



ZALA LENARČIČ:

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Lydia González Orta: Why to choose the quantum field. What/who can provide inspiration

Zala Lenarčič: The story goes long back to my studies. The first lectures on quantum mechanics literally blew my mind. Later, when choosing my PhD topic I knew I wanted to work with quantum mechanics but I was fascinated by both high energy and condensed matter physics. I chose the latter and I don't regret it because I believe this field is close to a new revolution and will be of relevance for technology in the near future.

L.G.O: The reasons to take part in the QuantERA call

Z.L.: I think we are living in exciting times when the potential of quantum technologies is starting to be real and QuantERA is an excellent European Programme to facilitate and speed up the progress. The idea of involving various experts into European consortia is magnificent. Imagine how connected Europe's map would be if we placed all those links on it! I believe it is a great opportunity for European science and technology, therefore I would really love to be part of that action.

I must say that to me, a relatively young researcher who has just started to form a research team in Slovenia, QuantERA ensures finances allowing me to extend my research group even further. Furthermore, PhD holders and postdocs working in my team have an opportunity to collaborate with other researchers and experimental groups, which is great. Besides, a consortium incorporating experts that complement each other definitely broadens one's expertise in a synergetic way.

L.G.O: The contents of the funded research project for non-specialised audiences: impacts on technology and society

Z.L.: The project lead by me is about setting up a new experimental platform that will push the field of quantum simulation forward.

Cavity quantum electrodynamics in which atoms strongly interact with light confined between two highly reflecting mirrors, is the major platform in use today to harness quantum atom-light interactions. In such systems, the possibility for excited atoms to emit light in directions beyond, what can be captured by the mirrors, creates a loss of information that limits our level of control. Furthermore, it is commonly thought that such emission is an unavoidable property. Here, we will build a new cavity platform capable of positioning atoms at sufficiently short distances, that their emission into unwanted directions would be strongly suppressed by destructive interference.

The ability to hide the quantum nature of this system from unwanted dissipation should give rise to a powerful new platform for future applications in quantum simulation, computation, and metrology.

The experimental advance we propose combines some well-known ingredients but will be unique worldwide. What's more, it will also allow us to control and engineer the dissipation to explore new quantum phenomena. While we are intending to address more fundamental questions, also theoretically, we hope to be ready to present the potential to the interested industrial partners by the end of the programme.

L.G.O: The role of coordinator: opportunities, challenges and gender issues

Z.L.: As I said, I am quite young and this is my first time in this role. I was a bit doubtful at the beginning as to whether I could manage the position but I managed to get some confidence when coordinating the drafting of the proposal as things ran smoothly.

The communication with partners was also good. Now, I am quite confident that I can lead the project successfully. I expect that the first consortia leadership will allow me to gain valuable experiences and be crucial to my career in the future.

You asked me, who are my role models in terms of coordination... I believe coordination tends to be more management than research work as such. My actual role models, on the other hand, are mostly scientists with whom I have worked and who have shaped my physics style. Nonetheless, I think I have been exposed to different managing styles so I know which mistakes I should avoid.

Regarding the gender issues: we have six nodes on the project, six PIs, and two co-PIs with me being the only female PI. We anticipate that with the PhDs and postdocs the consortium will be more balanced. A few female PhDs and postdocs from the PI's groups have already been involved. One thing we said we would try to push forward in our institutions is to create a more family friendly environment, e.g., family rooms

to help researchers combine their professional and parenting tasks.

I believe that it is difficult to combine family and professional life which is why there are less female scientists. Therefore, we are trying to make a change here. A change that others could profit from, too. I know that our two PIs have small kids and I will myself make an effort to make the communication and activities adjusted to them.

L.G.O: The main challenges for more gender balance in the quantum field: QuantERA first steps, promising measures, the most popular topics in the community's discussions

Z.L.: I find the attempts to “brute-force gender-balance” our community quite delicate. I am afraid that a few years from now, most of female achievements might be questioned and appear as gifted within a “gender balance action”. For example, even though this is probably not the case, I have already started to doubt my own successes. I really believe that quality should always be the first criterium in hiring and evaluation processes, while gender-balanced

preferences should be allowed only when, for example, two equally good candidates, proposals, etc., are considered. I will encourage this type of decision-making process within our consortium.

Anyway, I think the pattern is changing: I have a female PhD student and a female postdoc, so women form more than half of my group! Also, the number of female students in the condensed matter field is increasing slowly but steadily. For some reason, it is happening. I actually believe that we should promote science and scientific thinking to kids and girls in kindergartens, schools, high schools. This is how we can really change the pattern, not by forcing hiring female PhD students.

An obstacle that I see in choosing a research profession is a long time before one gets a stable (permanent) position. This is a problem for everyone but especially for women wishing to have a family. Finishing a PhD, one, two postdocs, then applying for positions worldwide and coordinating it with your partner... You are at least 35 by the time you have a (more) stable position! Unfortunately, I have no idea how this

could be changed. The experience you gain from the post-doc time abroad forms you as a researcher and one would never have the same profile without it. Perhaps at least parental leaves should be seriously balanced for in various application processes but some positive changes have already been brought to that area. However, as long as the market stays limited and thus highly competitive, the situation will not probably change as much.

On the QuantERA first steps to contribute to a more gender-balanced field:

QuantERA II encourages the participation of consortia with a fair representation of female researchers both as PIs and in research teams (2021 call)

2021 call peer review guidelines encouraged all panel members to recognise and challenge “unconscious bias”

Gender Equality Statement as Annex II of the 2021 call recognised the key role of RFOs while calling on physics institutes and the physics community to:

- Create a gender-sensitive environment and organisational culture
- Create an equality standard regarding the management structure
- Acknowledge that diversity is beneficial for science
- Encourage all female PhDs in physics and in QTs and provide them with adequate career support
- Acquaint STEM students with role models of female researchers in QTs

L.G.O: On the first steps taken by QuantERA II to promote gender balance

Z.L.: I do think that promoting female coordinators of QuantERA projects is an important action because having visible role models is encouraging for students and young researchers. Knowing strong figures with recognizable style was always empowering also for me. It made me search my own style.

As a side effect, we might found out that a different style of managing is possible, and honestly, we do need it. By encouraging women to take on the leadership role, we might actually put that idea into practice. And maybe, our community and the communication style within it will change too.

But as I said previously, I believe we should mostly fight for equal standards and against unconscious bias. Diversity will come with that.

L.G.O: On the strategy of these visibility actions targeting women researchers

Z.L.: I guess it would make sense to involve the male coordinators in such actions as well. We shouldn't make female scientists the special 'species' that must be protected or pushed forward. It is better to involve everyone. I remember a comment from the QuantERA webinar where someone asked if science in the proposal still matters at all or is it only about gender balance. We should not get there...

Lydia González Orta is a gender equality practitioner from Spanish Foundation for Science and Technology (FECYT) who supports the QuantERA consortium towards a more gender-balanced quantum field.

Dr. Zala Lenarčič is a condensed matter theorist from Jožef Stefan Institute in Slovenia, working on the interacting quantum matter out of equilibrium.

*A series of interviews with female coordinators of QuantERA co-funded projects is a part of Task 5.4 Towards a more gender balanced quantum field, i.e. "Highlighting the presence of female researchers among the Coordinators of the QuantERA-funded projects in QuantERA communication and PR materials".

