



# Raising a Mathematician Foundation

Regn. No. E/8816 Thane Region  
Registered under Bombay Trust Act, 1950

## THE QUANTUM WONDER

Introduction to Quantum Physics

### Objective |

- Expose the deeper concepts of Quantum Physics, to talented students who are keen on pursuing a career in science or engineering.
- Introduce the various technological applications and philosophical challenges posed by the theory.
- Give them a platform to discover their potential and push their boundaries of thinking.

### Outline |

**Can one object be located in two places at the same time? Is it possible to walk through walls?**

**Can a solid object be tuned to behave like a wave?**

**In the Quantum World, nothing is impossible!**

Quantum objects, which form the building blocks of our world, have mind-boggling and counter-intuitive properties. They have been thoroughly scrutinized in various science experiments for more than six decades; and every time Quantum Physics has been proven right! Today this branch of science plays an important role in our lives. The ability to understand and precisely control the Quantum objects has allowed us to revolutionize technology. The engineering feats such as Electron Microscopes, Quantum dots, Solar cells and Memory Storage Devices are possible due to Quantum Physics.

Because Quantum science is playing a crucial role in shaping humanity's future, it is important for students to be exposed to it at a young age. This exposure will allow them to foresee opportunities in science and technology, both for education and for future careers.

The aim of this workshop **Quantum Wonder** is exactly this. During the workshop students will get to appreciate the logic underlying Quantum Physics and study its applications in modern technologies. Students will also be exposed to the philosophical challenges raised by the theory. We will discuss questions such as 'Is there an absolute reality?' and 'Can the observed exist without an observer?'

This holistic combination of **theory-application-philosophy** makes this workshop a unique learning experience, which are typically not offered in standard science curriculums due to time constraints.

Breaking out of the traditional teaching practice, the students will be taken through a hands-on and discussion-based pedagogy. They will have the opportunity to build their problem-solving, analytical and communications skills.





# Raising a Mathematician Foundation

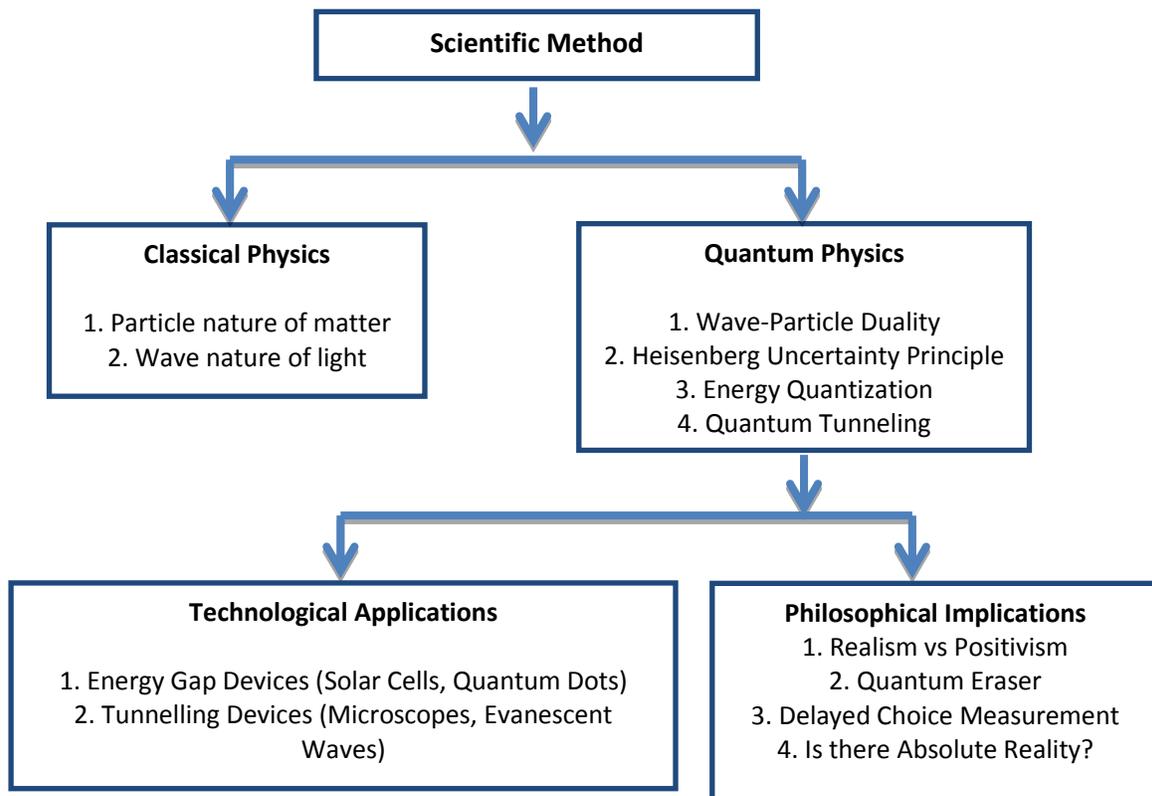
Regn. No. E/8816 Thane Region  
Registered under Bombay Trust Act, 1950

## Workshop Highlights |

- Science underlying the Quantum World.
- Technological and Engineering revolution possible due to Quantum Physics.
- Philosophical challenges posed by Quantum Mechanics.
- Hands-on experience and problem-solving skills.
- Group discussions and Presentation to improve communication skills.

## Key Topics |

### Conceptual Development:



### Skills Development:

- Questioning skills
- Critical Analysis and Reasoning
- Discussion-based Problem Solving
- Presentation of Ideas





# Raising a Mathematician Foundation

Regn. No. E/8816 Thane Region  
Registered under Bombay Trust Act, 1950

## Target Audience |

This workshop is meant for students who are passionate about Physics and are keen to pursue a career in Science or Engineering.

The content of the course will explore topics beyond the standard curriculum; hence participating institutes must select their best students from Grade 10, 11 or 12.

Applicants must have at least either one of the following:

- Exemplary academic performance in Physics/Mathematics
- Keen interest in physics, demonstrated through extra-curricular activities, aptitude tests etc.

## Registration and Fee |

Interested students need to fill in the application form and send it to [raisingamathematician@gmail.com](mailto:raisingamathematician@gmail.com) at the earliest. A maximum of 35 eligible students will be selected who will get the opportunity to attend the program. The workshop fee would be INR 2,000/- per participant. **Only selected candidates need to pay the fee.** Fee once paid, will not be refunded.

## Date, Venue & Timing |

9<sup>th</sup> and 10<sup>th</sup> December 2017

Bal Bharati Public School, Sector 4, Plot no.5, Kharghar, Navi Mumbai, Maharashtra. PIN - 410210

Full-day workshop: Tentative timing 9:30 am – 4:30 pm (Exact timing will be reconfirmed with the selected candidates).

## Faculty |

Hariom Jani (B. Sc. Hons from *National University of Singapore*, NUS) has a background in Physics, and has taught previously at NUS – Physics Dept. He is currently pursuing a Ph.D. under the NGS Scholarship in the field of Material Science and Applied Physics at NUS. In the past, he has lead various scientific research projects at NUS (Singapore) and the renowned institute *Ecole Polytechnique* (France).

Hariom has a strong passion for sharing about physics, its applications and its philosophy. He and a team of researchers have recently been awarded a grant from the Ministry of Education, Singapore (MOE) to develop demonstrations (hands-on and online) to make physics classes more fun and engaging. In the past, he has served as a senior mentor in the *Special Program in Science* and a demonstrator in the *Science Demo Lab*, at NUS. He has also been a jury in the Asian Physics Olympiad - 2014.