

World Wide Data Day

2018

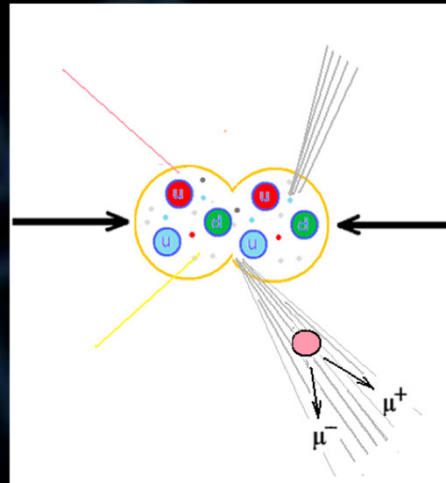


World Wide Data Day

- Introduction to High Energy Physics, structure of the atom, elementary particles
- FermiLab + HYPATIA
- *quarknet.org/content/world-wide-data-day*
- Real data from the ATLAS experiment
- For young high school students
- Videoconference with FermiLab and other schools from all over the world

Particle Production

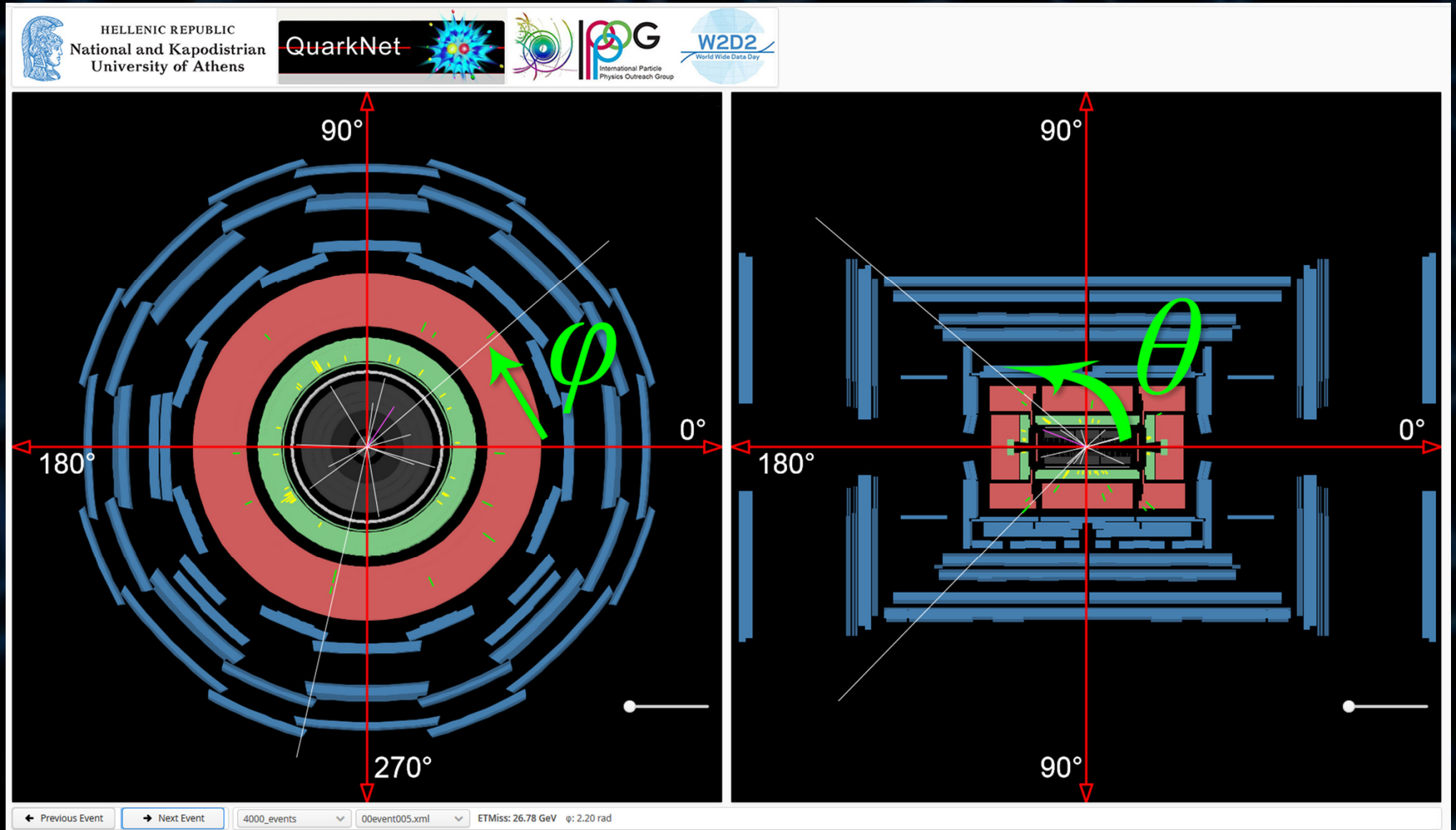
- New particles $E=mc^2$ (13 TeV \rightarrow particles)
- Most are known: background
- Looking for muon pairs (muon – antimuon)



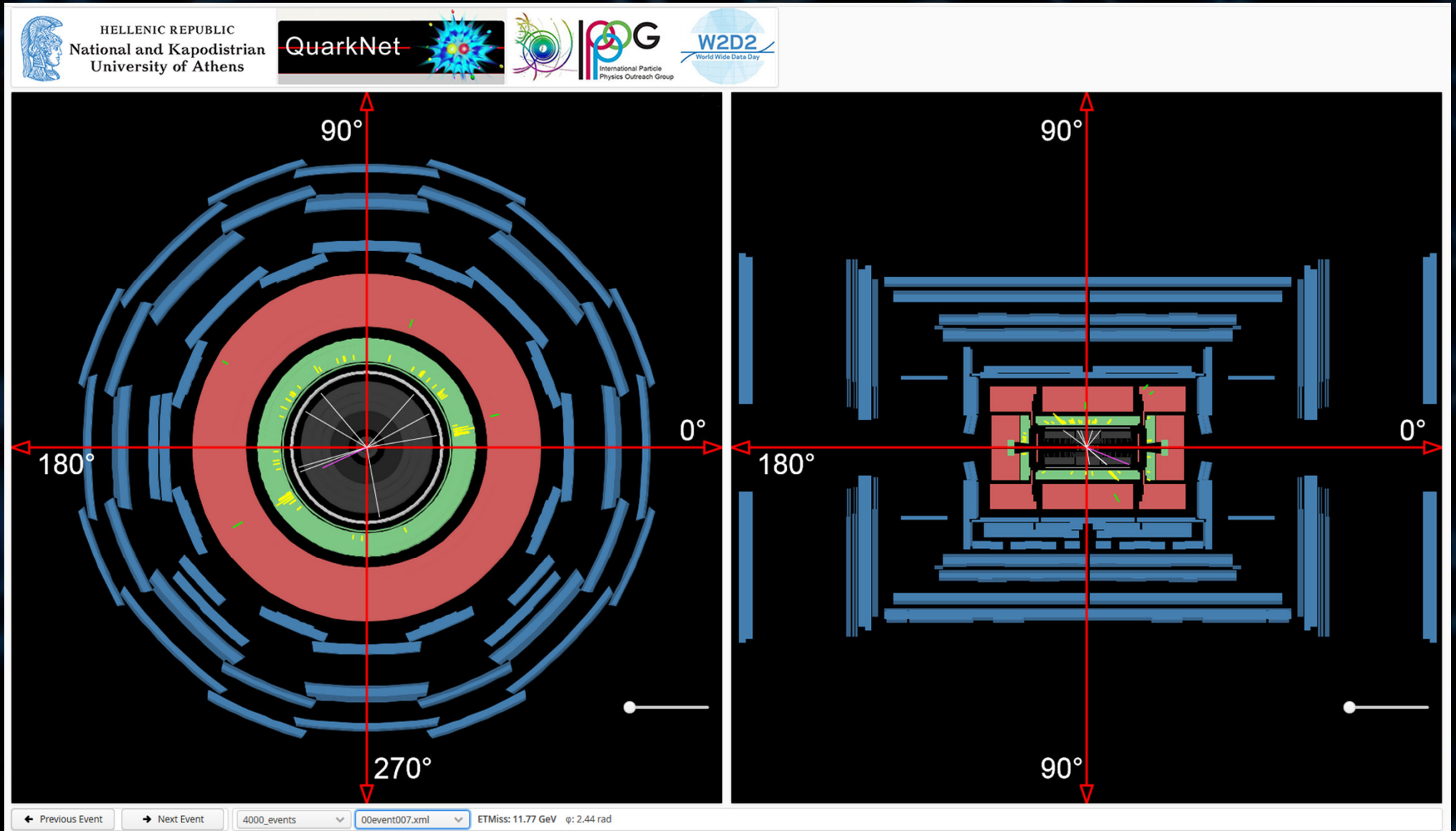
Measurement

- Each pair of students is assigned 50 events. Try to select event groups that are not analyzed by other teams
- Students:
 - Open HYPATIA and browse through the events hypatia.iasa.gr/w2d2
 - In every signal event (containing muon pairs) use a **protractor** to measure θ and φ angles and make histograms of the aggregate values
 - Combine all class results in two histograms

Signal Event

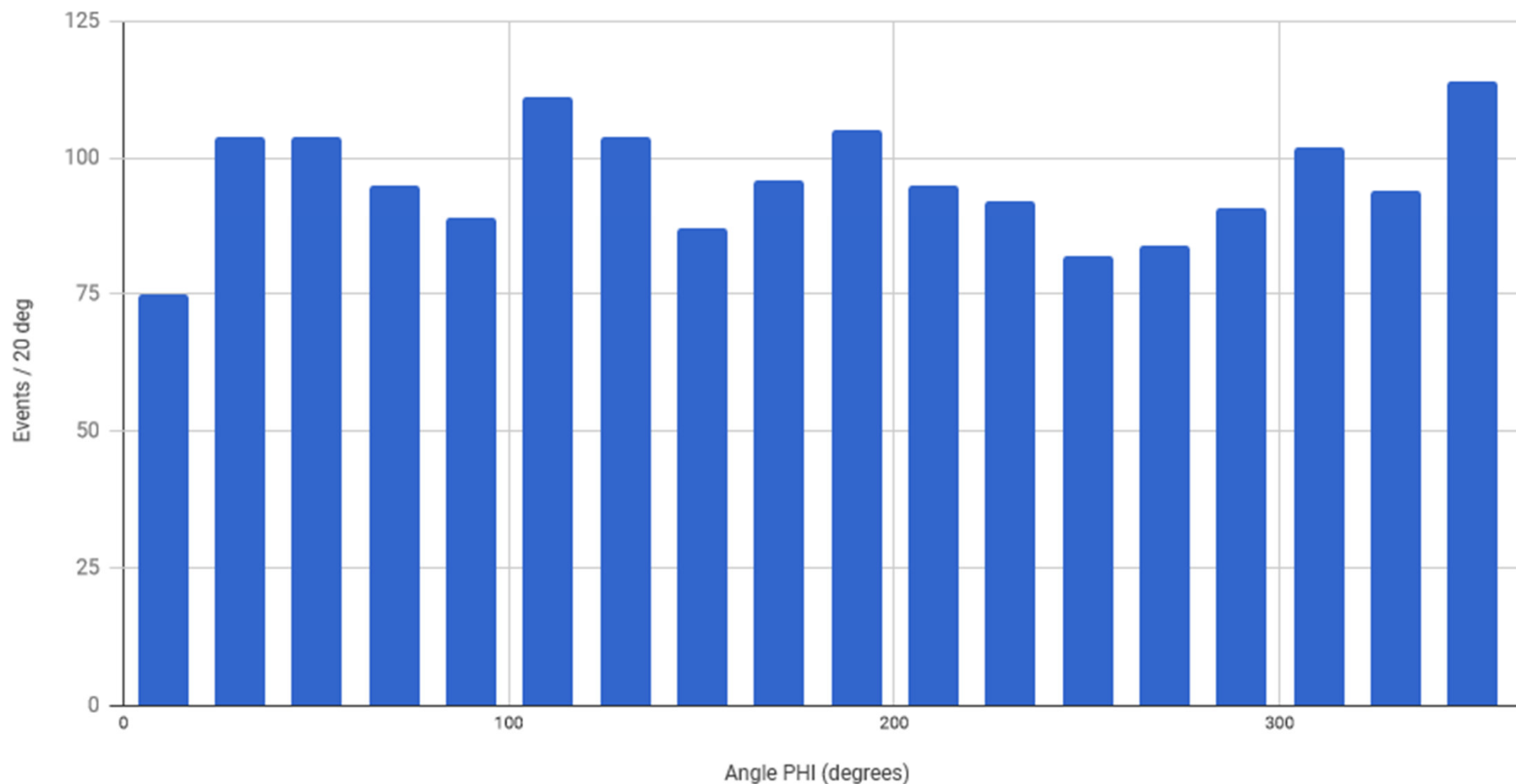


Background Event



ϕ Angular Distribution

ATLAS PHI histogram

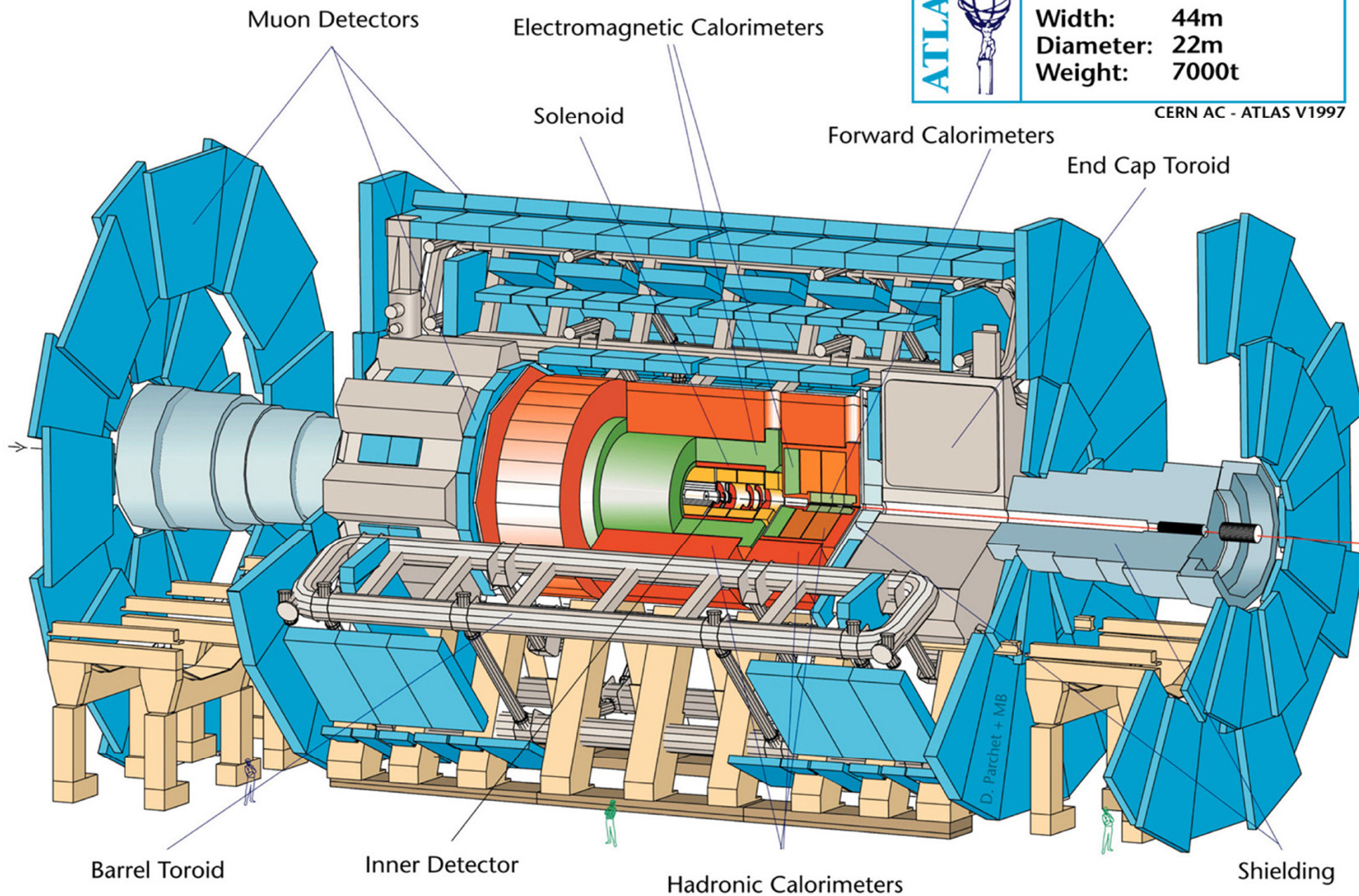




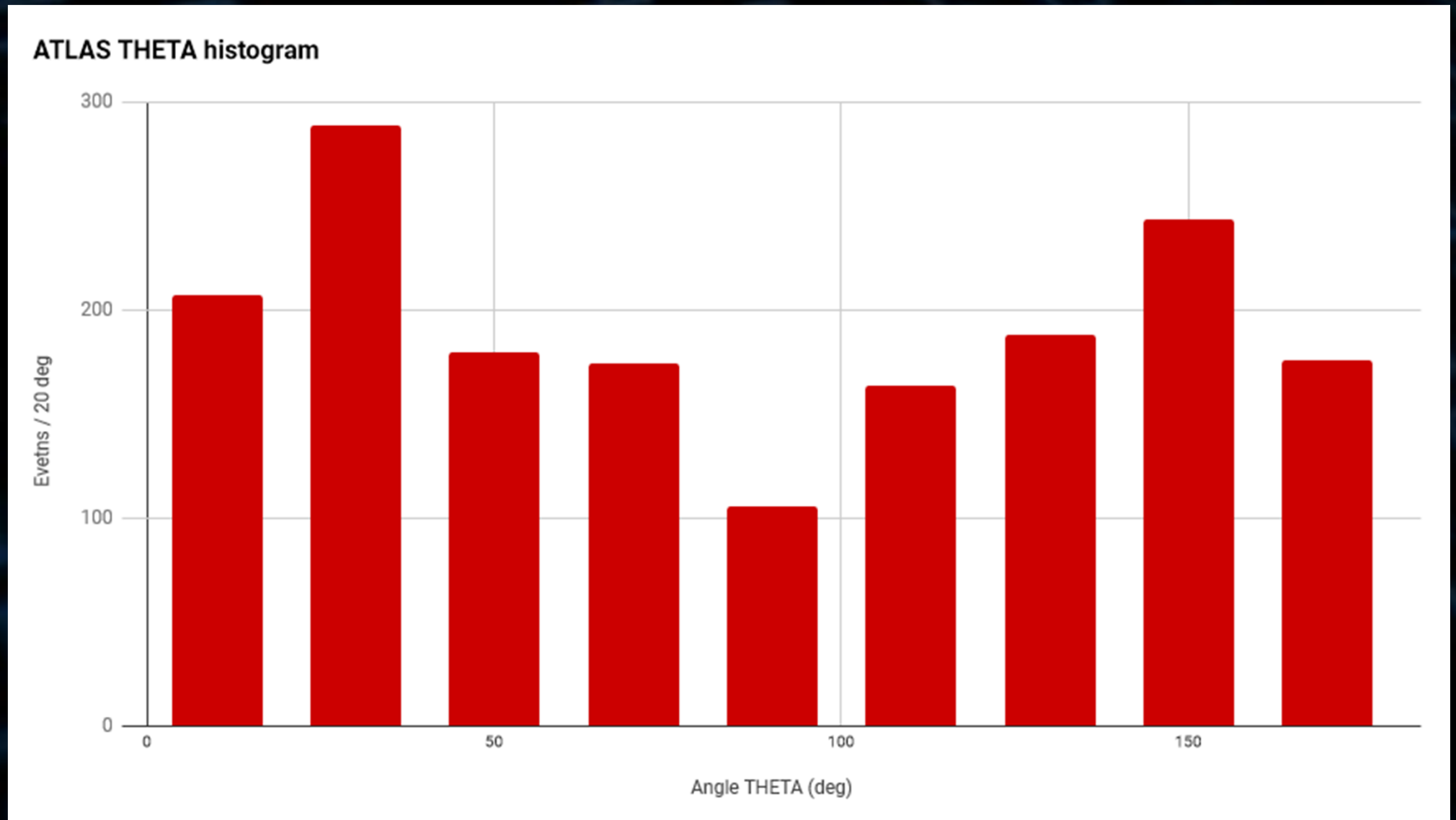
Detector characteristics

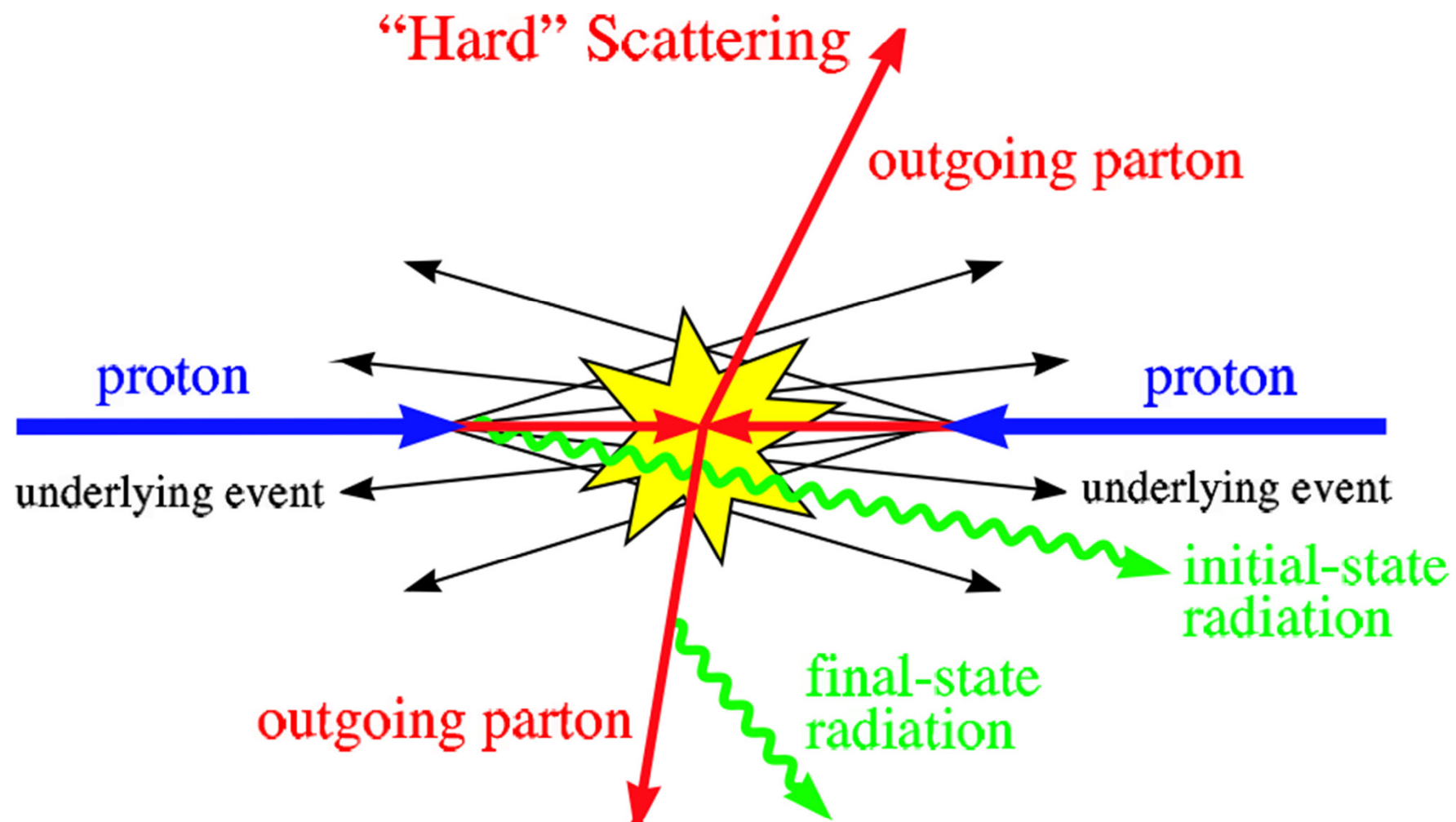
Width: 44m
Diameter: 22m
Weight: 7000t

CERN AC - ATLAS V1997



θ Angular Distribution





Connection with other schools

- You will need a **stable internet connection**, microphone, speakers and a projector
- Connect through **vidyo*** to present your results
- Join the conference with FermiLab and other schools.
The videoconference will last for about **1/2 hour**

Vidyodesktop is used by CERN scientists to communicate. You can download it at:
information-technology.web.cern.ch/services/fe/vidyo