

# AUGER INFOCUS

#10, March/April, 2025

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## AUGER INTERNATIONAL MASTERCLASSES

### THE CONCEPT

The first edition of the International Masterclasses on Particle Physics took place in 2005, promoted by the European Organization for Nuclear Research (CERN). Every year since then, this hands-on particle physics program has been bringing together thousands of high-school students worldwide, who become scientists for one day and analyze real data from particle-physics experiments.

The concept is as successful as simple: students take one day off school and spend it, along with their teachers, at a research institute or university. They start the morning by listening directly from scientists what particle physics and its experiments are about. They do not only listen to, but engage in direct conversation and have the opportunity to ask their own curiosities. After a cosy meal for the reestablishment of energies, it is time for the students to work: a computer and a dataset for analysis is all that's needed. By the end of the day, the students join a video conference with their peers elsewhere and scientists at the experiments to discuss the results.

### THE AUGER MEASUREMENT

In 2023, the Pierre Auger Observatory joined the program of international masterclasses, by providing the first activity from an astroparticle physics experiment.

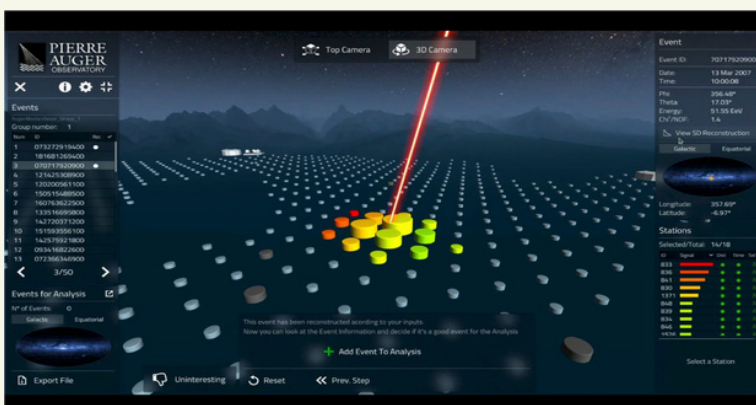


FIGURE 1: INTERFACE FOR THE VISUALIZATION AND ANALYSIS OF EVENTS.

The experience consists in the reconstruction of the arrival direction and energy of events, and in selecting the highest energy ones for producing a sky map of arrival directions and concluding about the origin of such particles. The first edition involved students from Portugal, Italy, Romania, Czech Republic and Algeria. Students from Germany, Ukraine and the USA have also analyzed the data. In 2024, it involved students also from Kenya, Japan, China, Mexico and Hungary. In 2025, students from Bosnia and Herzegovina, Greece and Argentina will participate for the first time.

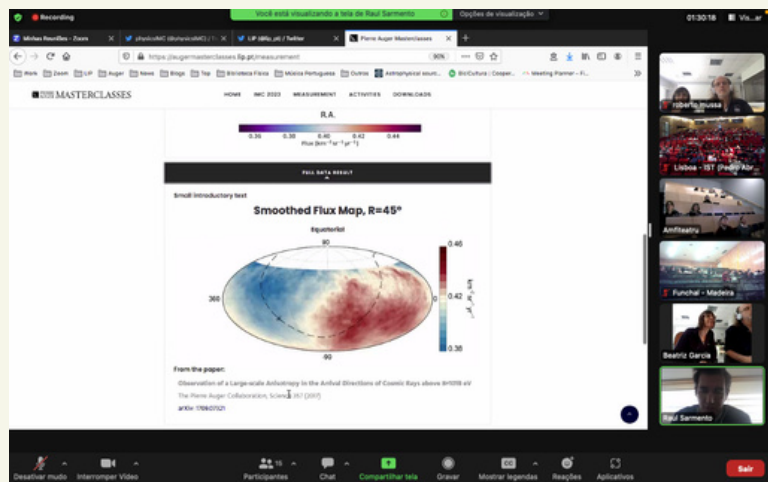


FIG.2: FIRST VIDEO CONFERENCE OF THE AUGER INTERNATIONAL MASTERCLASSES.

### ORGANIZE YOUR OWN ACTIVITY

The proposed activity is based on the analysis of data that the Pierre Auger Collaboration has released to the public.

The data of real particle showers detected at the observatory, together with an interactive tool to explore it, are freely available. Whether you are an individual with interest in studying the most energetic particles in the Universe, or a teacher looking for a new challenge for the students, you may scan the QR code below and start analyzing.



Credit: Raul Sarmento

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