



**INTERNATIONAL
DAY OF WOMEN
AND GIRLS IN
SCIENCE**

**Q&A WITH DR.
MELISSA
STERRY**



MELISSA STERRY, PHD IS A DESIGN SCIENTIST, SYSTEMS THEORIST, BIOFUTURIST, FOUNDER, DESIGNER, SPEAKER AND WRITER.

One of the world's most high profile futurists, Melissa consults to both executive-level private and public sector clients globally. Specialising in futures in the built environment, utilities, manufacturing, engineering, design, publishing, media and communications, she has contributed to groundbreaking projects and publications as far and wide as the United States, South and South East Asia, UK, and Europe.

Regularly featured throughout the media, Melissa is published in over sixty international trade, consumer and academic titles. Past assignments include featured expert and media figurehead in Interface's 'Beautiful Thinking' campaign; technology figurehead for The Guardian's 'The Future Designed Around You' supplement, sponsored by Volvo; in conversation on future cities with Neil deGrasse Tyson for Star Talk radio; and presenting 'Leonardo's City' for BBC Radio 4.

Since 2010, Melissa has conducted transdisciplinary research into the potential for building urban and peri-urban resilience to major meteorological, geological, and ecological disruptions through the mimicry of the biochemistries, behaviours, relationships and systems of flora and fauna, and the assemblages the form. Outputs include her PhD, which completed at the Advanced Virtual and Technological Architecture Research [AVATAR] group in London, posits a radical new architectural and urban design paradigm for the wildland urban interface. Her thesis and its legacy research and publishing works are shared through digital open access project Panarchic Codex® [est. 2018].

Melissa is the founder/director of London-based biofuturism consultancy Bioratorium® [Est. 2019], its lab Laboratorium®, and of Bionic City® [Est. 2010], which asking "how would nature design a city?", explores the potential of biodesign, biomimetics, and biotechnology in the built environments of the now, near and far future. Developing original research, concepts and creative works, Bionic City® has attracted a global community of interest and has collaboration and co-creation partners across multiple cutting-edge disciplines worldwide. Her earliest interrogations dating to the early 90s, Melissa has 25+ years experience in researching and developing original biomaterial, bioinformatic, and bioinspired concepts in textiles, fashion, architecture, construction, urban planning, and infrastructure (melissasterry.com).



HOW DID YOU BEGIN YOUR CAREER, AND WHAT ADVICE WOULD YOU GIVE TO OTHER WOMEN TRYING TO ENTER THE FIELD?

The origins of my career as a scientist don't originate in science, but in design. My interest in the science of design systems – in how, where and why we choose to source materials and to design, engineer, and produce things – emerged from concerns over resource shortages, biodiversity and virgin habitat loss, and climate change. Having taken an interest in these issues since childhood – since the 80s, by the time I was studying for my first degree in the 90s I had realised that addressing these issues required a fundamental shift in design research and practice. Though the concepts I was working with had yet to become established, those concepts, which included what went on to become known as circular design and biomaterials, were clearly compelling creatively as well as environmentally and ethically. These ideas were so radical back then that it was clear that it would take many years for them to enter into mainstream design research and practice, and in the process afford an income from their exploration. Consequently, though continuing to research the possibilities that nature-inspired design presented out of office hours, for many years I focused my professional activities in other innovation fields from which I could derive an income, and in particular digital.

By the time I'd reached my mid-thirties, disciplines like biodesign and biomimetics had gained enough interest for me to conclude it finally possible to centre my professional activities around them. Though working with design problems, it was clear that only scientific and wider STEM methodologies would enable a robust interrogation of the sort of questions I wanted to answer. However, having reviewed what funded PhDs were available, I couldn't find anything that came close to the programme I wanted to undertake, so I designed my own research questions and personally funded my programme. The only way I could do this was to undertake the PhD part-time while holding down commercial assignments. Consequently, though doing a PhD is typically tough, my experience was particularly so, as I was simultaneously meeting the demands of academia and of corporate clients. It wasn't just holidays that went out the window, but time off more generally. Some weeks the hours were extreme, but that's a situation that many a PhD that's juggling commercial commitments and academia will understand well. I don't recommend it, and advise anyone looking to undertake postgraduate research to try to find grant or other funding if you can. But, if you can't, be that because no-one has yet created the programme of research you want to explore, or something else, know that for all the downsides of part-time study, one upside of self-funding your research is that it can give you more flexibility in what you do. Ultimately, there is no right or wrong way to approach post-graduate study and research more generally, but there most definitely will be an approach that is right for you.



DID YOU FACE ANY OBSTACLES DURING YOUR EDUCATION AS A WOMAN IN STEM?

Not that I'm aware of. However, the statistics that women in STEM face more generally are concerning. Those statistics make clear that women are still less likely to be promoted than men in STEM. They also make clear that women are likely to be paid less for doing the same job / having the same level of experience, and by some way. Adding further insult to inequality injury, women are less likely to be published – be that in academic journals or in print more generally, less likely to have their work recognised by both peers and public alike, and they are still less likely to be invited to speak on their areas of expertise at events and in the media. Make no mistake about it, inequality remains rampant in STEM.

Which begs the question of how to address the issue? Though I haven't experienced inequality as a researcher, I witnessed inequality countless times earlier on in my career. It's expression ranged from experiencing clear gender bias when pitching for investment and grants for innovation projects to jaw-droppingly sexist comments made by male executives in meetings to – the icing on the gender inequality cake, a leading corporate that will remain nameless trying to headhunt me, to then make an offer for which the salary they suggested was just 25% of the commercial rate for my level of experience. Thankfully, I've always had the confidence and the wider circumstances to walk away from inequality. I've also been fast enough in my thinking to meet countless sexist remarks with dry wit of the withering kind. However, I am acutely aware that many women have less autonomy to meet inequality and sexism head on. Many female peers of recent and past times have confided in me about issues they've faced. I've been appalled at some of the things I've heard. On the one hand, many of the problems faced by women and girls in STEM around the world are shared. However, national and regional issues have a bearing on the extent to which they are able to address those issues. However, regardless of where they are, women and girls everywhere have much to gain from the mutual support offered by their peers overseas. Though it's not in our power to instigate such things as policy changes, we can give practical advice, we can use our agency to help from afar, and above all, we can encourage our female counterparts to keep challenging inequality when, where, and how they can. We can also raise the profile of our women and girl peers, and in doing so help increase their agency to make change.



WHY IS IT IMPORTANT TO ADVOCATE FOR MORE WOMEN IN STEM?

The many and serious problems we see all around us are not accidental. They instead came about because of flaws in how we design, how we make, and how we maintain the various systems we rely on to live and to work. We rarely find that problems were born of intent. More usually problems arise because someone, somewhere, or perhaps many people, in many places, didn't see an issue at the design stage, whether that stage was in policy making, production, or other. The built world we see around us today was largely created based on decisions made by men, be those men the ones that sat on the boards of the companies that made this or that thing, or the men that wrote, legislated, and thereon upheld this or that policy, or that chose to fund this idea over that idea. That men made most of the decisions that led to the strife-ridden world of present is evidenced in countless statistics, including but not limited to the gender ratio on executive boards to the vastly lower extent to which women-founded start-ups and other ventures attract investment compared to those founded by men and more. In the eyes of some the solutions to the problems largely male led decisions led to are best solved by men.

If the inequality that led us to where we are now continues it would be naïve at best to imagine the many problems – huge and fast unfolding problems – that need solving will be within the timeframe to hand. We need, and urgently, our collective approach to problem solving to become radically more efficient, more reliable, and more effective. We can only do this if women are co-leading the process of change, as opposed to being relegated to second place. While many fields are imperative to addressing the problems of the world, STEM is foremost, because scientific information – data, together with discoveries born from that data, and applications catalysed by that data, are what can empower us to make the most informed decisions possible. Essentially, science needs to be front and centre in our decision making. Wider STEM is what can enable us to utilise the power of scientific knowledge craft the solutions we need now and in the future.

Whether or not the female and male brains do or don't work differently, as a woman that has worked with many male executives, my experience has shown me that there are significant differences in how many women approach problems to how many men do. More specifically, in my experience, women tend to be less gun-ho in their approach to tackling problems and are typically more reflective. This may be one reason why some recent studies have suggested that women-led start-ups are less likely to fail than male-led start-ups. But, regardless of the extent to which women do or don't enhance the commercial prospects of a new venture, their experience of many issues is inherently different – and, of course, they make up roughly half of the world's population. Their presence on everything from executive boards in and beyond STEM, to how much funding their research and other works attract should reflect that fact – they should have their fair share, but they don't now.

DO YOU HAVE ANY STANDOUT MOMENTS OR PROJECTS YOU ARE EXCITED ABOUT?

I'm always excited about several projects, both my own and the works of others. There are too many to mention here, but most of the things I'm most excited about now are in the general domain of biofutures - of solving human problems by applying solutions nature's already found. My three primary research projects revolve around this approach, from exploring how humanity might coexist with wildfires in the near and far future through the Panarchic Codex® project to answering the question 'how would nature design a city' through Bionic City® project to helping companies and other organisations find solutions to their problems through biofuturism consultancy Bioratorium®. One of the most recent biofutures explorations I've created is a series of conversations hosted on Instagram Live. Bringing together peers in the field, these sessions are a place where we can share some of the thoughts and ideas we don't have enough space to share elsewhere. Open to all, the series kicked off with a conversation between Professor Claudia Pasquero and PhD candidate Maria Kuptsova and I in which we discussed how the bio-fields are shaping our built environment future. Women scientists that will be joining us later in the series include Professor Rachel Armstrong. We hope that in taking our ideas to Instagram we can help the next generation of researchers to understand more about our work and about the opportunities at the interface of biological, ecological, and human systems.

