20 Questions with...

Professor Suliana Manley, Winner of 2018 Medal for Light Microscopy

infocus took the opportunity to ask Suliana some quick-fire questions about her career in science and find out what inspires her about microscopy.

Name

Suliana MANLEY.

Company / Institution

Ecole Polytechnique Fédérale de Lausanne (EPFL).

Position

Associate professor of physics and bioengineering.

1. How long have you worked at your current company/institute?

It will be 10 years in July.

2. How do you use microscopy in your work?

Super-resolution fluorescence microscopy is the main method we use in my group, and we use it to image structures and processes in biological systems, that are below the diffraction limit. Super-resolution microscopy methods have become widely used since breakthroughs in their development around 10 years ago. My group also develops new microscopy technologies, aiming to increase the throughput and versatility of super-resolution through automation and now "smart" microscopy.

3. How many years have you been working with this technique?

I started doing super-resolution microscopy in 2006, during my post-doctoral training in Jennifer Lippincott-Schwartz' group. During that time, I had the fortune to collaborate with the groups of Eric Betzig and Harald Hess, who have been instrumental in my career.

4. What have been the biggest advances with this technique over recent years?

I think the biggest advances have been practical ones, which do not make new records for resolution, but allow us to collect better data and do more with the data, for example through inference and averaging. This is what allows the promise of these methods to be realized, by enabling scientific discovery.

5. What other technique do you think has been the biggest revolution in your field?

I think chemical biology tags and new fluorescent labels, which together greatly expand what is possible to measure with fluorescence. For dynamics, which is where living systems reveal many of their mysteries, I think label-free methods such as iSCAT, quantitative phase microscopy, and second-and-third-harmonic generation have a lot to offer on the subcellular level.

6. What technique do you wish had been available when you started your career?

It's probably strange that I develop technologies, since I actually have a nostalgia for the days when designing a very clever experiment with cruder tools was the name of the game.

7. What annoys you most in articles presenting microscopy?

Lack of information that will allow others to reproduce the data, and lack of data: low statistics, and few examples shown. I'm really excited about the open science revolution, because it encourages open data sharing, and finally the infrastructure is emerging to do it.

8. What is your favourite thing about your job?

Being part of a fantastic team of people (my research group and collaborators), who are always teaching me things and moving our focus into the future, in interesting directions.

9. How long have you been involved / been a member of the RMS?

I have had the honor to speak previously at the Microscopy and Microanalysis Congress in 2015, and that was when I became more involved in the RMS community.

10. Where do you see yourself in 10 years' time?

In 10 years, I would like to still be leading a group of about the same size (8-10 people), but I would also like to spend more of my time doing outreach to under-represented communities, and integrating that ethos into my group.

11. Did you have a microscope or science kit as a child?

I did not. I grew up in a volcanic forest in Hawaii, where my parents were tropical flower growers. We were all very involved in gardening and raising chickens, and the beauty of nature had a central focus. But how things worked scientifically was not that much on my radar until I started high school.

12. Who / what has been the biggest influence in your career?

I'm going to mention four, which influenced me at different stages. One, my parents, who endowed me with the ability to find the inner space where creativity and deep thinking can thrive. Two, my high school physics and mathematics teacher (Jerry Bleckel), who showed me the beauty of those subjects and encouraged me. Three, my PhD advisor (David Weitz), who taught me how to be a scientist and nurtured my confidence. Four, my faculty colleague (Kai Johnsson), who mentored me as I built my group and inspired me to be bold with my science.

13. Tell us about your eureka moment

Which one? I think my most important eureka moment was when I realized it doesn't require extraordinary intelligence to generate scientific breakthroughs. This enabled me to see myself as someone who could make important contributions to science. The eureka for my group's work has been realizing that with more and better quality data, one can do much more than simply reduce statistical uncertainty.

14. If you weren't a microscopist, what job would you be doing?

I suppose I would still be a physicist, since I love figuring out how things work. One of the

things I like about microscopy is the table-top instrumentation, and the quick feedback between experiments and results, that allow one to make rapid progress. So I expect I would be doing other kinds of experiment of this flavour, perhaps more with microfluidics or spectroscopy.

15. Do you have an interesting hobby?

Mostly boring ones, like gardening, crafting and doing crossword puzzles. I am like an old person in a relatively young body. I also love the outdoors, and have gradually become comfortable on the snow.

16. I would like more...

Collaboration, and inclusion of diversity of gender and ethnicity on the development side of microscopy, technical fields, and academia in general.

17. I would like less...

Self-promotion and closed doors.

18. What's the most interesting place you've ever been to a conference?

I was at a great conference in Taipei, I enjoyed the differences in culture, cuisine, and architecture. A highlight was visiting the skyscraper Taipei 101, which was engineered to include a pendulum to damp the oscillations of the building during high winds.

19. What is your favourite image?

The scientific illustrations of David Goodsell, which integrate information from biochemistry and imaging to create thought-provoking, realistic visual representations of cells. Also, the animations of Janet Iwasa, which bring to life scientific findings. My favorite image from my own lab is currently the 3D reconstruction of multiple centriolar proteins by Christian Sieben, a fantastic postdoctoral researcher.

20. Why is this your favourite image?

These examples are quantitative, beautiful, and give insight into processes of living systems.

21. If you could have any superpower what would it be?

Teleportation, so that I could spend more time with the people I love.

22. What's the most important lesson you've learnt in your career?

Many things that seem like talents are learned skills, which we can master through practice and the advice of a good network of mentors and peers.

23. Where would we find you on a Sunday afternoon?

Somewhere outside with my husband and two children: hiking, skiing, biking, or eating ice cream in the park.