The CERN MasterClass

Teachers and Students Experiencing Hands On Science

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“It is change, continuing change, inevitable change, that is the dominant factor in society today. No sensible decision can be made any longer without taking into account not only the world as it is, but the world as it will be”

Isaac Asimov

QuarkNet (started in 2000)

MARIACHI

“Design and Implement a Science Experiment together with Science Teachers and Students (2005)”

EDUCAUSE Learning Initiative
advancing learning through IT innovation

MARIACHI

MARIACHI

By Carie Windham

Edited by Diana Oblinger

ELI Paper 6: 2007
July 2007

Jack Steffens, a senior technician from Stony Brook University, explains detector construction to students from Roosevelt High School as their teacher, Mahyar Nikpour, looks on.

Photo courtesy of Helio Takai.

Abstract

The Mixed Apparatus for Radar Investigation of Atmospheric Cosmic-Rays of High Ionization (MARIACHI) project is setting a new standard for authentic learning—enabling students to learn by doing. Under the direction of scientists, students are building, monitoring, and analyzing data from devices that detect ultra high-energy cosmic rays in the atmosphere. They are also learning how to connect those devices to a larger cyberinfrastructure so they and the scientific community can learn more about these highly charged energy particles.

Where is that roll of Duct tape?

TARA

Welcome to TARA

The Telescope Array RADAR Project

The TARA project works in conjunction with the Telescope Array observatory in Millard County, Utah, towards the goal of detecting cosmic rays using radar technology. TARA researchers use a modified television transmitter, donated by local television stations, as a source of radio waves. These waves are scattered by the atmospheric ionization produced by a cosmic ray and collected many kilometers away by digital radio receivers. One day this technique may be used to cover thousands of square kilometers of the Earth's surface at a fraction of the cost of a “conventional” cosmic ray observatory.

News

TARA Receives $1M Grant from W.M. Keck Foundation

September 25, 2012: TARA investigators, on behalf of the University of Utah, have received a $1,000,000 grant from the W.M. Keck Foundation to create "A Radar Observatory for the Universe's Most Energetic Particles". Construction has already begun on the new W.M. Keck Radar Observatory in Millard County, Utah.

Read the full story here,
and read the project abstract here.

FCC License Awarded

December 15, 2011: The TARA project has received a new experimental broadcast license from the Federal Communications Commission (FCC). This license will enable us to increase our output power at 54.1 MHz to 40 kiloWatts and our Effective Radiated Power (ERP) to 6 MegaWatts, substantially enhancing our search for a radar echo signal.

Construction of the new transmitter will begin early in 2012, and broadcasts as station WF2XZZ should commence by late spring.

TARA - Telescope Array Radar Project

physics central
learn how your world works

Discover

Buzz Blog

Shocking Study from the Largest Cosmic Ray Physics Experiment in the Northern Hemisphere

Thursday, April 03, 2014

Lightning detector in the foreground with a cosmic ray detector in the background. Credit: William Hanlon, University of Utah

There's a chance that the mystifying phenomena we call lightning would not exist without cosmic aid. The same high-energy particles that light the night sky with colorful auroras, scientists think could also explain a longstanding problem in the process of lightning production.

When you shock yourself after reaching for a metal doorknob, you're experiencing a similar process that leads to lightning. As long as the extra charge you accumulate from, for example, rubbing your feet across a carpeted surface reaches a minimum value, called the breakdown voltage, a shock will travel from you to the doorknob.

Storm clouds can also build up extra charge, which must go somewhere. Often times it will either strike the ground or branch outward across the sky in the form of a

TA/LMA Experiment

International Particle Physics Outreach Group

INTERNATIONAL MASTERCLASSES

hands on particle physics

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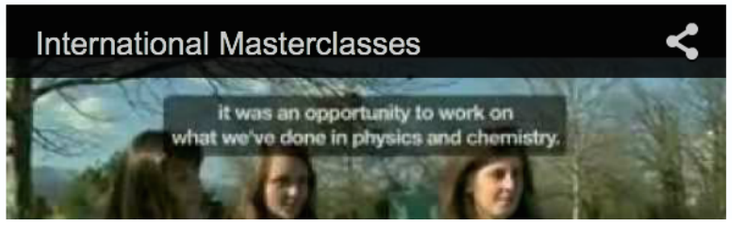
International Masterclasses

10th International Masterclasses 2014

Each year about 10.000 high school students in 40 countries come to one of about 200 nearby universities or research centres for one day in order to unravel the mysteries of particle physics. Lectures from active scientists give insight in topics and methods of basic research at the fundaments of matter and forces, enabling the students to perform measurements on real data from particle physics experiments themselves. At the end of each day, like in an international research collaboration, the participants join in a video conference for discussion and combination of their results. See here for media coverage.

International Masterclasses 2014 will take place from 12.3. - 12.4.2014, including **U.S. Masterclasses**.

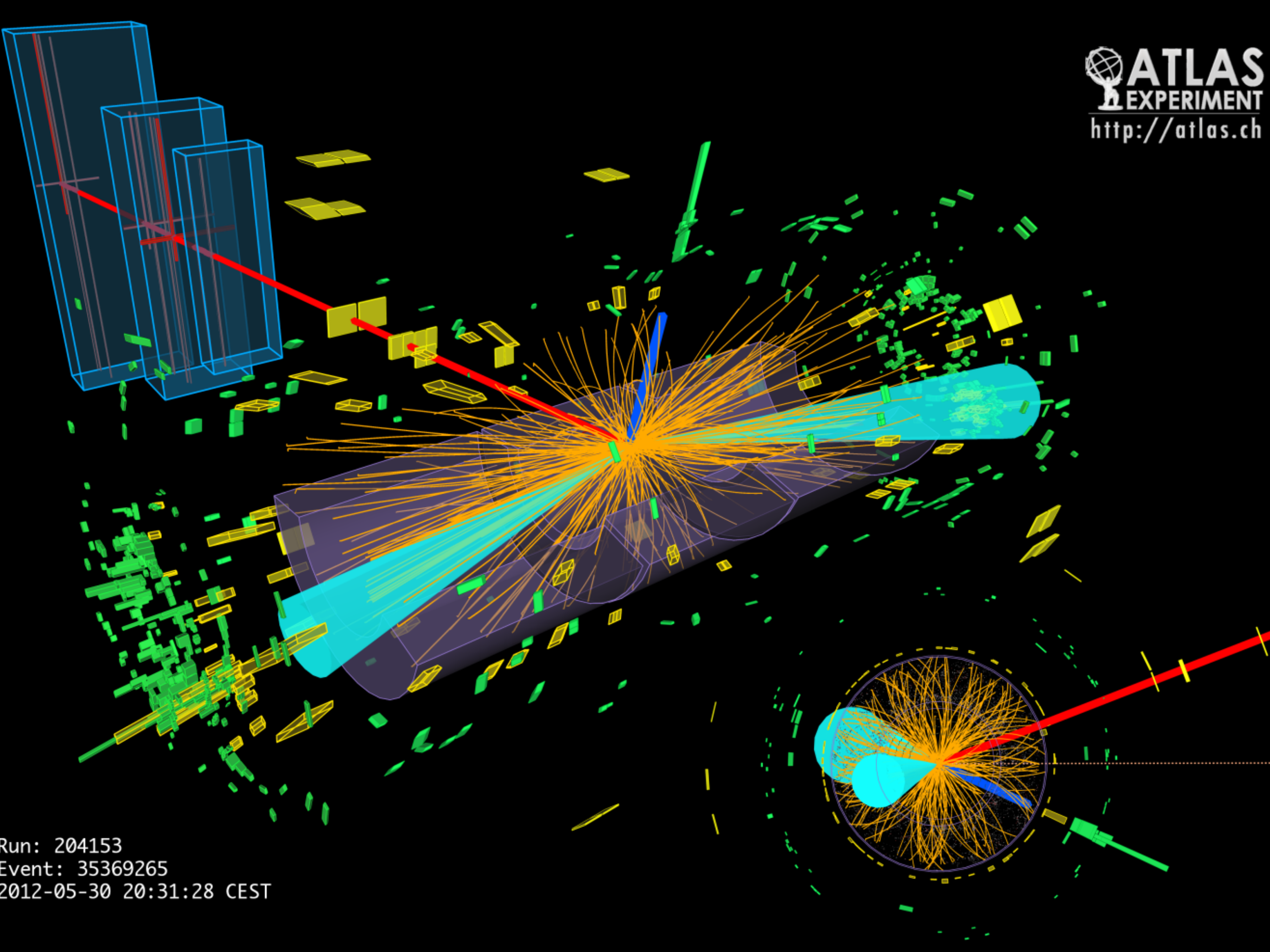
Discover the world of Quarks and Leptons with real data

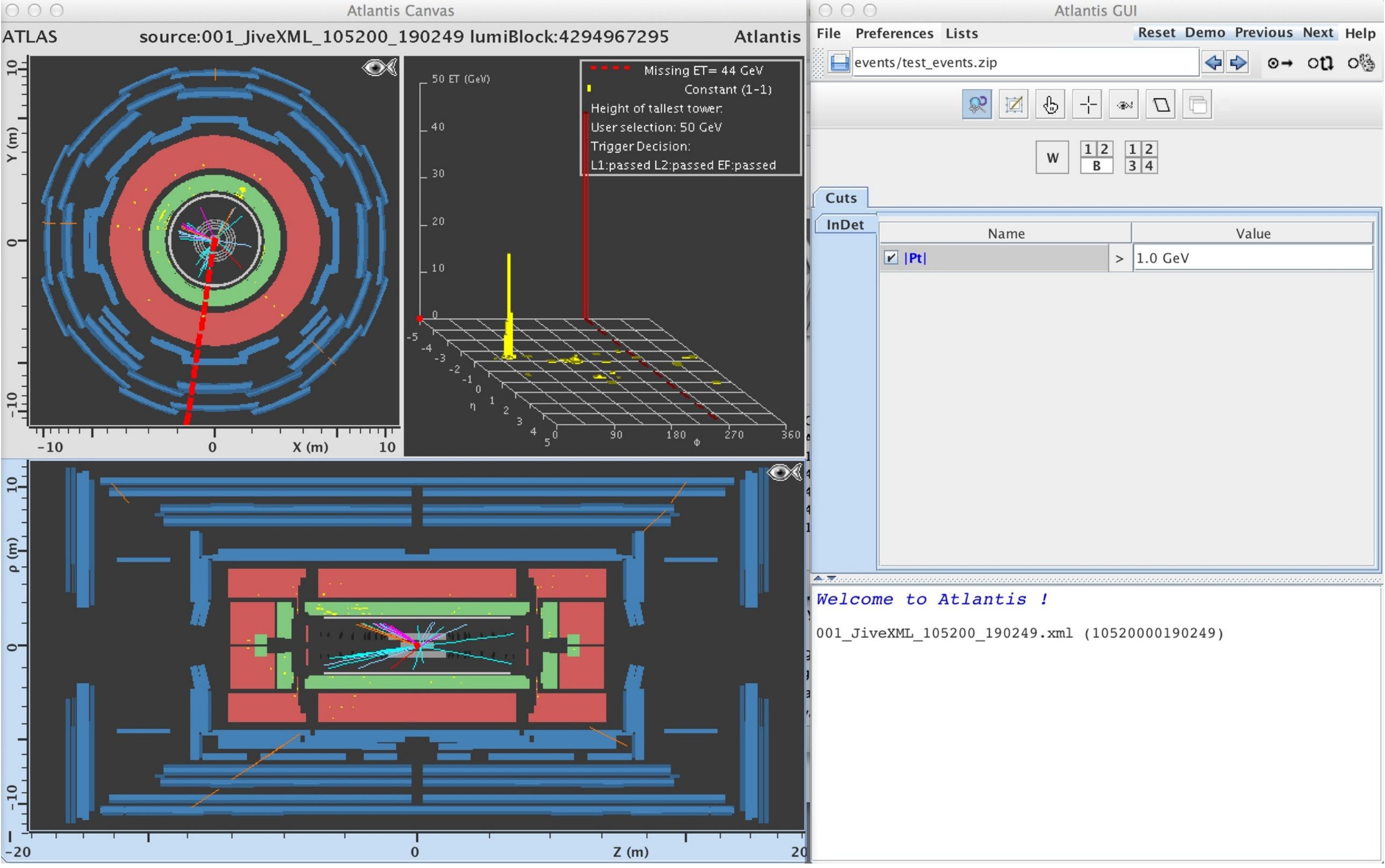


- get out of school for one day and come to a nearby university or research centre
- get insight into topics and methods of basic research at the

http://www.physicsmasterclasses.org

The ATLAS Experiment at CERN


ATLAS
EXPERIMENT
http://atlas.ch
Run: 204153
Event: 35369265
2012-05-30 20:31:28 CEST



The ATLAS Event Display

symmetry

dimensions of particle physics

A joint Fermilab/SLAC publication

Looking for Leptons in All the Right Places

by Jennifer Lauren Lee

Entwistle's students learned what it is like to break new ground in science, relying on collaboration and the answers of your colleagues to check your work. "You come away with a deeper appreciation for what scientists do—how they collaborate with each other," Bohlman says. "Scientists aren't the classic Back to the Future scientist with the white lab coat and the crazy gray hair."

First in the US

(2006)

Above: Tania Entwistle's team of students from Ward Melville High School in New York. Front from left: Stephen Bohlman, Sammi Qin. Back from left: Ram Gupta, Lucas Janson, Ari Richman, Josh Steinberg. Right column: Students around the world participate in videoconferences, lectures, and analysis of particle physics data.

Photos: Ken Cecire, Hampton University; Ivan Melo, Žilinská univerzita, Slovakia; and Christine Kourkoumelis, University of Athens, Greece

“Enrichment, please”

Data Analysis at William Floyd HS

Is that for real?

2013 Video Conference

(before Harlem Shake)

2014 Video conference

William Floyd, Shoreham - Wading River,Smithtown, Farmingville

Tri Hamlet **News**
community magazine

William Floyd Science Students Participate in International Physics Masterclass

APRIL 15, 2014 / NO COMMENTS / 210 VIEWS

"The International Physics Masterclass is a unique opportunity for students to interact in a challenging, active and international learning environment," said Cristina Brazzelli, AP Physics teacher, William Floyd High School. "It also gives them the opportunity to work elbow-to-elbow with scientists and get a taste of how modern research in physics works. This program pulls high-energy physics out of the classroom and into real-life applications."

"She helps lead a particle physics master class that allows students to analyze data collected by CERN, the world-famous laboratory near Geneva, and to talk with its scientists about their findings."

Forty-two LI educators are named NYS Master Teachers

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By JO NAPOLITANO jo.napolitano@newsday.com

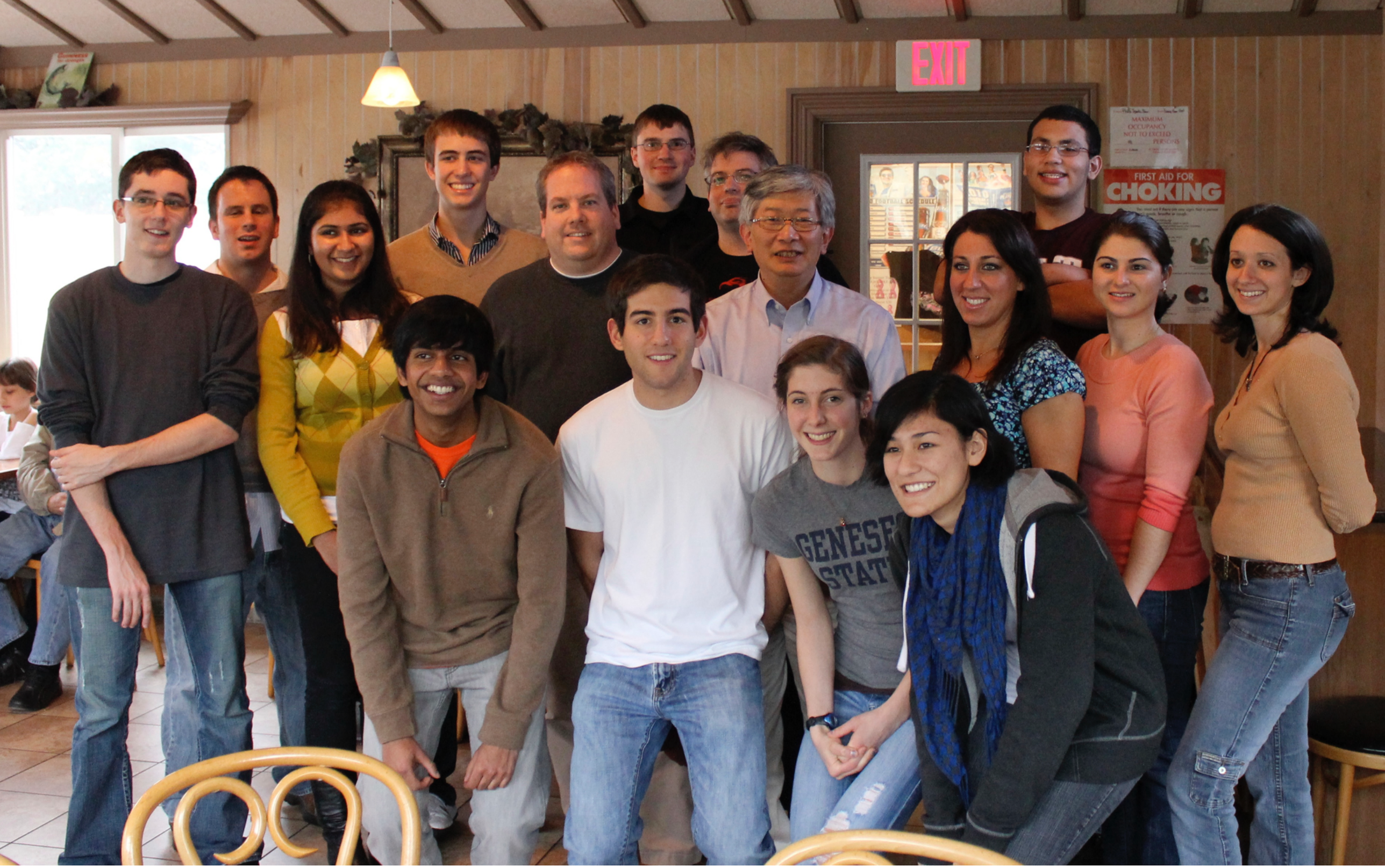
Gillian Winters is one of 42 Long Island teachers selected by the state as Master Teachers on Monday, April 14, 2014. (Credit: Joseph D. Sullivan)

At the American Association of Physics Teachers meeting

“Behind the scenes” tours of Metropolitan Museum, AMNH and of course Brookhaven Labs.

Hailing a cab

"Thanks for the pics and for the invitation. It was fun to talk about the stuff we have worked on, and I had an interesting conversation with Boris from Uzbekistan"



Reunion Lunches

Concluding Remarks

There are ***many good reasons*** why scientists should interact with teachers, students and the public.

“Crowd-sourced” science can lead to ***new science*** and ***new educational initiatives*** - planting new seeds!

The CERN MasterClass is a ***good initiative*** - It gives students a glimpse of “big science”. Students meet peers from other schools and countries to understand (a bit) what we do.

We should also listen to ***critics*****:** “Why don’t we do the same with RHIC data?”

It has been a good run!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COAL CHAMBER
SPECIAL SAUCE
WUSB 90.1 FM
ALIEN CANOPY
CAGE
LOVE, ROBOT
I ♥ L.I.ve MUSIC
I ♥ HIP HOP
RIVIERA REGIME
Q-UNIQUE
NEMS
THE ANCIENTS
I'M READY THE WORKHORSE
Recognition