



# Outreach Programs

## THE INSTITUTE OF MATHEMATICAL SCIENCES

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<https://www.imsc.res.in/>



row 1: *Thoongu moonji*, Laburnum,  
Coconut, *Navalmaram*, *Poovarsi*  
row 2: *Murungai*, Badam, Copper pod,  
*Nagalingam*, Neem

## IMSc Outreach Calendar\* 2019–2020

**Vigyan Pratibha Teachers Workshop I** 9th – 11th Sept 2019  
Regional workshop for teachers in the Vigyan Pratibha program

**Enriching Mathematics Education** 28th Sept 2019  
Workshop for high school mathematics teachers

**IMSc Open Day: TBD 2019**  
Day-long program of science talks and activities for school students

**Mathematical topics in Biology** 11th Oct 2019  
Workshop for college students

**கணித கானகம்:** 24th Oct 2019  
Mathematics and science program in Tamil for school children

**College Teachers Workshop:** 25th – 30th Nov 2019  
Workshop for mathematics teachers of engineering colleges

**Vigyan Pratibha Teachers Workshop II** 2nd – 6th Dec 2019  
Regional workshop for teachers in the Vigyan Pratibha program

**Women in Science:** 11th Feb 2020  
Science outreach initiative for girl students as part of the  
UN International Day of Women and Girls in Science

**Science at the Sabha:** 16th Feb 2020  
Talks on science for the general public at the Music Academy

**Summer School Student Workshop:** 12th - 20th May 2020  
Week-long summer science workshop for high school students

**College Teachers Workshop:** 25th – 30th May 2020  
Workshop for mathematics teachers of arts and science colleges

**Facets:** 9th – 10th July 2020  
Mathematics program for college students

\*Dates are tentative We also host other thematic workshops and public lectures  
Watch this site for updates <https://www.imsc.res.in/outreach/>  
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**The Institute of Mathematical Sciences (IMSc)** is dedicated to fundamental research in the broad scientific disciplines of theoretical physics, mathematics, theoretical computer science and computational biology. IMSc outreach activities include various programs that bring students and teachers into direct contact with research scientists. One of our largest initiatives “Science at the Sabha” is an annual event for the general public featuring talks on current scientific research.

### About the cover:

**Pollen grains** on anthers of a flower contain the **male gametes of seed plants**. These are transported to stigmas of flowers by different modes – from wind and water to insects and bats – depending on the species of plant. The pollen can then fertilize ovules to form a seeds.

Pollen grains span a **range of sizes** (6 – 100  $\mu\text{m}$ ). They also come in many **mathematical shapes and arrangements** and can have different surface textures, each of which is characteristic of certain plant families and species. For example, pollen of *all* dicots (like *Navalmaram*) have 3 fold symmetry while monocot pollen (like coconut) has radial symmetry.

Pollen grains are coated with a layer of **Sporopollenin**, an extremely resistant substance. It is so **strong and unreactive** that it can survive for over 500 million years and is seen in **fossil records**. There is evidence that Sporopollenin is a polymer but we don't yet understand entirely what it is made of.

Scientists who study pollen are called **Palynologists**.

The front page shows pollen<sup>§</sup> from a few common **flowering trees** from the IMSc campus (scale bar = 20  $\mu\text{m}$ ). At the top of this page, you can see the flowers that the pollen came from.

Can you guess which pollen on the front cover is from which of the flowers above? The best way to find out is to pick up a flower and look at the pollen under a microscope. Happy pollen seeking!

<sup>§</sup>Pollen images taken using a *Foldscope* with a standard phone camera.