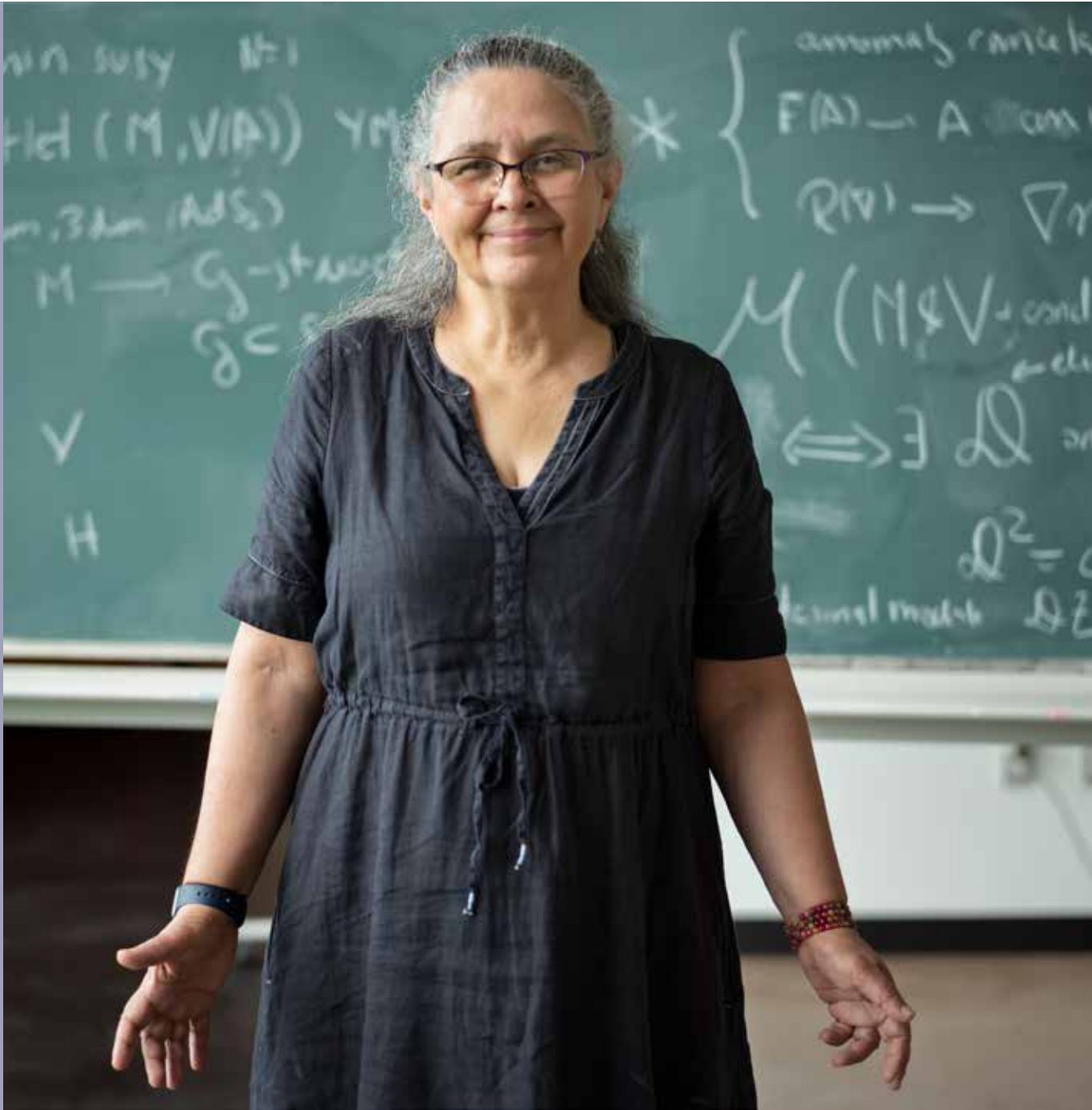


Xenia de la Ossa

$$S = \frac{1}{4} A(\varphi_*) = \frac{14\pi}{4} \left\{ k^2 \left(\frac{7}{\pi} \frac{L_4(2)}{L_4(1)} \right) + \left(l - \frac{5k}{2} \right)^2 \left(\frac{7}{\pi} \frac{L_4(2)}{L_4(1)} \right)^{-1} \right\}$$

Xenia de la Ossa was born in Costa Rica from a Costa Rican father and a Salvadorian mother. She grew up in México City, Bogotá and Guatemala. Xenia did her undergraduate studies in Physics at the Universidad del Valle in Guatemala and a MSc at the University of Costa Rica. She obtained her PhD in Theoretical Physics at the University of Texas at Austin. She worked as a postdoc at the University of Neuchâtel, the Institute for Advanced Studies, the University of Texas at Austin and at the University of Oxford, where she was then hired as an Assistant Professor and eventually became a full professor. Apart from working on her research, Xenia took a leading role in the creation of the Masters degree in Mathematical and Theoretical Physics in Oxford, for which she received a Teaching Award in 2018. In 2019 Xenia became a member of the Costa Rican Academy of Sciences.

- Research topics:
- Mathematical structures in physics
 - String theory
 - Geometry, number theory and the relations between them



Onna-Okinawa, Japan, 2023

How and when did you choose to do physics?

I was born in Costa Rica, from a Costa Rican father, a Salvadorian mother, and was educated in Mexico, Colombia and Guatemala. As a child I always liked sciences, biology, chemistry. I couldn't picture myself as a physicist or mathematician until later in life, however I always knew I was good in mathematics, which I found beautiful. I then went to university in Guatemala, where I started in biology, and during that year I learned what mathematics and physics were. By the end of that year, I had switched to physics. It was during those years as an undergraduate when I began realising what research might involve. I moved back to Costa Rica where I did my masters in theoretical physics. I had an excellent master's supervisor who strongly encouraged me to continue my studies. I went to The University of Texas at Austin to do a PhD in theoretical physics. I had a child in the middle of the PhD, which naturally slowed down my research towards my PhD thesis. I was not sure I was going to continue in academia at the time. My research group continued paying me as a PhD research assistant for longer, and I found this very helpful. After this, I did three postdocs and finally ended up in Oxford.



Were you encouraged by your family, friends or other people around you?

I had a lot of support from my family, my Salvadorian grandparents, my parents were supportive, and also all my siblings. I am one of five, all very close in age except for the last one. I was also encouraged by many

of my teachers. I had good friends who were supportive, but other people were not so supportive. From little things like people ignoring your presence in discussion groups, to inappropriate racial comments. I also encountered people who were very dismissive when I told them about these incidents.

Did you come across obstacles in pursuing your career as a physicist?

Yes, I did. When you face an incident or an obstacle, it is often difficult to know what the reason is, whether it is because you are a woman, you are from Costa Rica, or they just don't like you. You often get the feeling that you don't belong.

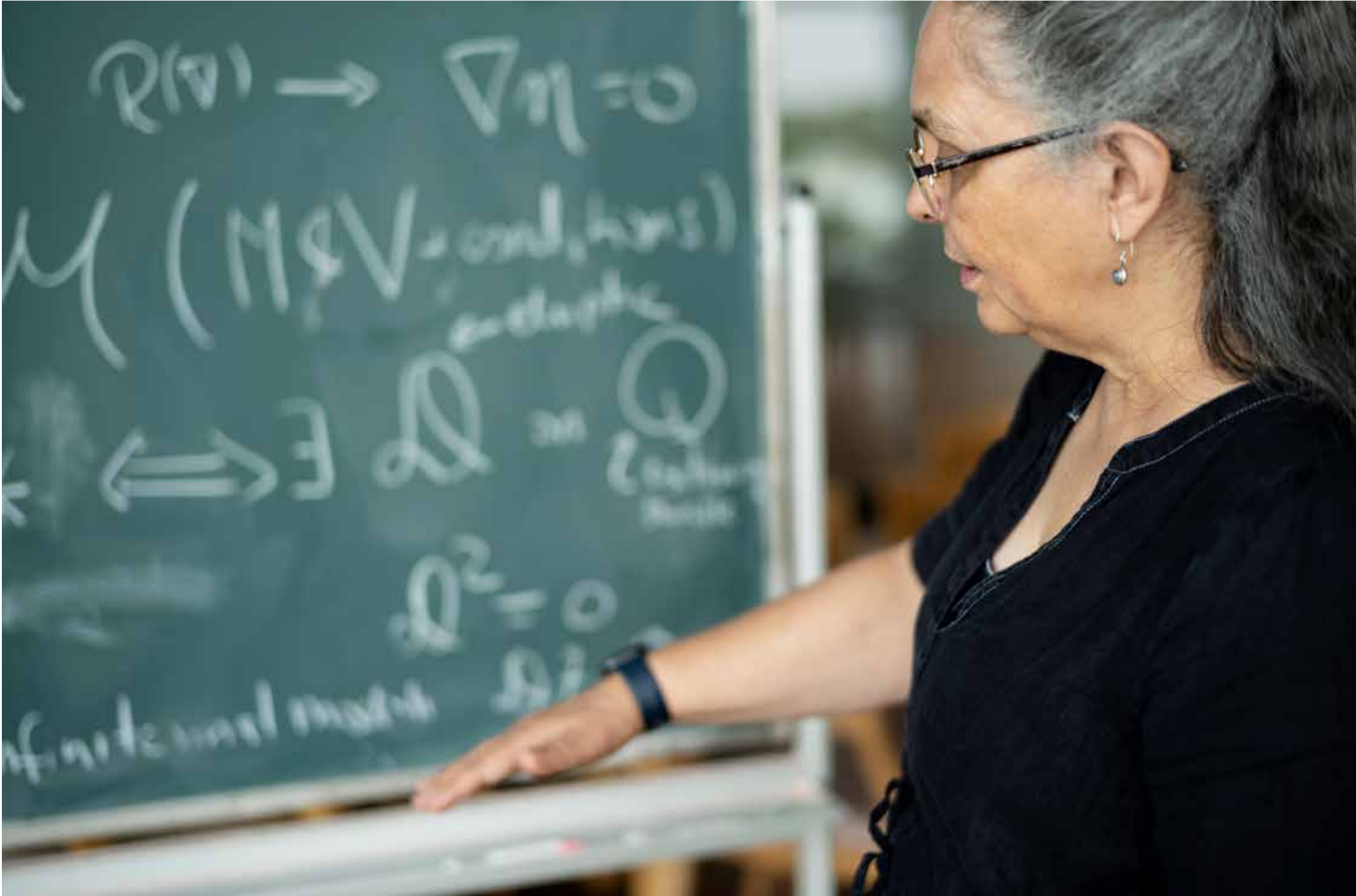


Things happen frequently, for example someone recently asked me to stop talking in a meeting. Some people thought that it was okay to ask me, even interrupting my work, where Philip was. There are also micro-aggressions from colleagues, including those who get upset at me in discussions. Also very difficult have been the obstructions to promotion. You have to wear a shell to protect yourself.

Philip is my husband and a mathematical physicist in the same research group as me. Many people believe he was my PhD advisor. We have been collaborators for a long time and the credit is often given to Philip, which has seriously affected my career progression.

In retrospect, are you happy to have chosen physics or do you have some regrets? What are for you the joys of physics? What are for you the hardships of physics?

The discovery process is very joyful. The process of asking a question, answering it, and the process in between, constructing a path. I like the fact that you are free to choose the problem you want to think about. The creative side is also satisfying. Creating something new doesn't happen every day. I find this process very rewarding.





It is often very hard to answer the questions you ask, sometimes the answer is out of reach, and sometimes the process is rather tough. You might realise that answering the question you posed is beyond what you can do. This can be very frustrating. I enjoy working with PhD students and early career researchers. Almost all my papers have a PhD student or an early career researcher as a collaborator. When working with PhD students, you do have the responsibility to produce papers reasonably fast. So one has to design research projects which should have an outcome, at least partially. I think this is fun, even if complicated.

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

I would ask her what she likes doing, what motivates her to work. You need to be highly motivated to do research. I would ask her what questions she would like to think about. I would try to guide her to what courses she has to follow and would give her practical advice. For postdocs, I would try to discuss with them their status as a postdoc, and future career prospects. Some have not considered all the options. I would try to open up their perspec-

tives and discuss other possible career paths. A good group of peers and a supportive group of friends is important, people they feel comfortable with. It is important to avoid isolation, and talking to peers is essential.

Could you describe your field of physics in simple words?

I like to understand the building blocks of matter, how and why they behave as they do, and how they interact. I would like to understand the mathematical

structures that underlie the theories describing physical phenomena, like the quantisation of the gravitational field. We have made progress but so many questions remain open.

