

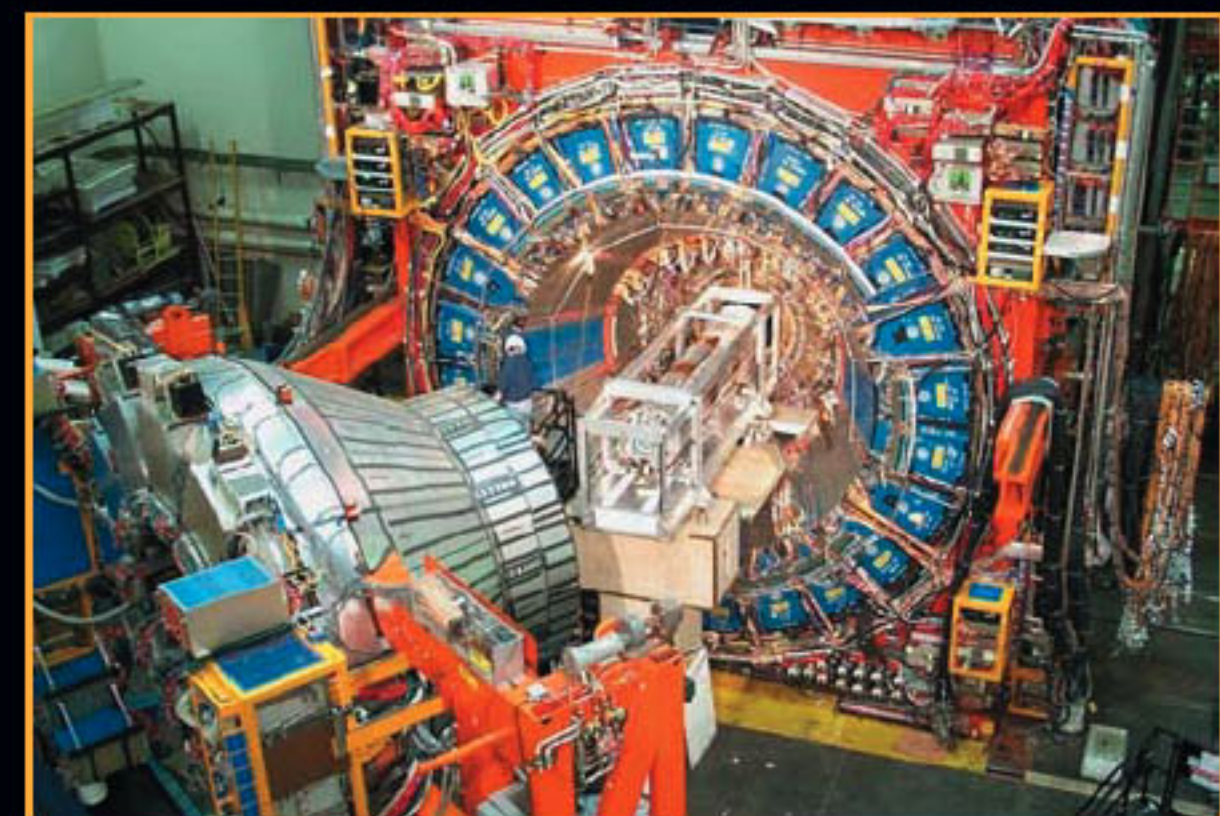
PEERING INTO HIDDEN DIMENSIONS

HIDDEN DIMENSIONS



Other Universes?

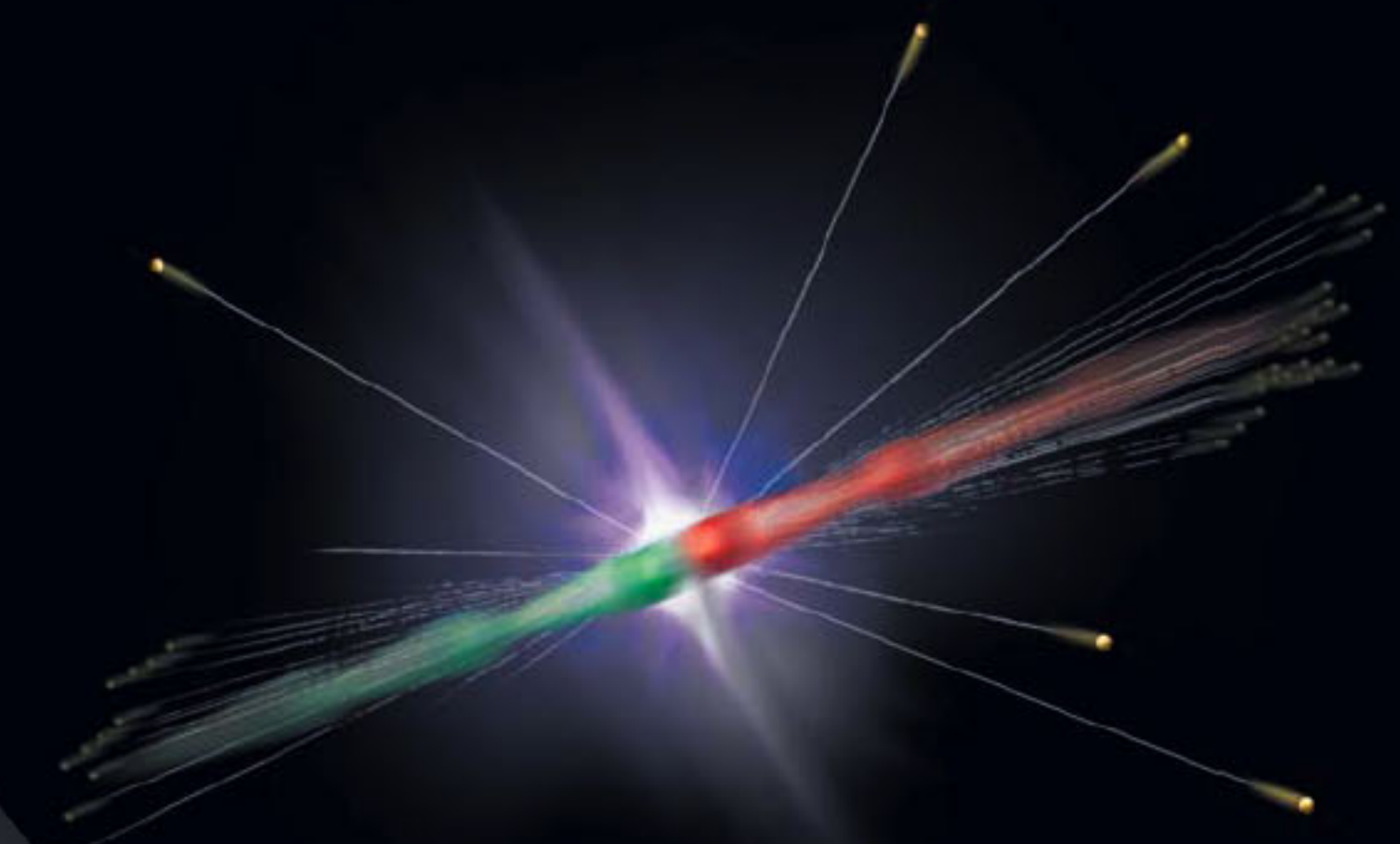
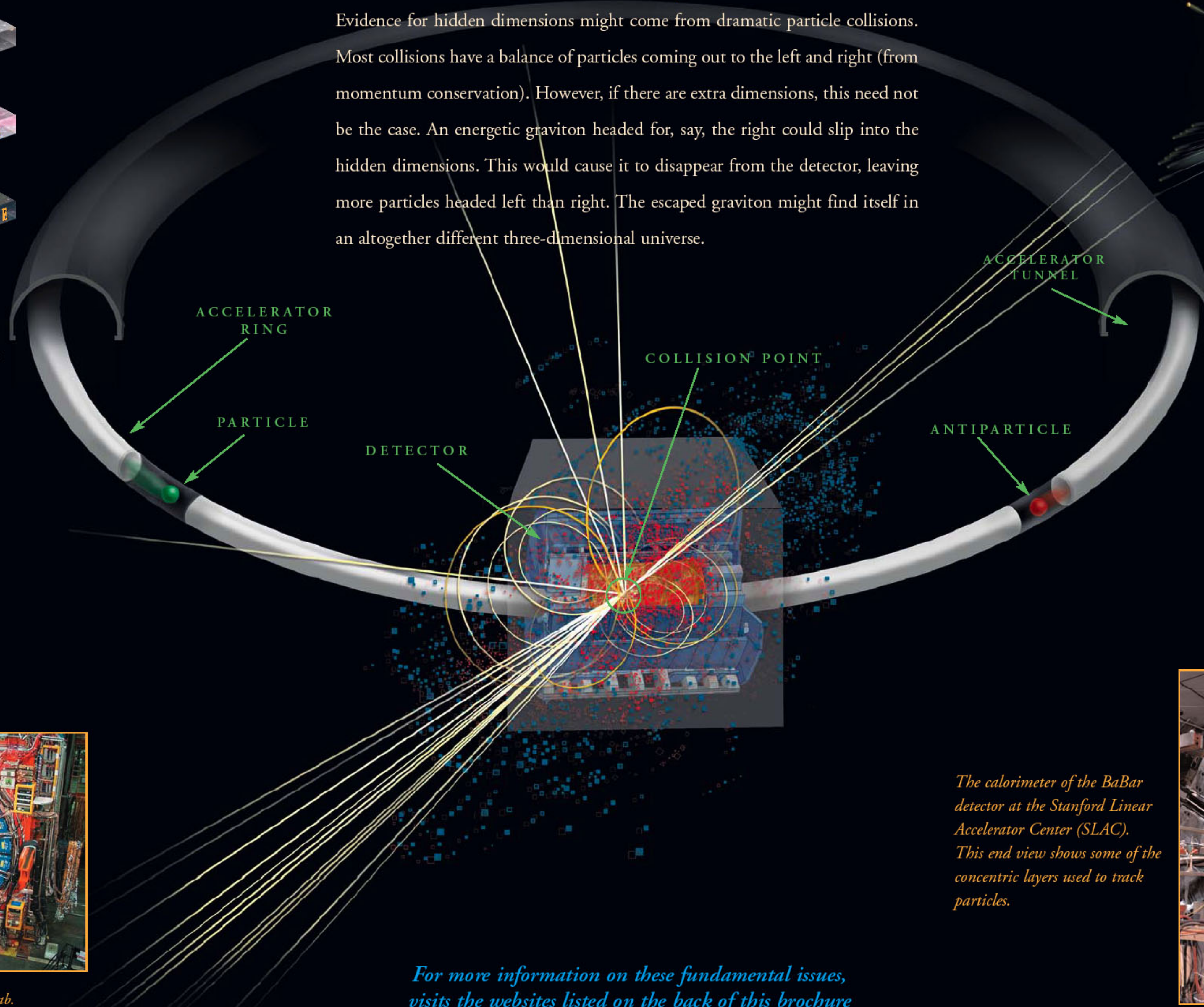
Our three-dimensional universe may be only one of many 3D universes. These universes may lie within extra (hidden) dimensions. To illustrate this, we show 2D universes in a space with a hidden 3rd dimension. Because of this 2D analogy, these parallel universes are sometimes called "branes," short for membranes. If gravitons (carrier particles of the gravitational force) can travel through other dimensions, they may be putting us in touch with other universes!



Inner working of the CDF detector at Fermilab.

Accelerator Experiments

Evidence for hidden dimensions might come from dramatic particle collisions. Most collisions have a balance of particles coming out to the left and right (from momentum conservation). However, if there are extra dimensions, this need not be the case. An energetic graviton headed for, say, the right could slip into the hidden dimensions. This would cause it to disappear from the detector, leaving more particles headed left than right. The escaped graviton might find itself in an altogether different three-dimensional universe.



Mini Black Holes

Microscopic black holes might be produced in particle collisions that occur when very-high-energy cosmic rays hit particles in our atmosphere. These mini-black-holes would decay into ordinary particles in a tiny fraction of a second and would be very difficult to observe in our atmosphere. However, in powerful accelerators now under construction, we may be able to study these decays in laboratory collisions and show that they came from mini-black-holes.



The calorimeter of the BaBar detector at the Stanford Linear Accelerator Center (SLAC). This end view shows some of the concentric layers used to track particles.

For more information on these fundamental issues, visits the websites listed on the back of this brochure