A conversation with

Vincent Tassion

First Winner of the SwissMAP Innovator Prize

Vincent completed his PhD thesis in 2014 under the supervision of Vincent Beffara at the ENS Lyon. He then did a postdoc at the University of Geneva under the supervision of SwissMAP member Hugo Duminil-Copin, which he completed in 2016.

In 2017, he was appointed assistant professor at the ETH Zürich. He received an ERC Starting Grant in 2019, and as of April 2021, he obtained a permanent position at the ETH Zurich as associate professor.

His research interests include percolation theory, probability 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?

I was a postdoc at the time and part of Hugo Duminil-Copin's group. Those two years were probably my most intense years, but it was a wonderful time. We had a very active group and I had a lot of time for my research. I really enjoyed those years and I think there was a particularly good energy and synergy within the group. We also had great relationships with other colleagues. But in particular, I was in close collaboration with Hugo Duminil-Copin and we did some very interesting work.

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

After my two years as a postdoc, I was appointed assistant professor at the ETH in Zurich. I have been here ever since I started in January of 2017, so for four years now. And actually as of April 2021, I received a permanent position here at the ETH Zurich as associate professor.

- Did you keep in touch with people from SwissMAP?

Yes, and quite a lot. I still am in very close collaboration with Hugo Duminil-Copin. We discuss a lot of things. Not just our research, but also things surrounding the academic environment. For example, we coordinate the collaboration between our teams. We also organise events together. At the moment, we are preparing an online conference, and we have projects for future conferences that we would like to organise. I also have many other collaborators within SwissMAP, such as Ioan Manolescu (University of Fribourg) or Juhan Aru (EPFL). Since I am in Zurich, many of my local collaborators are also part of SwissMAP, and we have very good relationships between colleagues.

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

This was quite a natural process for me. I moved from the University of Geneva, to the ETH Zurich, meaning I stayed in Switzerland. And I did not change my research subject. Since both institutions are part of the SwissMAP program, it was a natural choice to be part of SwissMAP once I was appointed assistant professor.

> Generally, in my academic path, I seize the opportunities as they come. And I have found that the best opportunities come naturally, and you are able to grasp them.

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

When you are a student, you do your own research. But when you are a group leader, you have additional tasks to handle. You have to find problems, have good organisation, and create a good dynamic within your group.

I was actually very lucky when I was young. You don't realise it at the time, because you're so focused on your research, but people do a lot of things for you. And when you start to have PhD's and postdocs, you realise how it functions. I am very grateful to the group leaders I had when I was younger, because we had a great group dynamic.

- 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?

I kept a strong collaboration with Hugo Duminil-Copin. There are a lot of other scientists I would like to collaborate with as well. Nevertheless, collaborations should not be forced. They should happen naturally. And I don't bring any intentions into a new collaboration. It's a lot like meeting in real life. I don't like when things are forced and I don't want to feel the pressure that I must collaborate with someone specific on a specific subject. Generally, in my academic path, I seize the opportunities as they come. And I have found that the best opportunities come naturally, and you are able to grasp them. Of course, there are several people I would be happy to collaborate with, and I have a lot of projects in mind. But for the moment, maintaining the collaboration I have and developing our ideas is already a good challenge.

- Can you briefly describe your research?

I'm working in the field of percolation theory. This theory originally stems from physics, but I'm working on the mathematics side of it. The goal of percolation is to describe how a fluid propagates in a random environment. And on the mathematics side of it, this creates a rich number of fascinating questions. Here, I would like to quote Harry Kesten, "Quite apart from the fact that percolation theory had its origin in an honest applied problem, it is a source of fascinating problems of the best kind a mathematician can wish for: problems which are easy to state with a minimum of preparation, but whose solutions are (apparently) difficult and require new methods". Since it requires new methods, it is mathematically very challenging.

And percolation is particularly relevant within SwissMAP, because it has a lot of connections with other models in physics. For example, in the study of spin systems, where percolation models can also be used to describe how information travels between spins. This is particularly pleasant, because you get to have many interactions between various fields.

Vincent Tassion. Shuffling Paper at the XV CLAPEM in Mérida, Mexico.

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

Not really. When I was young, I didn't even know I could go into mathematics. I didn't grow up in an academic environment at all. And actually even when I found out that we could study mathematics, I was not attracted by the academic path. I must say, I don't quite like the idea of big careers and high academics. My interest was only in mathematics and the possibility to do research. But step by step, I discovered an interest in the academics side as well, which came at a later stage. I have now discovered many things that I particularly like about the academic path. For example, collaborating with other researchers, or even sharing knowledge with new generations. These are dimensions I didn't think I would like so much. I thought I was a "mountain goat" who liked to stay up on his mountain. But that has changed a lot since I set on the academic path.

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

There was no single drastic change; things happened step by step. An important moment happened when I was a student and I met Vincent Beffara, who taught me Percolation Theory and later became my PhD adviser. Another big change was when I came to Geneva to work with Hugo Duminil-Copin. I met him during my PhD and it was a really great encounter. I remember that when I came to Geneva, I told Hugo that I would only stay for one year. Back then, I wanted to stay in France. But here I'm am, all these years later, and I'm still in Switzerland.

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

It is actually quite difficult to give general advice, because it depends so much on the persons and their personality. Some advice might be good for one person, but not for someone else. However, two things do come to mind. The first advice I would give, is to always keep an eye on yourself. This might be completely obvious, but you cannot do good research if you are not healthy and happy. You need to keep a good balance between the things that are important for you. In my case, for example, if I forget to go to the mountains, I get dried out and I can't do mathematics. It is sometimes tempting to say that you will work like crazy for some time, but then you forget about things that are completely essential to life. Primarily essential like, family, health, hobbies and so on. Especially nowadays, research has become so competitive, so intense, it's easy to forget about the other things that also matter. This is a crucial point.

The second advice I would give, has to do with this fact that we are in a competitive environment. It is to never forget to pay attention to the people around you - your colleagues, postdocs, students.. etc. It is better to advance together with other people, instead of fighting to make a space for yourself. Take care of your colleagues and academic friends and take an interest in them. It is always better to not be too self-centred. That is why the group I was in during my postdoc in Geneva worked so well together. We took interest in each other and advanced together as a group. It really is an essential point nowadays.

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

I have several role models. They are all people at very different stages in their careers, but they maintain a strong passion for mathematics. These people are driven by this passion and are truly beautiful researchers.

I have also been inspired by their generosity. They have this very strong global vision and they build an environment around it. But they build it in a way, that other people can join, especially the younger generation. They build a vision and are able to share it. I find these two strong components very inspiring.
As for what I learned from them. Well, I would say, everything.

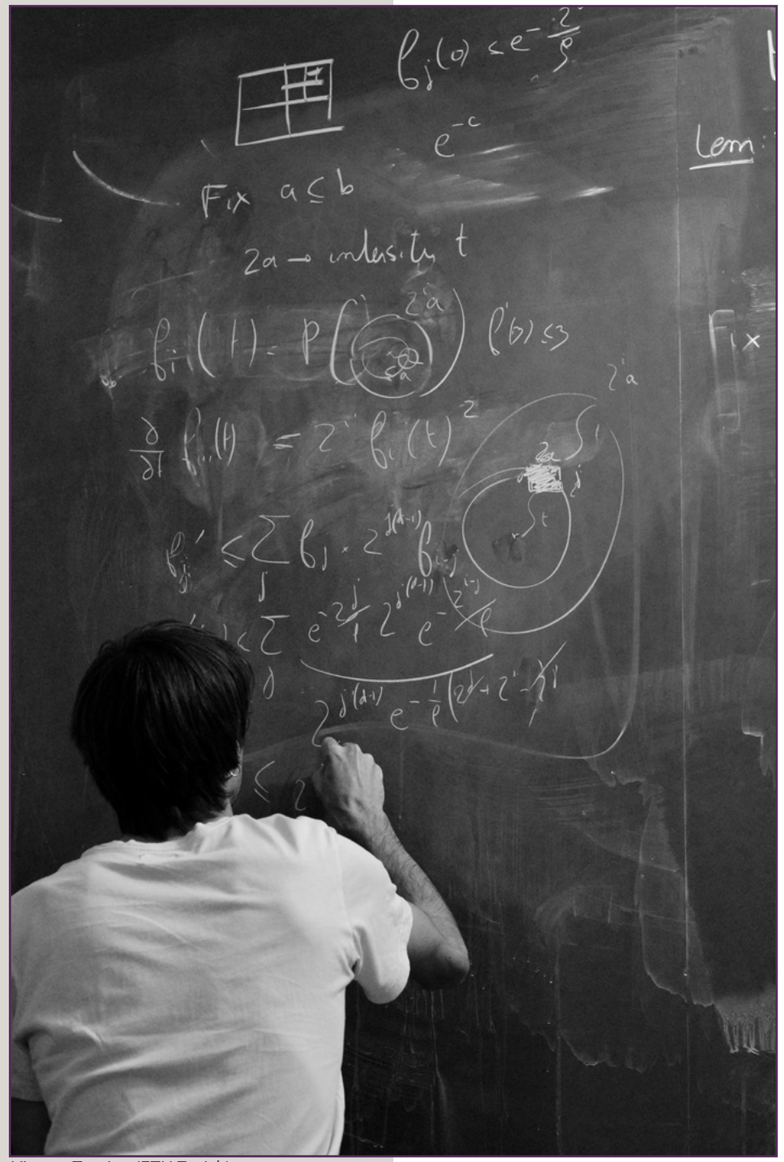
- What has been the greatest challenge you had to face?

The greatest challenges we face are definitely the mathematics problems we are trying to solve. But these are the best challenges and the best feeling – when you have a problem, and you want to solve it. So the biggest challenges, are the math problems that are not easy to solve. But the reward is great afterwards.
On a more personal note, one challenge for me, is to find balance in the workplace. I would like to find balance between having time for research, and being able to respond to my other obligations. Another challenge I face, is that I am a perfectionist. There is always a large amount of tasks that have to be done, and not necessarily perfectly. They just need to be accomplished. For me, this is challenging.

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

I have two moments that come to mind straight away. The first one, was when I was in Geneva with Hugo Duminil-Copin. One day, we were discussing something as we usually did every day. But this day we suddenly found a proof for something that we were not actively working on. I still remember how surprised we were and that we couldn't really believe it. I was supposed to take the train to Lyon that day, and I missed my train. I wanted to stay to check that the proof was correct and of course, to share the moment with Hugo. We were jumping in our office from happiness. I remember it so well, because of our surprise at the time, and how it was a very intense moment in our friendship and collaboration with Hugo. It is a really good memory.

The other moment that comes to mind, happened recently. There is one problem that I have been thinking about since I know percolation, since I pretty much began to do probability. I have been thinking about it for more than 10 years now. And together with my PhD student we solved this problem last year. This was also a very intense moment. At first, we didn't have the proof yet. But we knew we had the argument and that it would be solved. This was also a memorable moment in my career.



Vincent Tassion (ETH Zurich)

These two moments do have something in common. They are moments when you discover something, and you discover it with someone who is able to share the intensity of the moment.

This might be completely obvious, but you cannot do good research if you are not healthy and happy. You need to keep a good balance between the things that are important for you.

Conversation with Vincent Tassion
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Interviewed by Maria Kondratieva
On behalf of NCCR SwissMAP