



21st Century Physics in the Classroom



U.S. DEPARTMENT OF
ENERGY | Office of
Science



UNIVERSITY OF
NOTRE DAME



QUARKNET

~5 PI's and
national staff

~50 QuarkNet
centers across
the U.S.

~500 teachers





Supporting Physics Teacher Communities

QuarkNet Centers

QN Staff work with mentors and lead teachers to provide workshop for teachers, masterclasses, and other activities at centers.





Supporting Physics Teacher Communities

National & International Opportunities

Summer Session for Teachers
Data Camp
Coding Camps 1 & 2

HST @ CERN
ITW @ CERN



Resources

Data Activities Portfolio
 Cosmic Ray e-Lab
 CMS e-Lab
 International Masterclasses
 World Wide Data Day
 Partnerships:
 STEP UP
 IRIS-HEP

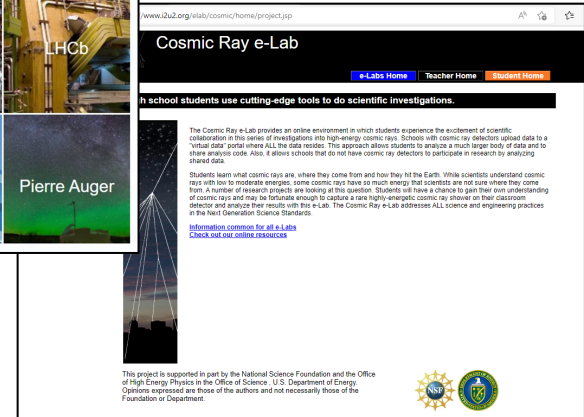


International Masterclasses
 19th International Masterclasses 2023

ATLAS ALICE CMS LHCb
 BELLE II MINERvA Particle Therapy Pierre Auger



Calculate the Z Mass



www.2u2.org/itlab/cosmic/home/project.jsp

Cosmic Ray e-Lab

[e-Labs Home](#) [Teacher Home](#) [Student Home](#)


In school students use cutting-edge tools to do scientific investigations.

The Cosmic Ray e-Lab provides an online environment in which students experience the excitement of scientific collaboration in this series of investigations into high-energy cosmic rays. Schools with cosmic ray detectors upload data to a virtual data portal where ALL the data resides. This approach allows students to engage a much larger body of data and to share analysis code. Also, it allows schools that do not have cosmic ray detectors to participate in research by analyzing shared data.

Students learn what cosmic rays are, where they come from and how they hit the Earth. While scientists understand cosmic rays with low to moderate energies, some cosmic rays have so much energy that scientists are not sure where they come from. A number of research projects are working on this question. Students will have a chance to gain their own understanding of cosmic rays and their ultimate energy by capturing a rare high-energy cosmic ray shower on their classroom detector and analyze their results with this e-Lab. The Cosmic Ray e-Lab addresses ALL science and engineering practices in the Next Generation Science Standards.

[Information common for all e-Labs](#)
[Check out our OTHER resources](#)

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Centers in our area

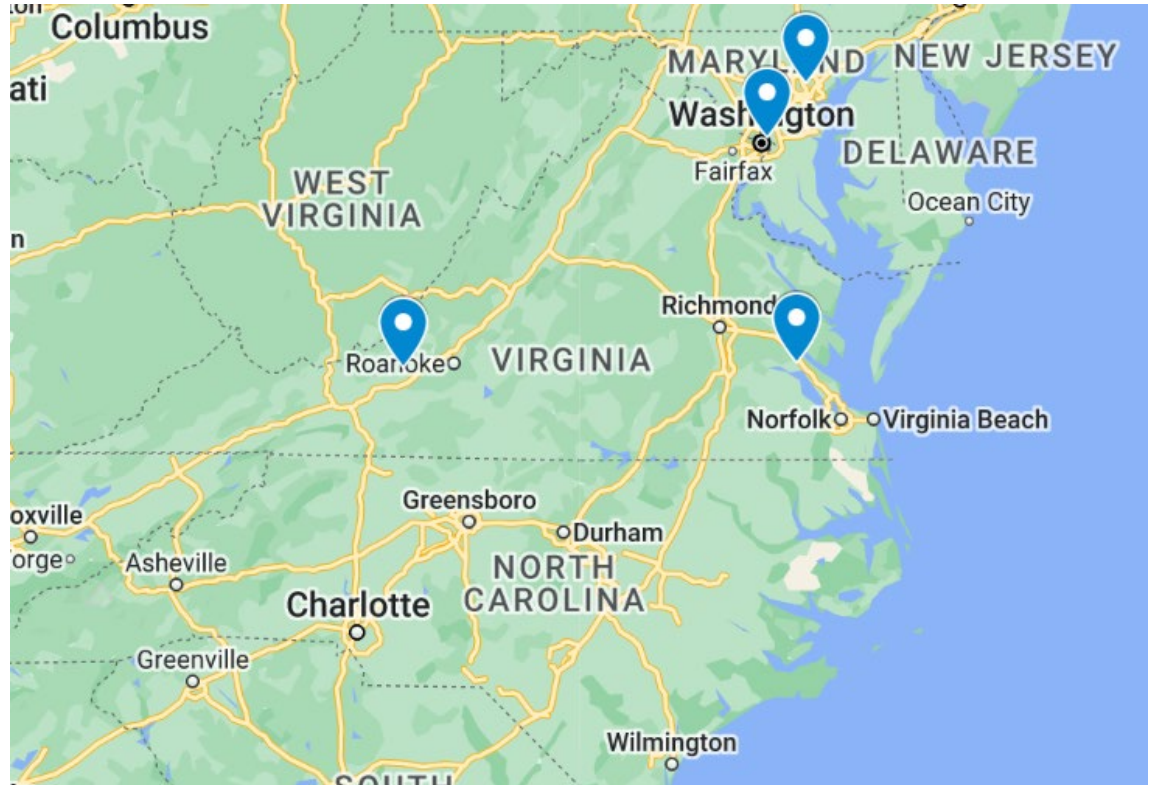
Johns Hopkins

Catholic University

Virginia Tech

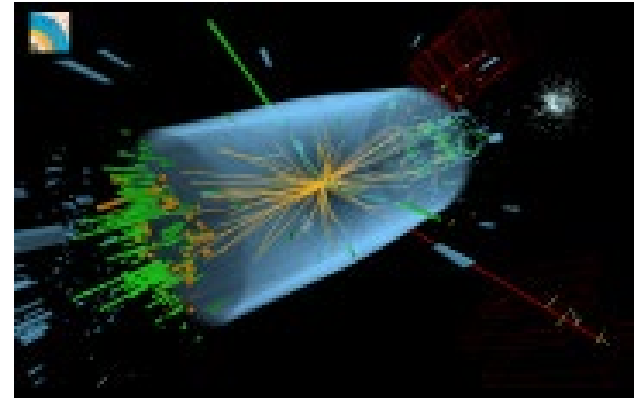
Virginia

Virtual Center





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