A conversation with

Alba Grassi

First Winner of the SwissMAP Innovator Prize

Alba completed her Master's in Physics at the ETH Zurich under the supervision of our member Matthias Gaberdiel. She was a SwissMAP member until 2015, when she completed her PhD Thesis under the supervision of Marcos Mariño at the University of Geneva.

She then did a postdoc at the ICTP in Trieste, Italy. And spent some time at the Simons Centre for Geometry and Physics in Stony Brook, New York.

At the start of 2020, Alba received a PRIMA grant and was appointed professor. And in November 2020, she rejoined SwissMAP as a member, when she took up a joint position between CERN and the University of Geneva.

Her research interests are string theory, quantum field theory and mathematical physics.

The SwissMAP Innovator Prize was introduced in the year 2015. It's first recipients were Alba Grassi and Vincent Tassion. Now, almost 6 years later, we decided to sit down with them and catch-up.

- You were recipient of the first SwissMAP innovator prize in 2015. Can you tell us what your experience of being part of SwissMAP was like at the time?

At the time, I was a PhD student and SwissMAP was in its early years. As a student, I remember being naively happy that the SNSF decided to commit and, in a sense, to recognise the importance and relevance of the research field I was working in. This gave me a positive perspective about the future of the field.

- Can you briefly tell us about your academic path since the Innovator Prize?

After I graduated, I first did a postdoc at the ICTP in Trieste, Italy. This was a very interesting experience. ICTP is a research centre with a strong commitment to promote science in developing countries. The combination of these two aspects makes this place unique. So that was my first experience.

After that, I went to the Simons Centre for Geometry and Physics in Stony Brook, New York. This was also an important experience, which contributed further to my scientific development. And finally, I came back to Switzerland and joined SwissMAP once again.

- Did you keep in touch with people from SwissMAP?

Yes, I did keep in touch with the SwissMAP program. I had some collaborations with people from SwissMAP. This was also facilitated by the fact that my family lives in Switzerland, so I would come visit them regularly. And once you are in the area, you of course use the occasion to visit collaborators.

- How did you find yourself being part of SwissMAP again?

I was first awarded with an SNF PRIMA grant (with ETH Zurich) and then I was offered a joint position between the theoretical physics department of CERN, and the mathematics department of the University of Geneva.

I can now fully appreciate the extraordinary opportunities that SwissMAP provides. We can organise events, invite collaborators from all over the world, and hire new scientists in our field.

This position was created explicitly within the SwissMAP framework because it allows to bridge between these two fields and the institutions in question.

- How is your experience of the SwissMAP program different now as a group leader?

As a group leader, I can now full appreciate the extraordinary opportunities that SwissMAP provides. We can organise events, invite collaborators from all over the world, and hire new scientists in our field. This is something that I can truly appreciate now, as a group leader since I can actively participate in the creation of these opportunities.

- Can you tell us about recent collaboration opportunities within SwissMAP or perhaps possible desired future ones, particularly those within SwissMAP but with a different institutions to yours?

This is quite a tough question, because I only started my new position in November of 2020. Usually, it takes some time to build new collaborations. Especially now that in-person meetings are not possible. So currently, I do not have any collaborations with people from other SwissMAP institutions. But I'm confident, that with a little bit of time this will be possible once again.

- Can you briefly describe your research?

I work on mathematical and theoretical aspects of quantum field and string theory. On one hand, my research consists in applying ideas developed in a string theory context to address and solve open problems in related fields. For example in the context of spectral theory, matrix models, Painlevé equations or black holes physics.

On the other hand, my work aims to deepen our understanding of non-perturbative aspects of quantum field theory, string theory and the corresponding notion of quantum geometry. Moreover, since string dualities play an important role in this context, part of my research is also devoted to provide rigorous tests and making some of their aspects qualitatively precise.

- Did you always know you wanted to follow the academic path?

No, not at all. I grew up in a small farm up in the Swiss Alps. So growing up, I could never imagine becoming a scientist, let alone following an academic path.

- Did your academic path change at some point in your career and how did it come about?

No, it didn't, but you never know what the future might hold. Up to this point in my career however, my academic path has not changed. The reason is, that I decided very late what path I wanted to take.

- What advice would you have for a young researcher wishing to take the academic path?

I would advise choosing a subject that you really like. Something that you love. Because it's important that you feel a passion for your specific field. And after that, just be persistent. Because things can get hard, and tough. So try not to give up when you find yourself in front of a closed door, or whenever you feel that you're not good enough. This might be a very obvious thing, but it's easier said than done.

- Who were/are your scientific role models? Can you tell us what inspired you and what you learned from them?

This is another tough question, but let me put it this way. As I mentioned, I grew up in a farm, in a very isolated place in the Alps. We were so far

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Alba Grassi (UNIGE & CERN)

away from everything that the electric grid didn't even reach our home. So I grew up without television and also we didn't have many books at home. Therefore, growing up I didn't really know much about science and as a consequence, I didn't have scientific role models.

How did I get into physics and mathematics you might ask? Well, as a kid I loved school. So I decided to go to high school. It was sometime in the middle of high school, when I began to develop a preference for math and physics. I don't know why, I guess I just found them more interesting than the other subjects. And in addition to this, I had an amazing professor in high school. He was actually a mathematical physicist. And since I also became a mathematical physicist, you could say, he had an impact on the path I decided to follow.

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So role models were not what got me into mathematics and physics. However, once I chose this path, role models have encouraged me to stay. Knowing that there have been women like Marie Curie or Emmy Noether, who really stood out and made brilliant contributions to science, it has been very important to me as a woman. But in general, already as an undergraduate student, I always found it encouraging to meet strong female scientists on my path. They make science (and academia) look like a more accessible place.

- What has been the greatest challenge you had to face?

I am not sure, there are always many challenges. Work-wise for example, I always found challenging to stay focused and to produce high level results while having to apply for a new job every two or three years.

- What has been so far your favorite moment in your career?

I don't have just one singular, favourite moment. For me, research is more a collection of small moments that I get to enjoy on a daily basis. For example, when I discuss constructively with my colleagues, or when I overcome an obstacle in my research, or when I discover something new. I enjoy all of these. There's not one favourite, but a collection of small moments that happen every day.

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Interviewed by Maria Kondratieva
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