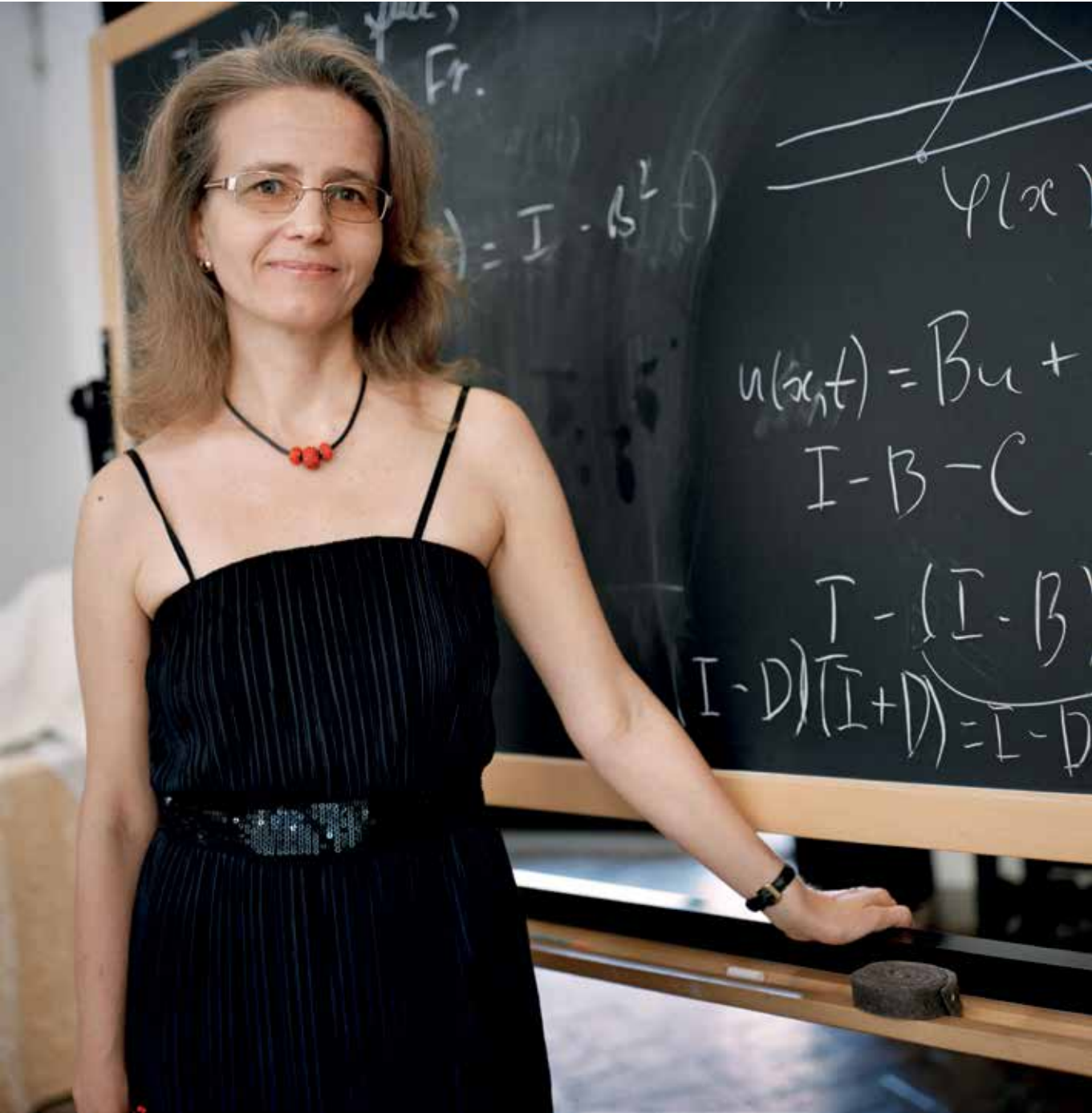


Irina Kmit

$$(\tilde{U}-U)(t+2d,t+d)z=\int_{t+d}^{t+2d}U(t+2d,\tau)B(\tau)\tilde{U}(\tau,t+d)z\,d\tau$$

Irina Kmit studied mathematics at the Lviv University in her home city in Ukraine. During her PhD in the theory of partial differential equations, under the supervision of Prof. Sergij Lavrenyuk, she got interested in hyperbolic PDEs. From 1999 to 2001 she worked at the University of Vienna, thanks to an ÖAD fellowship. In 2009 she was awarded a Humboldt fellowship, which enabled her to work at the Humboldt University of Berlin. Later, she held teaching and research positions at the Lviv Polytechnic University and the Ukrainian Academy of Sciences. Currently, she is working at the Department of Mathematics at the Humboldt University of Berlin.

- Research topics:
- Analysis
 - Hyperbolic differential equations
 - Boundary value problems
 - Bifurcation
 - Stability analysis

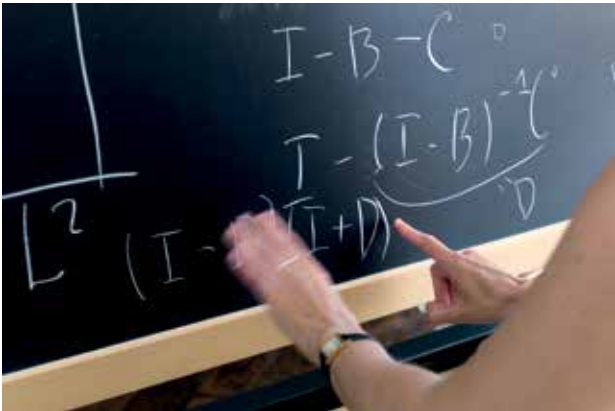


Cortona, Italy, 2015



How and when did you choose to do mathematics?
I was born in Lviv, Ukraine. Here, Stefan Banach spent 25 years of his life (1920–1945). He was one of the greatest mathematicians of the 20th century, and his spirit is still present in this city with a long mathematical tradition. I enjoyed mathematics from an early age. I remember asking my teacher at school for additional mathematical problems to solve. Later I participated in mathematics competitions. We had a very good secondary education with a focus on natural sciences. I had a very strong mathematics teacher since the 8th grade (so I must have been 14 then) who was also interesting as a person. Not only did he teach us mathematics but he also encouraged us to do sports. He considered these two disciplines most important. I still enjoy sports and professional dancing very much, but stopped practicing it on a regular basis after I had my children, now 7 and 14 years old.

Were you then encouraged by your family, friends or other people around you?
The secondary school teacher I mentioned, and later my supervisor at university, encouraged me to become a mathematician. As a 3rd year



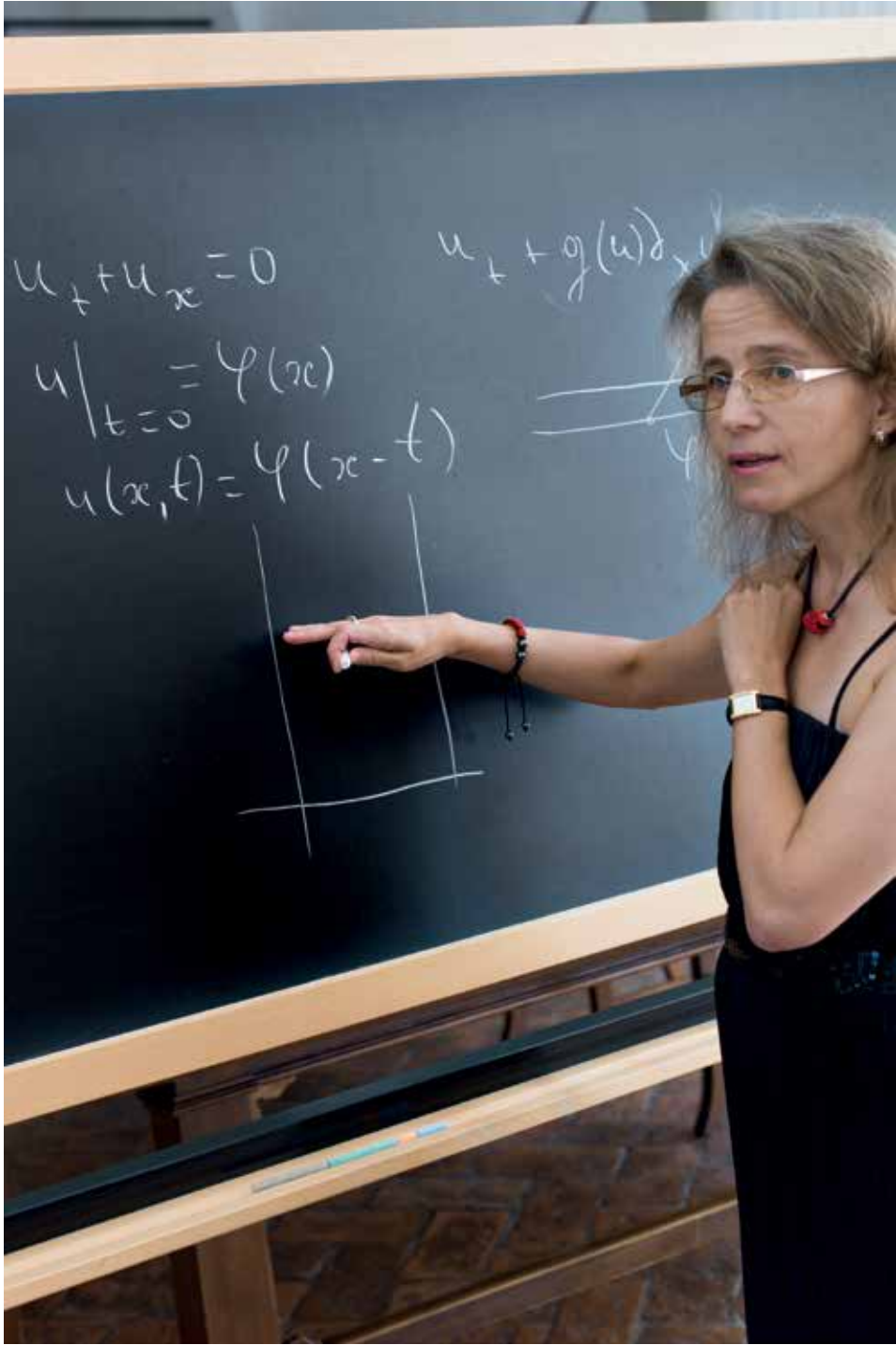
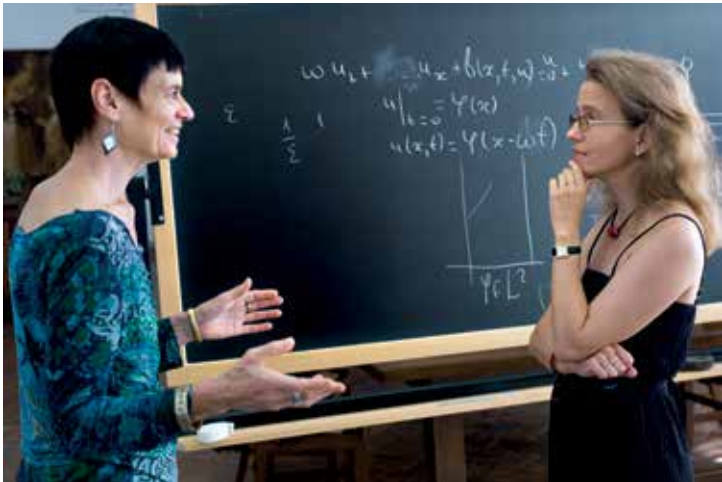
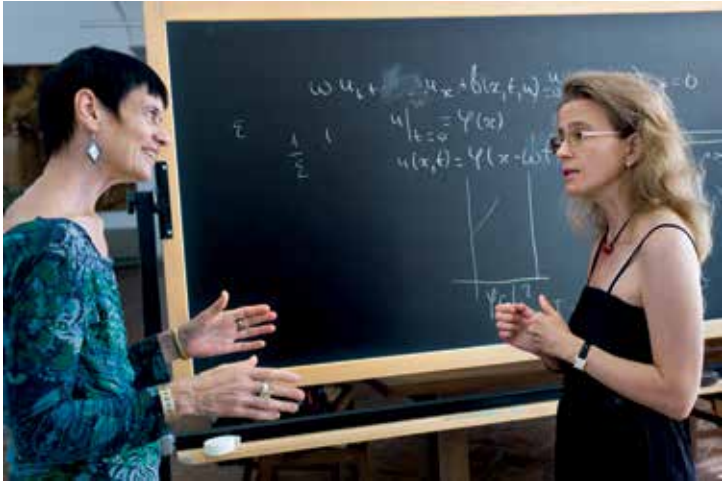
student, I started working on parabolic partial differential equations (PDEs), but was not too happy with this topic. My advisor suggested I should switch to hyperbolic PDEs and later gave me a lot of freedom to carry out my work as I wished.

My father also supported me in doing mathematics. He noticed that, as a child, I liked to solve problems and bought me a well-known book by Perelman popularising mathematics. On the other hand, my mother, who was a doctor, tended to encourage me to study medicine. However, solving mathematical problems gave me a unique sensation of freedom that did not depend on what happened around me. I actually think that this was the reason why mathematics was so strong in the Soviet Union; in mathematics, people were able to find the freedom they missed in real life.

Did you come across obstacles in pursuing your career as a mathematician?
Due to economic difficulties in the nineties, there was a lack of money for science, which forced many researchers to switch to purely teaching positions. Many of my colleagues were in that situation, teaching sometimes more than 20 hours per week. I myself spent some years teaching that load at the

Polytechnical University. Those who remained at the Academy of Science had to survive with very low salaries. When I had my first child in 2001, I was at home on maternity leave, which I found quite convenient to get back to doing research. I managed to dedicate even more time to research when I had my second child, due to a reduced teaching load. My husband, who is also a mathematician, prepared his habilitation thesis when we had our first child. I prepared my habilitation thesis when we had our second child. So all in all, the time when our children were small proved to be very productive for both of us.

I have not experienced any obstacles due to the fact of being a woman. As I already mentioned, my husband is also a scientist; he works in discrete mathematics. So far, we have managed to pursue a dual career. Our home institution belongs to the Ukrainian Academy of Science. Presently my family is based in Berlin, where both my husband and I are guest researchers at Humboldt University, I at the Institute of Mathematics and he at the Institute of Computer Science. In Berlin we benefit from rather good child care and also the school system. Our children seem quite happy here while we are busy solving research problems.



In retrospect, are you happy to have chosen mathematics or do you have some regrets?
For you, what are the joys of mathematics?
What are the hardships?

I am very happy to have chosen mathematics and have never envisaged anything else than working in mathematics. Mathematics is a language and you can express deep things in just a few words. I remember how I was charmed by the epsilon-delta formalism during my first course of analysis. You can communicate very efficiently in mathematics, which is a language without borders. Communicating with other mathematicians in this language is very exciting and enriches your life (as mathematicians usually have many other interests besides mathematics). Every mathematician has his or her own way of working and thinking. I like working with colleagues in Berlin, Vienna and Innsbruck, in Lviv, Kyiv and Novosibirsk. I see mostly positive sides to mathematics; the only drawback I can think of is that it is not funded well enough. Applied (or sometimes seemingly applied) sciences are well funded, whereas fundamental sciences such as mathematics lack funding. I appreciate the fact that the Humboldt foundation, from which I got

a fellowship for my first stay in Germany, does not follow this trend, and still supports scientists doing fundamental research.

What would you recommend to a young woman in your country wanting to start a career in mathematics?

One should feel a drive to do mathematics, and I would not recommend mathematics to someone otherwise. If a young woman feels this drive, I would encourage her to do mathematics, and not to hesitate, moving on step by step. Time will take care of the rest, and if you are patient enough you will get satisfaction from your results. I would also recommend to her to find some balance between work and family, and to enjoy both.

Could you describe your favourite personal achievement in mathematics?

I work on hyperbolic differential equations. In this area we still lack results on regularity, smooth continuation, bifurcation, and stability of solutions, comparable with the rich theories of parabolic, elliptic or ordinary differential equations. In the last years, with colleagues, we managed to make progress in this direction, obtaining interesting results on Fredholm solvability, bifurcation and stability analysis, and

propagation of singularities in the hyperbolic case. I am rather proud of these advances.

Could you write a few lines describing your topics of research in a manner understandable to non-experts?

Life is not uniform, it is full of singularities, with unexpected situations arising; it sometimes jumps up and then jumps down. The hyperbolic partial differential equations (PDEs) I am studying describe singularities. Sometimes the singularities come from outside, sometimes from inside, just as in real life! Hyperbolic PDEs with singularities is the world in which I am working, and it is real for me even if it looks illusory and mysterious for the general public.

