

COST ACTION MP1405
Quantum Structure of Spacetime

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Opening talk

Standing on the river bank to think

Many thanks to **Paolo Aschieri** and **Juraj Tekel** for hosting this exhibition here in Bratislava and honoring it with a prize. Both the photographer, **Noel Matoff**, who unfortunately could not be here today and I are very grateful for this recognition. This honour makes us proud of an exhibition which has turned into a grown up child, leading its own life while travelling around the world and meeting all types of audiences. We view this prize as the exhibition's prize; let me take this opportunity to thank other protagonists who took part in this adventure, namely **Sara Azzali** (Potsdam), **Magdalena Georgescu** (Israel and Canada) and **Alexandra Antoniouk** (Kiev).

The exhibition consists of 13 portraits of female mathematicians from 13 different European countries, one of whom **Katrin Wendland**, is here present. The photographs are by Noel Matoff, who also chose the number 13 and Sara Azzali helped me with the interviews, some of which were carried out in the last EWM meeting in Cortona three years ago.

The idea of the exhibition stems from an invitation I received in the autumn of 2013 from **Charu Goel**, a post-doc at the University of Konstanz, who asked me to deliver a talk at the "*Women in Maths*" platform. I was about to decline the invitation, arguing that as a woman of mathematics (see the title of the exhibition), so one who aims at producing mathematics, I am not competent to analyse the question of women in mathematics from a sociological point of view. It then suddenly occurred to me that, as an active actor in the world of mathematics, I could instead propose a subjective outlook on this world. I have often been impressed by the women of mathematics I met throughout the world, and thought I could base my talk on testimonies by ten of them, from different countries (Germany, Austria, Russia, China, Burkina Faso, India, Japan, Australia ...). So I sent these ten women I had in mind a message, asking them to answer a few questions relative to their career and life paths, and to send me a photographs. This way I gathered ten rather exciting testimonies which found a very responsive audience when I presented them in various places. Not wanting to leave this precious material at the state of a small booklet, I got in touch with a friend film maker **Agnes Handwerk**, who had previously filmed mathematicians, and asked her whether she thought this material could serve as a basis for a more ambitious film project. We were brain storming while leisurely walking back from a

maths event in Berlin, when Agnes came up with the idea of turning this project into a touring exhibition in view of the upcoming 2016 ECM meeting in Berlin. I happened to have a friend photographer, Noel Matoff, and thought I would ask her whether she would be ready for this adventure, secretly hoping she would decline my proposal, since I was anticipating the amount of extra work that would come with it. Her positive answer was what launched this adventure.

The exhibition, which is now near to 3 years old, was indeed born in July 2016 at the ECM held at the Technical University in Berlin. After a difficult time during its two years' gestation before the opening, in fear of a lack of necessary funding to give it birth, its life has become easier after that. It has since then visited near to hundred locations in some 20 countries around the world. Starting from Germany, the exhibition first went to Italy, France, England, Bulgaria, Ukraine, Switzerland, Holland, Norway and beyond European borders, to Australia, Cuba, Chile, Colombia, Ecuador, Lebanon and Senegal. It is now reaching out to Japan, with an opening planned for the month of March in Tokyo. In its short life, this exhibition has met many faces, as illustrated by the photographs you can see on the website of the exhibition under "Locations", which document the various venues. Unfortunately, we have no record of the reactions it has triggered along the way, yet some I can report on since I was present. Let me tell you two anecdotes, both of which involve people present here

- **Dorcas Addo** from Ghana, a young female participant at a summer school in M'bour, Senegal coorganised by **Katrin Wendland** last year (in May), asked me whether after the school, she could take Katrin's portrait back home, only Katrin's not the other panels. Wanting neither to deceive her, nor to split the exhibition with some panels here and others there, I hesitated a little and finally opted to send Dorcas the pdf files of the whole exhibition so that she could print them out as she pleased. Yet I doubt whether she had them printed out; it might have been better to just let her take one of the panels back with her. I was happy to meet Dorcas again a few months later (September) in Heidelberg. After the opening during the Laureate Forum, Karin Baur, Dusanka Perisic, both portrayed here, the English to German translator, Maria Hoffmann and myself, gathered at a restaurant. Prior to the opening that day, I had written to Dorcas, suggesting that she join us at the restaurant after the opening. Dorcas had been invited to the Laureate Forum and this was her first trip outside Africa. Heidelberg was of course new to her, yet she eventually made it to the restaurant, having landed in Frankfurt a few hours earlier. It was wet and cold that day, and I have this vivid memory of Dorcas wearing an anorak and flip flops on her feet.
- From M'bour in Senegal, let us now skip to Beirut in Lebanon. **Paolo Aschieri** had been invited to a conference in Beirut, that Georges Habib, from the Lebanese University in Beirut and myself, organized about a year ago. We had managed to show the exhibition during the meeting in spite of some logistical difficulties. Near to the end of

the meeting, Paolo came up to me warning me that he would be asking me a rather weird question, which turned out to be whether he could take the exhibition with him to the next conference in Sofia he was about to attend. I was very pleased that a man colleague should show interest in the exhibition to the point of wanting to present it himself. Also, this was the portable version of the exhibition, which weighs some 8kg, and which otherwise I was deemed to take back to Germany with me, carrying it with me on the plane as I had done on the trip to Beirut. A couple of weeks or so later, I got a message from Paolo asking me whether he could take the exhibition back with him to Italy. There, he had it shown at his son's high school in Torino. And now, here is the exhibition again, thanks to Paolo, a very efficient ambassador for the exhibition.

The exhibition which came to life in difficult circumstances in part due to the lack of support from the German mathematical community, has now reached an age of maturity. It has partly built its own path, following the steps of mathematicians, as it was the case with Paolo from Beirut to Sofia and then to Torino and Bratislava. I feel that it is now in a position to teach us something.

It has taught me that **mathematics interweaves with the biographies** of those who dedicate their lives to it, that you cannot detach the mathematician from her art, namely mathematics, an art which becomes a kind of second identity. The phrase "*I am a mathematician*" says a lot more than just "*I work as a mathematician*". The composer Elena Mendoza, professor at the University of the Arts in Berlin, told us in an interview which you can find in the catalogue that accompanies this exhibition, how essential and vital composition has been for her, in spite of the many obstacles she had to overcome to get to the position she now occupies. Creating, might it be by composing, has kept her sane Elena once told us off line.

The **sybiotic bound of mathematicians to their art** made the photographer of the exhibition Noel Matoff who portrayed the thirteen mathematicians, feel somewhat jealous; she recognized in their enthusiasm for mathematics, the same intensity she had perceived in her sister's dedication for her job as a midwife. This is why, alongside the composer Elena Mendoza, we also interviewed Noel's sister, Martina Matoff, as you will see in the catalogue.

Most of all, the exhibition and related activities around the topic of *women in mathematics-women in mathematical physics*, have taught me to **stop and think**; the very fact that we women are part of a minority within the mathematical/ mathematical-physics community, compels us to question our practices, sometimes our very position within the community. When carried by the flow of production, one does not want to "waste" time questioning one's practices, and there is a priori no need to do so unless an obstacle comes into the way. But we women, are often confronted with obstacles, and find ourselves forced to remain on the river bank, watching the flow and trying to jump back onto the boat. I have thereby learned that pausing on the river bank and reflecting on our own practices can be very fruitful and would like to suggest that others

volunteer to do so, temporarily **stepping off the boat** even when not pushed out of it, to take **time to think**.

I would like to conclude this opening talk with two suggestions for topics of possible reflections:

- what does **“belonging” to the mathematical-mathematical physics community** actually mean? What are the mechanisms that might contribute to making some women feel they don't quite belong to it... and let me stress that for having asked various female mathematicians, not being part of the **“boys' club”** is a widely spread feeling.
- **Excellence schemes** which are now a trend all over Europe and beyond, leave out many active researchers and amongst them many women. By « excellence scheme » we mean funding programs that offer large sums of money on « excellence criteria » to a few chosen projects. Amongst the many reasons for the fact that women often find themselves left out, waiting on side roads for their turn to come, is that they tend to censure themselves and not want to put themselves forward when competition rises. This calls for a questioning of selection schemes based only on excellence criteria. They have shown to lead to a homogenization of the selected population at the cost of diversity. Tests conducted on the egg production of a group of hens, show that selecting only productive hens does not necessarily increase the productivity. They tend to compete and fight, whereas introducing more diversity with less “excellent” hens mixed with “excellent” ones will lead to a better balance and increase the production in the long run.

With this very factual reflection on the productivity of a group of hens, I would like to conclude this talk.

Thank you for your attention.

Sylvie Paycha