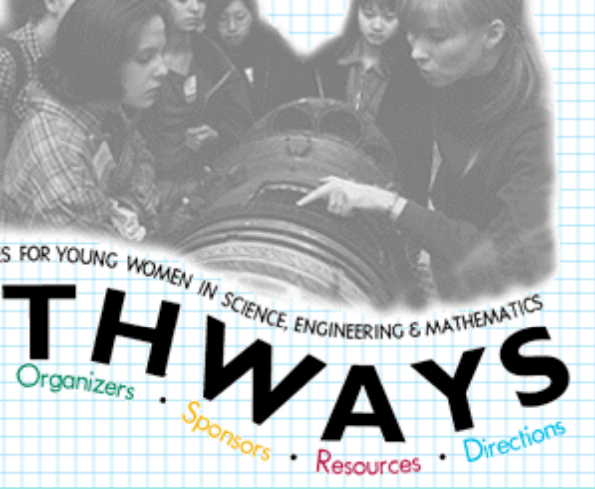




# Report on US Outreach Activities

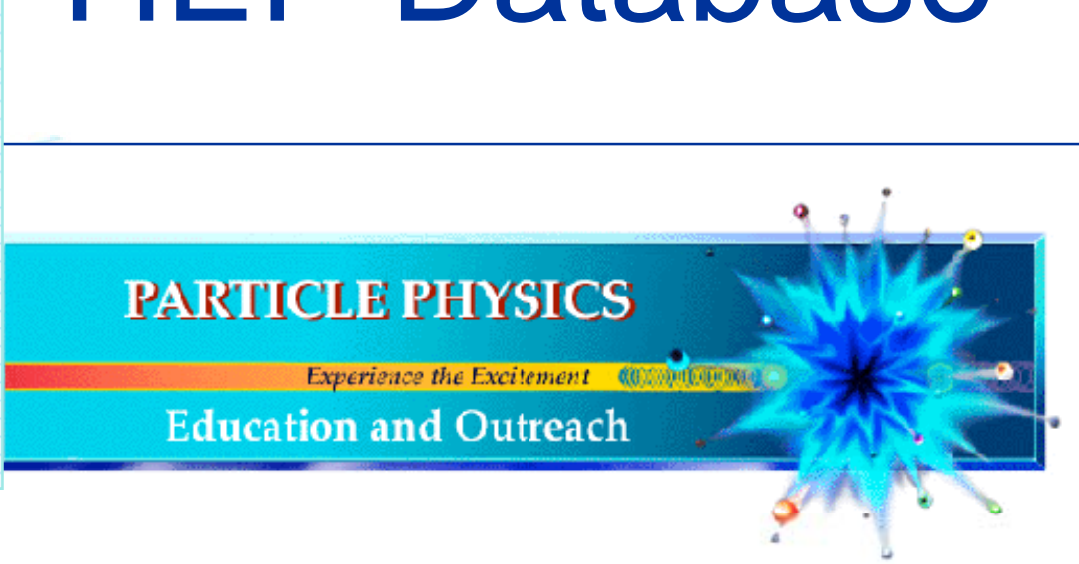
October, 2008



FOR YOUNG WOMEN IN SCIENCE, ENGINEERING & MATHEMATICS

# THWAYS

Organizers • Sponsors • Resources • Directions



generates dazzling electrical arcs about 3 feet (1.0 meter) in length. You can have a Tesla Coil Demonstration at your school to get your students charged up to learn about physics. Please select from the menu on left to find out more about Tesla Coils, our particular Tesla Coil, safety instructions regarding Tesla Coil operation, information about scheduling a Tesla Coil showing at your school, pictures and movies of the Tesla Coil in action, and cool links having to do with Tesla Coils, physics, and science in general.



Many physicists who study the fundamental particles and forces of our universe want to share their excitement about science with others.

**2005 DATABASE:** [Search the database](#) for more than 250 education and outreach programs nationwide that will interest teachers, children—and their parents!—in science, mathematics, and technology. These opportunities include websites, public talks, hands-on activities, workshops, special events, classroom materials, tours, mentoring, research participation, and more.

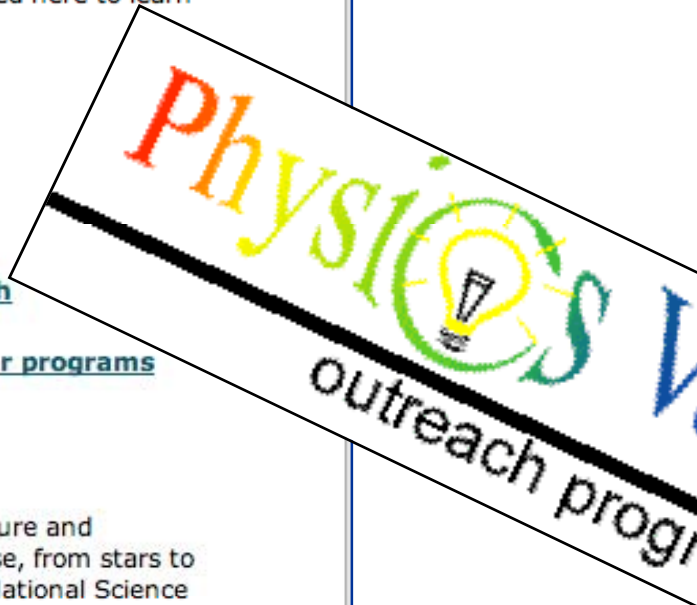
You may call or e-mail any of more than 100 universities and national laboratories listed here to learn more about what they offer.



- [What is all the excitement about?](#)
- [What is particle physics?](#)
- [Connections to science & technology](#)
- [The importance of education & outreach](#)
- [What students & teachers say about our programs](#)
- [A story of how we all can benefit](#)

Particle physicists study matter at the very smallest scale, an exploration of the structure and interactions of the most fundamental particles that make up everything in the universe, from stars to starfish. The United States government, through the Department of Energy and the National Science Foundation, supports several large accelerator laboratories where thousands of university physicists from across the U.S. collaborate on particle physics research.

Other contacts worldwide: [Education Contacts at HEP Labs](#)



airNET is



**Abstract:**

Students can join a scientific collaboration in this series of studies of high-energy collisions from the Large Hadron Collider(LHC) at CERN. We are collaborating with the Compact Muon Solenoid(CMS) Collaboration. From start to finish this is a student-led, teacher-guided project. At the present we have test beam data for analysis. When the LHC starts producing data, students will be able to request data with specific parameters. By using the web and GRID computing technology students will be able to analyze the data. A virtual data portal enables students to share this data and associated analysis code with students and other researchers.

Students use a data base and analysis tool on the website. The Online Graphical ROOT Environment(OGRE) is the analysis tool used to analyze the data they have chosen for their study. Many tutorials are available to build basic scientific skills, to explain the how the detector works, to increase students understanding of subatomic particles, to direct in using the analysis tools and to explain how to use plots to analyze data. Students can then perform any of or detector resolution. Students post the results of their studies as online posts. Students can review the results of other studies online comparing data and with other research groups, post comments and questions, prepare summaries of scientific research that is often left out of classroom experiments.

View Student Home as a: [new student](#) - [returning student](#).

**Introduction to Research:**

The CMS Project explores the potential of using virtual data grid tools and the cosmic ray e-Lab, this e-Lab provides an opportunity for:

**Logout**

If you are not guest, [Logout](#)

**Cosmic Ray e-Lab**

Logged in as group: [guest](#)

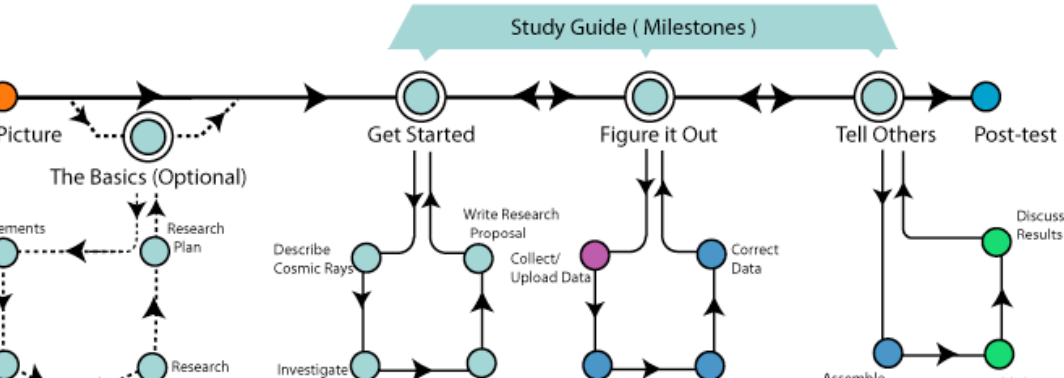
[Logout](#)  
[My Logbook](#)


- [Home](#)
  - [Library](#)
  - [Data](#)
  - [Posters](#)
  - [Site Index](#)
  - [Assessment](#)
- [The Basics](#)
  - [Study Guide](#)
  - [Resources](#)
  - [Big Picture](#)
  - [FAQs](#)
  - [Site Help](#)

**Work as a team. Make sure each team member meets these milestones.**

Map below to guide your work. Click on the hotspots to get references for accomplishing your milestones.

In your workflow indicate where your teacher monitors your progress by commenting on the entries you make in your logbook for each milestone. Be sure to read the comments!

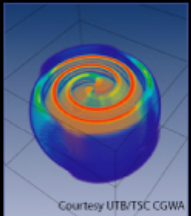




## Welcome to the LIGO I2U2 E-Lab

Laser Interferometer Gravitation

Teacher Home
Student Home




Courtesy UTB/TSC CGWA

The LIGO E-Lab provides an online environment in which students experience the excitement of so investigating seismic behavior. Seismic energy from earthquakes, wind, ocean waves and human a visible and meaningful as students plot data from seismometers at LIGO Hanford Observatory

Seismic processes influence the behavior of LIGO's gravitational wave detectors. Inquiry-based E- designed and conducted by students, will connect to LIGO in exciting and authentic ways. Student quest to detect gravitational waves as they analyze the vibrations of the ground underneath LIGO's interferometers.

Information common for all e-Labs



This project is supported in part by the National Science Foundation and the Office of High Energy Physics in the Office of Science, U.S. Department of Energy. Opinions expressed are those of the authors and not necessarily those of the Foundation or Department.

# Cosmic Ray Studies



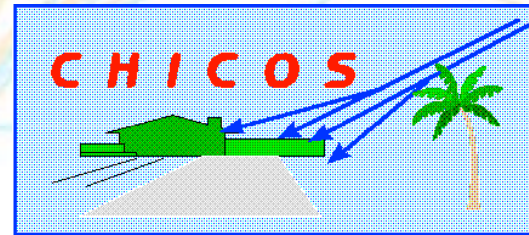
Summer Workshop  
Labview interface  
Revised data upload & bless  
Ran a 12-detector, 3-DAQ  
array



## QuarkNet

### FY07 Growth

counts: 320 → 553  
posters: 144 → 255  
data files: 12,297 → 17,155



# US/LHC Student Journalist Program



[lhscience.org/journalists](http://lhscience.org/journalists)



CERN Open Day



LHC Discovery Physics Animation

ent Go To Site  
ular Updates  
ured Links  
s Items  
ent Work  
sroom  
ivities

The screenshot shows the US/LHC website with a dark blue header featuring a starburst logo and the text "US/LHC Particle Physics at Discovery's Horizon". A navigation bar contains links: "What is the LHC?", "The US and the LHC", "LHC Science", "News", "Images", "Teachers and Students", and "Search". The main content area is titled "Teachers and Students" and includes a breadcrumb "Home > Teachers and Students". Below the title is a paragraph: "In September as school begins, particle physicists have started up the LHC. While you are learning physics, particle physicists will begin exploring new forces of nature, new forms of matter, new dimensions of space. Beneath the Swiss and French countryside protons will collide to reveal some of nature's deepest secrets... and you can be there. This is a great year for particle physics. Learn more! Stay tuned!". A section titled "Large Hadron Rap" contains a video player with a play button and the text "all these stars together" overlaid on the video. The video player shows a scene with people in a tunnel. To the right of the video is a sidebar with "In this section:" containing a link to "Web Resources", and "More information:" containing links to "LHC Start-up" and "LHC Student Blogs". Below this is a thumbnail for "LHC Pajama Party" with a link to "Pictures and quotes from LHC Pajama Party" and another link to "Videos from LHC Pajama Party".

US/LHC  
Particle Physics at Discovery's Horizon

What is the LHC? | The US and the LHC | LHC Science | News | Images | Teachers and Students | Search

Home > Teachers and Students

### Teachers and Students

In September as school begins, particle physicists have started up the LHC. While you are learning physics, particle physicists will begin exploring new forces of nature, new forms of matter, new dimensions of space. Beneath the Swiss and French countryside protons will collide to reveal some of nature's deepest secrets... and you can be there. This is a great year for particle physics. Learn more! Stay tuned!

#### Large Hadron Rap

all these stars together

YouTube

0:00 / 0:00

In this section:

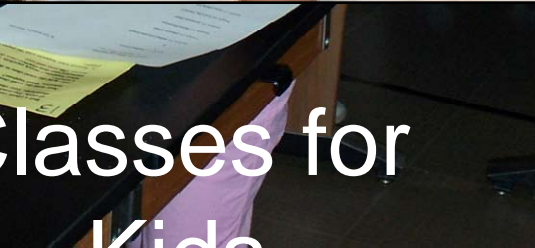
- [Web Resources](#)

More information:

- [LHC Start-up](#)
- [LHC Student Blogs](#)

**LHC Pajama Party**

- [Pictures and quotes from LHC Pajama Party](#)
- [Videos from LHC Pajama Party](#)



Find out and earn Einstein Bucks as you explore Fermilab month.

**LHC PJP Party**

TOOLS: Detectors

**One Crick'n'**  
METHODS

**Law 'n Order**  
IDEAS

5000  5000

**Eamc<sup>2</sup>**



Classes for Kids