

Masterclass at CERN

A Journey in Particle Physics

Take a journey to the largest laboratory in the world with 'Masterclass at CERN'. A collaboration with Life Lab Foundation, the programme allows participants to attend rigorous STEAM classes by leading scientists at CERN, engage in hands-on activities, and soak in Geneva's rich culture and natural beauty. Designed for high school students, the programme includes pre-learning sessions, a week at CERN in Switzerland, and a culminating research project. It fosters scientific inquiry, cultural appreciation, and critical thinking among students.

Programme Highlights

- Three well-defined learning stages: Pre-learning sessions, on-site learning and a culminating research project.
- Direct interaction with CERN scientists and potential mentorship opportunities.
- Networking with fellow participants, fostering collaboration and lasting friendships.
- Cultural immersion via visits to important sites in and around Geneva.

Testimonials



Neil Gutgutia

Grade 9A, Calcutta International School

"I loved the visit to CERN. The masterclasses offered unique insights into Particle Physics and brought us closer to the subject in a way we weren't before."

Twishaa Prabhu

Grade 9, Aditya Birla World Academy

"I am really grateful to have been part of Masterclass at CERN. I can confidently say that the programme has only furthered my love for Physics."



Programme Specifics

- **Dates of visit to Geneva:** Contact us for upcoming batch dates.
- **Batch Size:** 36 (33 students + 3 teachers)
- **Certification:** Participants will receive a certificate from Hearth Academy and Life Lab Foundation.
- **Costing:** The programme cost is INR 2,70,000 (inclusive of GST). The per student cost assumes that a school sends 1 teacher free to accompany every group of 11 students. If a school wants to send additional teachers, this may come at an extra cost.
- **What's included:** The cost includes pre-learning sessions, accommodation, transport to and from the airport in Geneva, meals, travel passes for local travel, activities and tours inside and outside CERN. The cost does not include air tickets, visa, medical insurance or airport transfers in India.
- **Registration:** Please register your interest by filling out this registration form: <https://zfrmz.com/mX4YYubeIM67XV3sPUFA/>, or by contacting us via one of the channels listed below.

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Comprehensive Pre-learning

To help participants make the most of their experience at CERN, we recommend some pre-learning before the trip. Revisiting foundational concepts will not only build a stronger understanding of the topics covered, but also ensure that participants are able to actively engage during the masterclasses. Once you have registered and confirmed your spot, our team will be in touch to share the pre-learning module with you.

Pre-learning topics include:

- *Atomic Physics*
- *Electric and Magnetic fields and their property*
- *Cyclotron*
- *Types of Particle Accelerators*
- *Higgs Field and Higgs Boson*
- *Medical application of CERN findings*
- *Superconductors*

Research Capstone

To wrap up the learning experience, participants will be expected to submit a research project based on their learnings during the programme. Prompts will be provided by us, and students can take up a topic that interests them. Below are examples of prompts from previous editions of the programme:

- *Pick one **cosmological mystery** (like dark energy, inflation of the universe, dark matter) and give a hypothetical explanation for it.*
- *Pick one **particle physics topic** that you learned during Masterclass at CERN. Develop an innovative and interesting lesson plan to teach this topic to a group of Class 10 students.*
- *Assume you have found a previously **undiscovered composite particle** called JUNO. Describe how you might have used data from detectors used to observe proton collisions for your discovery.*

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About CERN

CERN, the European Organization for Nuclear Research, is one of the world's largest and most prestigious centres for scientific research. Established in 1954, it is located near Geneva, Switzerland, and is known for its groundbreaking work in particle physics. The organisation operates the largest and most powerful particle accelerator, the Large Hadron Collider (LHC), where scientists explore the fundamental forces and particles that make up the universe.

About Hearth Academy

Hearth Academy is a pioneering educational platform that transcends traditional learning, offering a unique blend of academic rigour, intellectual exploration, and immersive experiences. We provide a comprehensive suite of educational and academic products and services tailored for students, teachers, parents, institutions, and businesses. The expertise of Hearth Advisors carefully guides all programmes.

Faculty



Dr Archana Sharma is a Principal Scientist at CERN, with over 30 years of pioneering work in high-energy physics. She founded and led the CMS GEM Collaboration, a global project involving 40 institutions across 17 countries, which has yielded over 75 PhDs. She was honoured with the Pravasi Bhartiya Samman, India's highest civilian award for overseas Indians.

Additional Details

- **Certification:** Participants will receive their certificates on successful completion of the culminating research project.
- **Stay in Geneva:** The trip runs from Sunday (arrival) to Saturday (departure). Monday to Thursday is spent at CERN and other research facilities. The last day of the programme is an excursion to explore the natural beauty of the surrounding areas.
- **Cultural Immersion:** Participants will get a chance to immerse themselves in the culture of Switzerland's most cosmopolitan city through guided visits to important sites.