

Abstract for an Invited Paper
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Abraham Pais Prize for History of Physics Lecture: Big, Bigger, Too Big? From Los Alamos to Fermilab and the SSC¹
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The modern era of big science emerged during World War II. Oppenheimer's Los Alamos laboratory offered the quintessential model of a government-funded, mission-oriented facility directed by a strong charismatic leader. The postwar beneficiaries of this model included the increasingly ambitious large laboratories that participated in particle physics—in particular, Brookhaven, SLAC, and Fermilab. They carried the big science they practiced into a new realm where experiments eventually became as large and costly as entire laboratories had been. Meanwhile the available funding grew more limited causing the physics research to be concentrated into fewer and bigger experiments that appeared never to end. The next phase in American high-energy physics was the Superconducting Super Collider, the most costly pure physics project ever attempted. The SSC's termination was a tragedy for American science, but for historians it offers an opportunity to understand what made the success of earlier large high-energy physics laboratories possible, and what made the continuation of the SSC impossible. The most obvious reason for the SSC's failure was its enormous and escalating budget, which Congress would no longer support. Other factors need to be recognized however: no leader could be found with directing skills as strong as those of Wilson, Panofsky, Lederman, or Richter; the scale of the project subjected it to uncomfortable public and Congressional scrutiny; and the DOE's enforcement of management procedures of the military-industrial complex that clashed with those typical of the scientific community led to the alienation and withdrawal of many of the most creative scientists, and to the perception and the reality of poor management. These factors, exacerbated by negative pressure from scientists in other fields and a post-Cold War climate in which physicists had little of their earlier cultural prestige, discouraged efforts to gain international support. They made the SSC crucially different from its predecessors and sealed its doom.

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