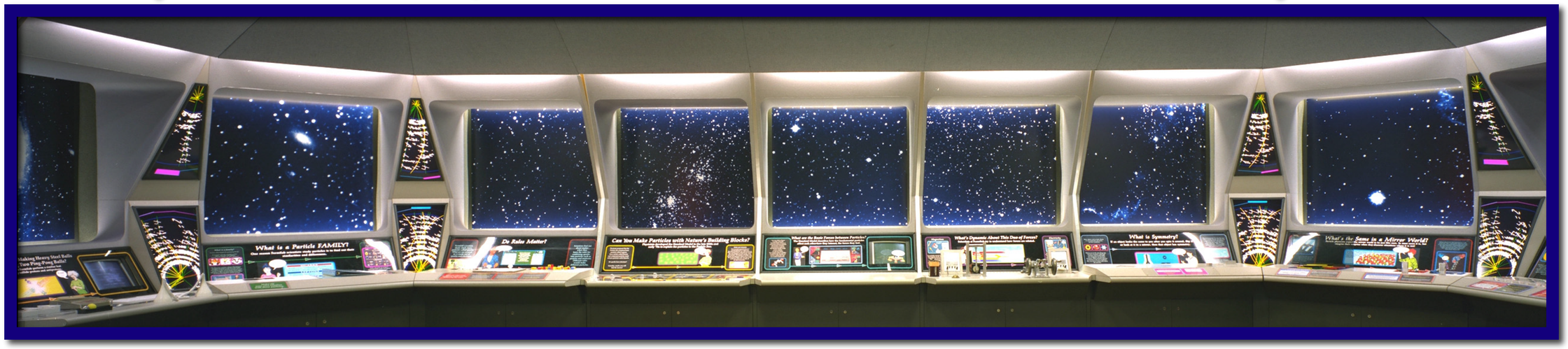
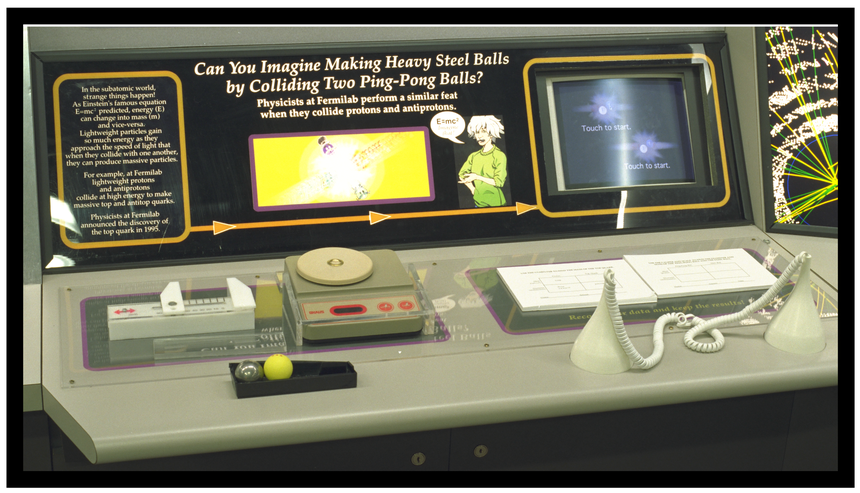
Top Teaches

Top Discovery Motivates Exhibit Development.



Sectors of top quark events from CDF provide a view into inner space for visitors to the Lederman Science Center.

CAN YOU IMAGINE MAKING HEAVY STEEL BALLS BY COLLIDING TWO PING-PONG BALLS?

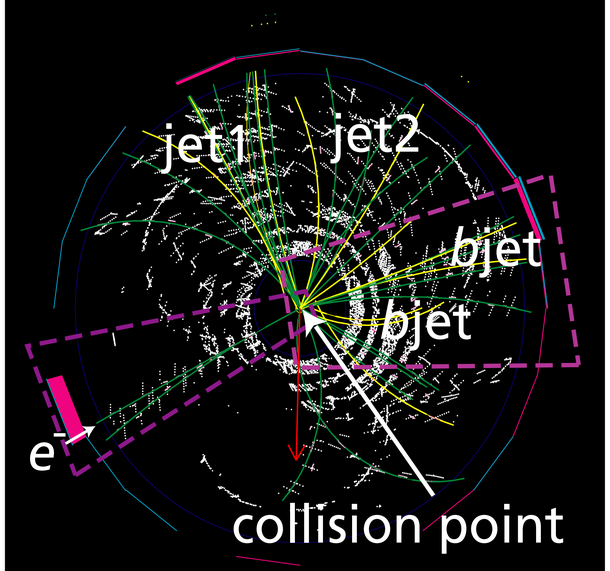


Using a top quark event, an Einstein puppet introduces middle schoolers to the concept of $E=mc^2$. He compares making heavy steel balls by colliding two Ping Pong balls to the production of top quarks from the collision of a proton and antiproton.

Students calculate the mass of the top quark with data from a top quark event. They weigh and measure the diameter of a Ping Pong ball and steel ball on the tabletop. The weights of the two balls are in approximate proportion to the mass of the proton and top quark.

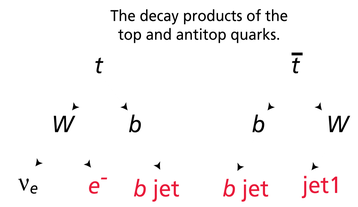
It is a spinoff of the high school top quark activity developed by Bob Grimm. Movies explain what a GeV is and show various views of the data (lego, CTC, endview, RZ-View) and 3-D renderings of the calorimeter.

A legend describes one of the events on display.



This top quark event, observed at the Collider Detector, contains an electron (e^-) and b quark jets, created when the top and antitop quarks decay. The top quarks only live a short time and quickly decay into W bosons and b quarks. The Ws and bs, in turn, decay into an electron (e^-), a neutrino (ν_e), two b quark jets and two other jets. Jets are a spray of particles. Physicists see the tracks of the offspring of the top quarks in their data. Two slices from the plot of data from the Central Tracking Detector are displayed in the large light panels. These slices are delineated with dashed purple lines. Try to find the tracks of the electron (e^-) in the top panel and the two b jets, multiple tracks, in the bottom panel. The collision point is at the top in the top panel and at the bottom in the bottom panel. Two slices from the plot of data from the Central Tracking Detector are displayed in the large light panels. These slices are delineated with dashed purple lines. Try to find the tracks of the electron (e^-) in the top panel and the two b jets, multiple tracks, in the bottom panel. The collision point is at the top in the top panel and at the bottom in the bottom panel.

The decay products of the top and antitop quarks.



Particles in red are labeled in the plot of data.

FIND TOP'S GRANDCHILDREN

Can you trace tracks left by the top quark's grandchildren?