



Beyond the wall beyond the stars

Cristiane de Morais Smith is a born pioneer. Flanked by her parrot Yara, she explores the boundaries of reality. Perhaps unexpectedly, Picasso's brush strokes touch her physics heart more deeply than Newton's formulas.

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Photo: Bram Belloni

When she was little, Cristiane de Morais Smith was gifted unsolved mysteries by her parents, rather than hard facts. She remembers one night when she was a young girl, when her father took her outside. He pointed up, to the brilliant starry sky that, every night, made their village of Paraguaçu Paulista seem even smaller than it already was. 'Cristiane, what do you think lies beyond those stars?' he asked her. 'I think... more stars, *papai!*' 'And beyond that? 'Even more stars.' 'What about behind those stars?' 'Maybe... a big wall?' 'Ah. And beyond that big wall beyond the stars?' Silently, father and daughter continued to stare upward.

Such moments strengthened the Brazilian village girl's conviction not to keep the large wings of her curiosity hidden, but to spread them fully. She still believes a boundless universe deserves a boundless spirit of discovery. So, she will never fold her wings.

On the bathroom floor

She wasn't called to physics specifically until years later, at age thirteen. A teacher presented her class with a difficult task: calculate the acceleration of objects sliding down a slope without friction. Indeed: Galileo's famous experiment. The teacher enjoyed having his class struggle with this problem, only to surprise them with the counter-intuitive insight that mass has no effect on acceleration.

De Morais Smith can still recall the scene: 'He came to check at my table and suddenly he cried out with joy. All the students looked up in bewilderment, because we knew him to be a very subdued man. He appeared to be over the moon because I had already written down the right equations. I asked him if I could solve more fun puzzles like this. "Then you should become a physicist," he responded.'

'I'm attracted to all phenomena on the edge of the unknown and otherworldly'

From then on, that was her destiny. But, for a long time, the road there seemed to be blocked. 'The Brazilian school system is perverse,' sighs De Morais Smith. 'If you want to study at the university, you have to pass extremely difficult entrance exams. Only students from expensive private schools stand a chance. But I wanted it very, very much.'

She knew what she had to do. 'I knew no boundaries. As long as my body didn't give up, I continued to learn.' Sixteen hours a day. For months. Often at night she would lie on the cold bathroom floor with her textbooks, fighting sleep to keep her dreams alive.

Strange behaviour

'If a path doesn't already exist, I'll create one myself.' That attitude got De Morais Smith to Switzerland as a young twenty-something, for a PhD in theoretical physics. For a long time, she had fantasised about Europe. How different would life be there?

She found that out soon enough. 'Before my first symposium, my professor called me over and said: "You are a woman. So, during your presentation, I don't want you to smile; it distracts the scientists here. I want you to dress simply and act seriously. Be modest. Just like a man." To say such a thing to a Brazilian woman is like denying her right to exist. I responded by saying I would never stop smiling. My smile is my ally, in good moments and bad. He accepted my point of view. Or he probably thought: "Never mind, she's from far away and doesn't understand how things works here." Later, other women in physics told

me that my "strange" behaviour also gave them room to behave more freely. So, it was good for something after all!'

Perfect illustration

Today, De Morais Smith is an award-winning professor of physics at Utrecht University. Her research is difficult to summarise. From her medieval home on Oudegracht, where her Amazon parrot Yara provides a Brazilian touch, she reflects on the mystery of human consciousness. In her lab, she plays with the possibilities of the miracle material graphene. She analyses the curious behaviour of atoms at extremely low temperatures. Behind her desk, she calculates what non-existent materials we need to invent for the quantum era to blossom. 'There is a common thread in my research, I think. I'm attracted to all phenomena that are on the edge of the unknown and otherworldly. I feel little for making existing processes more efficient. I dream of new paths to unexplored and misunderstood parts of our reality.'

Significantly, Pablo Picasso's 'deformed' brushstrokes inspire her more than Newton's formulas. 'Take the woman that Picasso depicts with an eye in the middle of her forehead. Completely wrong, correct? Until you realise that the woman was his lover. And that when you see your lover up close, face to face, she would seem to have an eye on her forehead from that perspective. The perfect illustration of the physics concept that all perspectives are equally real. Isn't that brilliant?'

Harmonious zone

As a member of the Delta ITP Board of Directors, De Morais Smith sees an important mission ahead. 'Many brilliant students leave academia. Why? Because their inner spirit of discovery is overshadowed by increasingly fierce competition and more and more bureaucracy. Through Delta ITP, we can create a harmonious space where we can follow our curiosity wherever it leads us.' Beyond the wall beyond the stars, if possible. ■