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Column New Impulse

Back to the Netherlands after time abroad

In this column, researchers who have been recently appointed to one of the Dutch mathematics institutes, introduce themselves.

My name is Olga Lukina. In July 2022 I started as a tenure-track Assistant Professor at the Mathematical Institute of Leiden University.

For me, coming to the Netherlands was returning back to the place where I started my scientific career (at a postgraduate level), as I previously spent four years here, doing my PhD at the University of Groningen. While abroad, working in the UK, USA and Austria, rather than losing the connection with the Netherlands, I met new researchers from the Dutch mathematical community. So it was very natural for me to return to the country I already knew, and join the mathematical community to which, I felt, I already belonged.

I grew up in Russia, in the Perm region in the Ural mountains. Since I can remember myself, I was curious about exact sciences, languages and other countries. I remember being fascinated around the age of 8 by a book with physics experiments which a child could do at home. I learned my first words of English around that age from my mother. My favorite book around that time was about a group of sailors traveling on a ship around the world, visiting different countries. While in Japan, they were invited to visit a Japanese family who cooked for them sukiyaki, the marble beef hotpot. I tried sukiyaki when visiting Ritsumeikan University near Kyoto in 2019, and it was as delicious as the book said!

At the time when I was growing up, Perm State Technical University, which I later attended, was running programs for talented children, helping them learn mathematics and physics outside of the school curriculum. I participated in those programs.

A few times my classmates and I went to the Math Camp, organized by the university. One of the activities we had in the Math Camps was Math Fights: two teams were given math olympiad type problems, which they had to solve. Then one team would present a solution to the other one (the opponent), whose task was to criticize the solution; then they would switch the roles. I also just read science books on my own. My father had an engineering degree in physics, and my mother in chemistry, and they still had a few science books at home. I remember learning logic from my father's book on electronics, and trying to learn probability from *The Feynman Lectures on Physics*.

After getting my Master's degree in Mathematical Modeling at Perm State University, I worked for a few years in IT. I enjoyed that at the beginning; but after an initial period of learning, a job at



a company settles into a routine, and I was missing the joy and challenge of learning new mathematics. So I decided to pursue a PhD, and see a little bit of the world at the same time. That was the reason I looked for a PhD position abroad, and that was how I came to the Netherlands, to the University of Groningen.

After finishing my PhD in integrable Hamiltonian systems, I worked at the University of Leicester in the UK, University of Illinois at Chicago in the USA, and University of Vienna in Austria. My research interests gradually shifted to minimal sets of foliations, and from there to the study of group actions on Cantor sets, and their applications. I still work in dynamical systems, but with a very different type of objects. I am never bored, since I get to learn and create new mathematics every day. I was lucky to experience and learn the culture of four very interesting countries. I now can speak four foreign languages (but only one well).

Educational systems in different countries are of course influenced by the way their society is organized, and the problems universities in different countries face and solve are different. Most recently, I taught in the USA, at a public university, University of Illinois at Chicago (UIC). In the USA (and especially in very large cities like Chicago), there is a huge divide between the opportunities in early education that the rich and the poor have, and public universities play the role of social lifts, sometimes giving a second chance to those who did not have access to a good high school. At UIC, we payed a lot of attention to helping students to stay on track and finish the course, especially in the large first-second year service courses. Professors and teaching assistants were required to hold two or three office hours per week, where students could come for individual help with the course material. There was also a walk-in Math and Computer Science Learning Center open five days per week from 8am to 6pm, where students could get help with their homework. I found that in general students had very good attitude towards learning, they studied hard and wanted to succeed. A rewarding

part of teaching at UIC was to feel that I am a part of a social change, helping people to change their life to the better.

The problems I described above are not applicable to the Netherlands, where the level of preparation of students when they enter the university is more uniform. Students here are considered to be independent, and it is their responsibility to keep up with the workload. So far, I found students very well-prepared and motivated to learn. Questions they ask are about further applications of theories they learn, rather than about solutions to the homework.

Comparing the research environment in the countries where I worked, there seem to be a lot more joint activities happening in the Netherlands at the national level than in other countries. For instance, there are monthly national seminars like the Mark Kac seminar on Stochastics and Physics, and regular joint events with participation of research groups from a few universities. This is possibly due to different cities in the Netherlands being very close and easily accessible by train. For instance, in Chicago it took me forty minutes to get from my apartment to the campus of the university. It takes me approximately the same time to get from Leiden to Utrecht. Overall, I feel that the Netherlands has a very vibrant research atmosphere, with a lot of interactions between groups of researchers and universities. I look forward to being a part of this environment!

The country has changed during the years I was away. It has moved firmly into a digital age; it seems to be impossible to get by without a smartphone. On the other hand, the variety and quality of food available when one wants to eat out has improved dramatically; although it seems to be impossible to get a table on a Friday evening without a reservation. When a PhD student in Groningen, I enjoyed shopping at the Vismarkt on Saturdays. Now I often buy fish, vegetables and flowers at the Saturday market on Nieuwe Rijn in Leiden; I am glad this Dutch tradition hasn't changed!