uncertain. Meanwhile, we feed on the great memories and experiences that we collected along the way. Whatever comes, the music will not stop and we are looking forward to a great future, hoping more people will get to have an experience as fun and cultivating as our own!

To find out more: <https://www.unimusik.uni-stuttgart.de/>

Eugenio Arellano M.Sc WASTE Student, Gen. 2018 and  
Valentina Nava M.Sc. WASTE Student, Gen 2019



Image: On the left is Eugenio and then Valentina with two fellow choir members in the right. Photo by Igor Carvalho Ramos



## M.Sc. WASTE - ART!



VA

„Tree of life towards a fair humanity” Inspired by a traditional Mexican handcrafted sculpture (Árbol de la vida) telling a story starting from the bottom to top.

by Valentina Nava  
M.Sc. WASTE Student, Gen. 2019



# NEWSLETTER

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**M.Sc. Air Quality Control,  
Solid Waste and Waste Water  
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