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Accelerators: How Do We Get to 100 TeV?

Wednesday 9 April 2014 12:00 (25 minutes)

Particle colliders for high-energy physics have been in the forefront of scientific discoveries for more than half a century. The accelerator technology of the colliders has progressed immensely, while the beam energy, luminosity, facility size, and cost have grown by several orders of magnitude. The method of colliding beams has not fully exhausted its potential but has slowed down considerably in its progress. I will briefly review the development of the collider technology, examine near-term collider projects that are currently under development, derive a simple scaling model for the cost of large accelerators and colliding beam facilities based on costs of 17 big facilities which have been either built or carefully estimated. The cost parametrization will guide our consideration of possible future frontier accelerator facilities. I will conclude with an attempt to look beyond the current horizon and to find what paradigm changes are necessary for breakthroughs in the field.

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