

SOUTH ASIA SCIENCE EDUCATION PROGRAM (SASEP 2025)
DRUK GYALPO'S INSTITUTE, PARO, BHUTAN
1ST JULY – 5TH JULY 2025

The South Asia Science Education Programme (SASEP) was conceptualised in 2020 at CERN with an aim to build a global collaboration platform to discuss futuristic advancements with leading Global Scientists and leaders in the educational landscape by organising thought provoking sessions and discussions to navigate these developments in a manner that is both fun and unconventional. It served as a dynamic platform for educators to exchange ideas, explore best practices, and develop innovative teaching strategies tailored to South Asia's unique educational landscape.

This initiative brought together 78 science educators from across South Asia (India, Bhutan, Mongolia and Israel), with the primary aim of fostering international collaboration, upgrading science teaching methodologies and bridging the gap between cutting-edge scientific research and classroom instruction.

A moment of great honour was the visit by His Majesty, King Jigme Khesar Namgyel Wangchuck, for the inauguration of the Bhutan Baccalaureate on 4th July 2025.

The week long program comprised six modules.

MODULE 1: STEM PEDAGOGY: CONCEPTUAL UNDERSTANDING, INQUIRING, PROBLEM SOLVING, AND CRITICAL THINKING

Led by: Marie-France Labelle Director of Academics, Bishop's College School

This module guided the educators in integrating conceptual frameworks across STEM subject boundaries. Emphasis was placed on the structure of knowledge, inquiry, and key principles of concept-based curriculum design. Teachers were engaged in an experiential learning activity centred on authentic themes and collaboratively designed unit plans featuring conceptual statements and guiding questions.

MODULE 2: PARTICLE PHYSICS IN EARLY STEM EDUCATION

Led by: Dr Archana Sharma, Principal Scientist, Physics Department, CERN & Prof Daniela Bortoletto, Head of Particle Physics, University of Oxford

Elementary particle physics is a fundamental topic in science. This module explored students' existing conceptions of particle physics and guided teachers on how to effectively address these within a model-based curriculum and how best to introduce elementary particle physics in the classroom from an early stage.

MODULE 3: ENHANCING COMPUTATIONAL THINKING IN MATHEMATICS

Led by: Colin Chapman Teacher, Victorian Academy of Teaching and Leadership

Computation serves as a schema for promoting higher order thinking in mathematics. We explored paperfolding proofs, estimation strategies, and Fermi problems to illustrate how computation fosters learning narratives. The session then shifted to hands-on activities

involving the building, calibration, and testing of sensors for science investigations using inexpensive components. These were integrated with Arduino microcontrollers via a voltage divider circuit. We calibrated the sensors using accessible devices and analysed data using spreadsheet tools.

MODULE 4: UNDERSTANDING THE PROCESS OF SCIENCE THROUGH ASTROPHYSICS AND ASTRONOMY

Led by: Joe Wise Visiting Faculty, The Royal Academy

In this workshop, teachers revisited what it means to “know” something in science, using astrophysics and astronomy as lenses. Through hands-on activities, we also learnt how indirect measurements can answer seemingly unanswerable questions. The workshop explored opportunities for global collaboration with citizen scientists, linking classroom practice to real-world inquiry.

MODULE 5: PRINCIPLES OF STEM EDUCATION AS PART OF CLASSROOM PRACTICE

Led by: Daniel Auger, Head of Computer Science & Design Department, École Internationale de Genève

In this module we examined and discussed the value of project and theme based approaches to learning Design, Math and Computer Science and develop ideas for project based learning opportunities. Introduction to Thymio educational robots was given to us and we learned to program and to send code to Thymio and complete a math investigation using the Thymio.

MODULE 6: CERN VIRTUAL VISIT

SASEP 2025 was a truly enriching experience, empowering educators with new perspectives, global connections and innovative tools to redefine science education in South Asia.