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# Women in physics: interview with Tanusri Saha-Dasgupta

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**Tanusri Saha-Dasgupta is a Professor and Director at S.N. Bose National Centre for Basic Sciences, India. Her research focuses on computational condensed matter physics and the study of the optical, electronic, and magnetic properties of materials from first principles. Tanusri has been widely engaged in working groups, meetings, and other activities to promote gender parity in Indian academic institutions.**



Credit: Tanusri Saha-Dasgupta

## Why did you choose to be a physicist?

Since my childhood, I have been interested in science, as my father was carrying out his doctoral research in physics when I was a young girl. When people asked me “what does your father do?” while my friends used to answer, “he goes to the office”, my answer was “he goes to the lab”. My family environment made me very much used to the culture of going to the lab rather than the office, and it fascinated me. While growing

up, I was exposed to different branches of science and chose physics as my career. I was determined to pursue a career in research by the time I was doing my Bachelor of Science at Presidency College in Kolkata.

## What scientific developments are you most excited about?

I am very excited by the recent applications of machine learning to materials informatics. For example, the periodic table has 95 metals of different categories ranging from alkalis to alkaline earth, which can potentially form 4465 pairs. It is experimentally impossible to determine how each pair would behave in forming nanocluster alloys. But computers can be programmed to predict the behaviour of these pairs (and more) through “machine learning”. The machine is taught to recognise patterns by feeding in several patterns with well-defined attributes, and these patterns are in turn used to predict the behaviour of different systems with similar attributes. Thus, machine learning helps in a big way in filtering out possibilities, making the job of an experimentalist far quicker and advancing discovery at an unprecedented rate.

## In your view, what are the issues women are facing in terms of diversity and inclusion in academia? What has been your experience?

The issue is complex and should be analysed from a socio-economic perspective. In India for example, the issues faced by a village girl are very different from those of a girl who grows up in an urban environment. Since I was from an urban background, with my parents in academia, my challenges were far less compared to many others. In that sense, I consider myself lucky. However, the over-protective attitude of my parents arising from the fact that I was a girl child, did cause hindrances. They were very much against me travelling abroad or out of my city, which compelled me to carry my PhD in Kolkata. Later, I had to fight to obtain permission to go abroad for my post-doctoral research. On the other hand, I had full cooperation from my PhD mentor, postdoc mentor, and my husband (who was my co-worker during my PhD) to make my path

smoother. Later in my professional career, I did face adverse and discriminatory situations, but I believe I was strong enough to overcome them.

## If you could change one thing (or two)—what would you change to increase the proportion of women studying physics?

In my view, there should be a bottom-up approach along with the top-down approach taken up by governments. Every child, irrespective of gender, should be given equal opportunity and support by their family. This needs a change in the mind-set of every parent, which is only possible through increased awareness of the issue. Men, in particular, need to be educated and sensitised to this issue. Achieving gender equality is everyone’s responsibility.

## What directions do you think your research should go in?

My present research is already quite broad, cutting at the interface of theory, experiment, synthesis, physics and chemistry, and mineral science, but it should get even more interdisciplinary. I wish to incorporate in my work the more recent developments in computer science, and setting up collaboration with computer scientists and AI specialists.

## Has your gender affected your career in physics?

I do not think my gender has affected me in a substantial way. However, being a minority in the community, I needed to put extra effort to reach the achievements I have today. I had to overcome my shyness (which in my society is considered a “quality” for a woman) to get my voice heard in meetings and conferences. I had to put more effort so that people would take me seriously, whenever decisions had to be taken in an authoritative role.

## Have you engaged in Women in Physics activities yourself, organised or participated in any?

I have recently been engaged in several activities towards women’s representation in physics. From 2018 to 2022 I was part of the Gender in Physics Working Group (GIPWG) of the Indian

Physics Association (IPA), an association aimed at co-ordinating national efforts towards gender parity in the Indian physics-related professions. I organised the Pressing for Progress meeting in 2019. I was a speaker at the Women Scientists conclave in 2019 at the India International Science festival. I authored a chapter on Ethical issues associated with gender bias in the book on Ethics in Science, Education and Governance published by the Indian National Science Academy. I was also involved in organising the Indo-French seminar on Women in Science, a

collaborative effort between CEFIPRA and CNRS, in Paris in 2018. Finally, I authored a chapter in the book *Lilavati's daughters*—a collection of nearly one hundred biographical essays on women scientists of India—published by the Indian Academy of Sciences in 2008.

*This interview was conducted by the editors of Communications Physics.*

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