IT ALL ADDS UP

Attend a symposium led by an all-women group to celebrate World Maths Day

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Why does a herd of reindeer get together in a circle when attacked by wolves? It's hard to believe that this is a question that many mathematicians have deliberated upon and come up with a branch of mathematical analysis known as 'shape optimisation problems'. The branch of mathematics is the focus of Dr Anisa Chorwadwala's work at Indian Institute of Science Education and Research (IISER) in Pune. The goal is to find an optimal shape for an object, based on the purpose of the object. "The questions arise quite naturally from what we see around us. Why are soap bubbles that float in air approximately spherical? Of all geometric objects having a certain property, which ones have the greatest area or volume; and of all objects having a certain property, which ones have the least perimeter or surface area?" says Dr Chorwadwala, mathematician and chair of the mathematics events committee at IISER, Pune.

Chorwadwala is part of a group of women that includes scientists, who will discuss their line of research and its connection to mathematics, at an event titled 'An App Called Math', this week. The celebration is two-fold: World Maths Day and as a buildup to International Women's Day. An all-India survey on higher education conducted by Government of India in 2016–2017 suggests that of the 3335 students who enrolled for PhD in mathematics, 1,908 were men. The gender gap, however, is slowly decreasing, believes Dr Chorwadwala. "My recent visits to a few Indian universities (in both metro and non-metro cities) tell me that the number of women pursuing mathematics, at least up to the master's level, has improved significantly. In fact, in Jalgaon and Kolhapur, more than 80 per cent of m athematics students are women," says Dr Chorwadwala.

There are various theories explaining the skewed ratio. "Parents feel there are options that are less demanding than science or maths, which will simplify

the balancing between family and work to a great extent. I think it could be fear of the unknown. They hesitate to enter a field where they do not see many women," says the mathematician, "As I come from a fairly conservative family, it was definitely challenging for me to pursue higher studies. In my case, mathematics was not a reason for the objection but higher studies was."

The gender ratio is unbalanced especially at the top, according to senior scientist Dr Durba Sengupta of National Chemical Laboratory, who is also part of the all-women symposium on mathematics. Growing up, Dr Sengupta didn't have to look too far for a female role model. Her mother is a physicist. "The gap is closing but very, very slowly," she adds. The central theme of Dr Sengupta's research is the cell membrane that forms the main barrier for the cell to the outside. "I will highlight a few instances of where mathematics comes in, when we try to analyse how cell membranes self-assemble, or how proteins within the membrane associate," she adds. Knowing the details of these processes will help scientists design better therapeutics for diseases as varied as cancer and HIV infection.

The 90-minute event, which will include five speakers, will also bring into focus issues such as climate science, string theory and computational biology. The speakers list includes Dr Neena Joseph Mani and Dr Nabamita Banerjee from IISER (Pune) and Dr Leelavati Narlikar from NCL.

WHERE: Lecture Hall Complex 103, IISER Pune, Dr Homi Bhabha Road, Pashan **WHEN:** March 7, 6 pm onwards **CALL:** 25908000 **ENTRY:** Free

Dr Anisa Chorwadwala (centre in orange), who was the convenor of an event titled 'Young women and mathematics' held at IISER Pune in 2014. Dr Chorwadwala is also part of another all-women group this week alongwith Dr Durba Sengupta of NCL (below)

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