

Tevatron's Complex Collider Cousins

According to Bertram Schwarzschild's story "Disappointing Collider Performance and Tight Budgets Confront Fermilab With Tough Decisions" ([Physics Today, November 2003, page 22](#)), "The Tevatron collider is, by far, the most complex accelerator ever to reach the operation stage." This is not so—other accelerators of comparable complexity exist, if complexity is measured by the technologies used, the numerical size of the accelerator subsystems, or the number of operational modes. A few examples from other hadron accelerators illustrate our point.

Antiprotons were also generated for CERN's SPS collider, which operated from 1981 to 1990. In addition, HERA, in operation at the German synchrotron facility DESY, is an electron–proton collider of comparable size and proton energy. Like the Tevatron, the HERA proton ring uses superconducting magnet technology.

In its brief career so far, Brookhaven National Laboratory's Relativistic Heavy Ion Collider (RHIC) has collided not only polarized protons with fully stripped gold ions, but also deuterons with gold ions. Although RHIC's proton energy is only a fourth of the Tevatron's, the total length of its two rings of superconducting magnets exceeds the length of the Tevatron's single ring. RHIC has more magnets, more power supplies, and more RF cavities than the Tevatron.

Yes, the Tevatron is the premier collider at the energy frontier, but it is not alone in its complexity.

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