

INDO-GERMAN SCIENCE & TECHNOLOGY CENTRE

Prof. Dr. Harish Pothukuchi, assistant professor for Mechanical Engineering at the Indian Institute of Technology (IIT) Jammu, undertook a two-month research stay this year at Forschungszentrum Jülich's Institute of Energy Technologies – Electrochemical Process Engineering (IET-4). This was part of the Indo-German Science & Technology Centre's (IGSTC) Paired Early Career Fellowship in Applied Research (PECFAR) programme. In this interview, he talks about his experiences.

“I AM VERY GRATEFUL TO HAVE HAD THIS OPPORTUNITY!”



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Khaled Yassin and Harish Pothukuchi in Jammu during Khaled's visit to India.

How did you learn about this funding programme and why did you come to Forschungszentrum Jülich?

Prof. Dr. Harish Pothukuchi: My colleague at IIT Jammu told me about the IGSTC call. I knew Jülich from my previous stay here as a PhD exchange student. So, I contacted my former collaborator Dr. Stephan Kelm at the Institute of Energy Technologies to initiate a collaboration. Stephan put me in contact with Dr. Khaled Yassin who is a scientist/researcher at IET. With the help of Stephan, Khaled and I then drew up a concept for a research collaboration and sent it to the IGSTC.

What is IGSTC and what are the conditions for obtaining funding?

Prof. Dr. Harish Pothukuchi: The Indo-German Science & Technology Centre was established as a joint initiative of India's Department of Science and Technology (DST), the Government of India, the German Federal Ministry of Education and Research (BMBF), and the German Federal Government. In one of their numerous programmes, they invite early-career scientists from India and Germany to submit applications to the Paired Early Career Fellowship in Applied Research (PECFAR) programme. Applicants need to be under 35 years of age and funding covers a maximum research stay of two months per person. So, I came to Germany for two months in early summer 2024 and Khaled joined me in Jammu for one month in August.

How was the application process?

Prof. Dr. Harish Pothukuchi: The application process was fairly straightforward. We described our project in one to two pages. The main difficulty was in obtaining a visa. I simply couldn't get an appointment slot at the German embassy in Delhi. In the end, I was given a visa exactly one day before my flight to Frankfurt.

What is your research project about?

Prof. Dr. Harish Pothukuchi: It is about the safe use of hydrogen technologies. We investigate liquid hydrogen spills. When a pipeline carries liquid hydrogen, what happens when there is a leak? Liquid hydrogen needs to be kept at very low temperatures. When it is exposed to normal temperatures, as can happen during an accident, it will boil-off immediately. We use numerical modelling of multi-phase flows to simulate the way the hydrogen changes form. At first, it is liquid, but after a leak, it changes to become a film on the ground surface. Inflammability increases. Hydrogen fumes are also formed. For people who are present around the spill, this means that visibility decreases and there is a danger of suffocation. The aim is to find out how much time there is to evacuate people safely in such a situation. The numerical modelling we employed was originally developed in Jülich using the OpenFOAM platform. The code is open but everybody writes code differently. Now that I have understood the code sufficiently, I will continue working with it at home, adding my own elements and tailoring it for different applications. All in all, we are seeing some good results and we hope to publish our work soon.

How will you to continue the collaboration?

Prof. Dr. Harish Pothukuchi: I will look for master's students or PhD students from IIT Jammu to send to Jülich to continue the collaboration. We also envision further combined research projects. There are different funding options such as the German Academic Exchange Service (DAAD) or the Alexander von Humboldt Foundation.

Did you notice a difference in the research culture between India and Germany?

Prof. Dr. Harish Pothukuchi: Oh yes! In Germany, there is a greater emphasis on punctuality – people work from 8 a.m. to 5 p.m. and then leave. In India, we are not so rigid. Working hours change every day – sometimes this makes us less efficient but perhaps sometimes we are also more flexible. The work-life balance is better in Germany, too. In India, work spills over into the private life, as we all stay together on campus. My PhD students and I keep interacting about the teaching or research assignments I need them to do. An advantage of the Indian culture is the rapport and emotional connection between the professors and the students – I feel it is much stronger.

How did you find accommodation in Jülich?

Prof. Dr. Harish Pothukuchi: Stephan and Khaled really tried hard to get me into the guest house but it was fully booked. So, I stayed in a hotel. I received € 2,300 in allowances per month, roughly half of which went towards the rent! But that's fine.

And your collaboration partner, where did he stay in August?

Prof. Dr. Harish Pothukuchi: He stayed at our guest house in Jammu. It is located on the university campus.

Do you have any advice for future exchange programmes?

Prof. Dr. Harish Pothukuchi: When I came, I knew the conditions here, as I had already visited Forschungszentrum Jülich and Stephan and Khaled always provided me with guidance. For newcomers, a general set of instructions might be helpful. They should cover issues like accommodation and transport. There is a € 49 ticket that allows you to travel around on regional trains. But what is the best way to purchase it? I found out from my colleagues that the easiest way to buy the ticket is online, because when you try to purchase it directly, Deutsche Bahn employees may not speak English – and it also takes two weeks for the ticket to arrive. Some information on the town might also be helpful, like where do I find a supermarket and what are its opening hours? Finally, it is good to know the dates of public holidays when everything is closed, including Forschungszentrum Jülich. One such holiday happened to be on my first day here – it was on a Monday.

So how would you sum up your stay here?

Prof. Dr. Harish Pothukuchi: It was great! I am very grateful to have had this opportunity. I sincerely thank my hosts at FZJ and the IGSTC for funding the exchange programme. I would also like to thank my institute (IIT Jammu) for supporting me in taking part in this exchange programme.

The interview was conducted by Kristin Mosch.