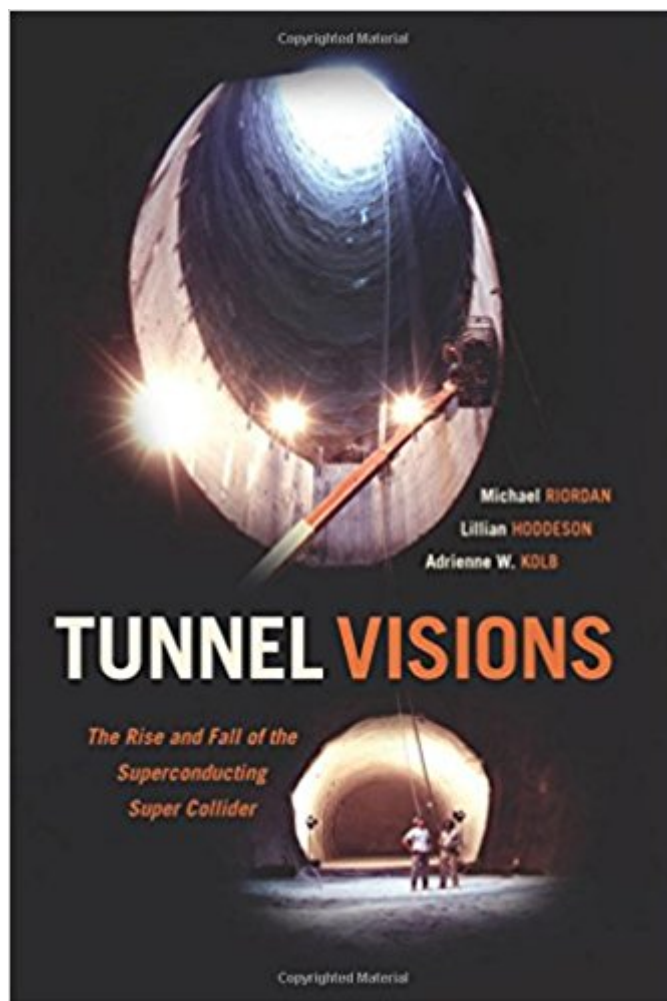


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Tunnel Visions: The Rise And Fall Of The Superconducting Super Collider



Synopsis

Starting in the 1950s, US physicists dominated the search for elementary particles; aided by the association of this research with national security, they held this position for decades. In an effort to maintain their hegemony and track down the elusive Higgs boson, they convinced President Reagan and Congress to support construction of the multibillion-dollar Superconducting Super Collider project in Texas—the largest basic-science project ever attempted. But after the Cold War ended and the estimated SSC cost surpassed ten billion dollars, Congress terminated the project in October 1993. Drawing on extensive archival research, contemporaneous press accounts, and over one hundred interviews with scientists, engineers, government officials, and others involved, *Tunnel Visions* tells the riveting story of the aborted SSC project. The authors examine the complex, interrelated causes for its demise, including problems of large-project management, continuing cost overruns, and lack of foreign contributions. In doing so, they ask whether Big Science has become too large and expensive, including whether academic scientists and their government overseers can effectively manage such an enormous undertaking.

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Customer Reviews

"The termination of the Superconducting Super Collider project in 1993 sent more than US\$10 billion down the drain and left the US high-energy-physics community reeling. In this in-depth tome on that "epochal transition", science historians Riordan and Hoddeson, with

Fermilab archivist Kolb, cover all the bases leading to that bitter end—which, they conclude, was down to a “cold-war mindset” and the untenable cost of going it alone.” (Nature) “Tunnel Visions, a nearly three-decade writing project, describes the birth and death of the SSC. The authors...illuminate the serious problems that led to the 1993 congressional vote to terminate the SSC. Because of my personal ties to the field and to the national lab community, I enjoyed the play-by-play account in Tunnel Visions. The SSC has lessons for all who advocate the public funding of science.” (Physics Today) “Most good science stories are tales of discovery and success, but failure can be just as riveting. Here two historians and an archivist describe the greatest particle physics experiment that never was. The Superconducting Super Collider (SSC), a planned 87-kilometer ring in Texas, would have crashed protons together at higher energies than any accelerator before or since, dwarfing even the current Large Hadron Collider at CERN, where the Higgs boson was discovered. But in 1993 Congress pulled the plug on the more than \$10-billion project because of cost overruns, mismanagement and changing political tides. Tunnel Visions examines what went wrong and what lessons the failure of the SSC can impart in an era when such Big Science projects are increasingly central to scientific research.” (Scientific American) “Tunnel Visions is an engaging history of the rise and fall of the Superconducting Super Collider (SSC), a proton accelerator being built south of Dallas, Texas. The project was canceled in 1993. Riordan, Hoddeson, and Kolb drew upon oral histories of key participants, archival material, and press accounts to explore the reasons for the failure of this basic science enterprise, which was by far the largest and most expensive ever undertaken. Highly recommended.” (Choice) “Riordan, Hoddeson and Kolb are experienced US historians of science....their book is based partly on oral interviews with more than 100 participants in the SSC project, including politicians, political advisers, physicists, and science journalists. Other facts are drawn from published statements dating from the 1970s to the present, or from the many archive of unpublished evidence. It is not the first history of the SSC, but it is likely to be the last word on the subject. Tunnel Visions will unquestionably be vital reading for anyone interested in the complications of funding “big science,” especially projects requiring international contributions.” (Physics World) “Although there are other published reflections about the SSC, the book Tunnel Visions deserves readers’ attention because of the prolonged efforts of Riordan, Hoddeson, and Kolb. The historians not only witnessed the rise and fall of the gigaproject but also conducted and critically analyzed about one hundred interviews into the fate of the SSC. It seems gargantuan projects in physics are not impossible nowadays. The authors, by giving CERN as an example, argue that, nevertheless, in order to succeed, these giga-projects have to be organized in a way completely different from those

in the past. A Big Science project of the XXI century can no longer be the exclusive fantasy of a visionary; it must be a multifaceted global enterprise of social and political proportions. That requires society as a whole to determine the worth of knowledge. And to figure out who will pay for its pursuit.

—• (Endeavor)"Precise and exhaustive...A down to earth story of the national pride, good physics and bad economics of one of the biggest collider projects in history." (The CERN Courier)"This work represents the culmination of a multi-decade effort to document and analyze the last chapter in the saga of US high energy physics that began with the efforts of Ernest Lawrence in the 1930s and ended with the cancellation of the SSC in 1993. The authors of Tunnel Visions, all veterans of earlier successful attempts to chronicle the development of high energy physics, were well situated and adequately supported to perform the postmortem of this colossal project. There are many lessons to be learned from the SSC, and Tunnel Visions provides a broader perspective from which to view this saga of superconducting super colliders." (Physics in Perspective)"Tunnel Visions is a detailed and engaging account of the development of the superconducting supercollider, one of the largest scientific undertakings in the United States....Tunnel Visions must also be commended for its combination of social, cultural, and political factors within the context of the history of science. The book is a must-read for anyone interested in the national funding of science in the United States." (Journal of American History)"Tunnel Visions is the story of the national and international maneuvers to take the next big step in particle accelerators that had brought a string of Nobel Prizes to scientists in the U.S. and Europe: the Superconducting Super Collider. Though specialists will find much here of value, no specialized knowledge is necessary to find the story of the rise and fall of the SSC project fascinating. Focusing on the scientific, technical, and political conflicts that led to delays, ever rising costs, and eventually the SSC's cancellation by Congress, Tunnel Visions is a true techno-thriller." (Burton Richter, winner of the Nobel Prize in Physics)"The sad history of the SSC has now been told in full in a long-awaited book, thoroughly researched and enlightening. The authors have synthesized their findings in a compact, engaging, and impressively frank narrative. While much has been written about the SSC, this is the definitive account. Tunnel Visions is worth the attention of all scientists, science administrators, and indeed everyone who wants to know how pioneering science may or may not be conducted in our times." (Spencer Weart, Director Emeritus of the AIP Center for History of Physics)"Riordan, Hoddson, and Kolb meticulously piece together how regional and budgetary politics, mismatches between technical cultures, sniping from condensed-matter physicists, and administrative blindness by high energy physicists gradually turned the SSC, in Congress's

eyes, into a monstrous, unsupportable boondoggle. Tunnel Visions is a layered, insightful story of a grand failure—and one of the first great histories of American physicists—, a painful transition into our post-Cold War world." (Cyrus C.M. Mody, Rice University)"Most of books and articles written about the SSC's history are lacking detail and more frequently were simply dead wrong. My perspective of the SSC is first hand as an employee from the very beginning to the bitter end. I have been waiting a long time for an accurate accounting of the project and a source for answering some of the nagging questions of why the project failed. Tunnel Visions is the only complete rendering of information related to the Supercollider project and most important (and surprising), is the depth of information the authors managed to find and successfully interpret. I did not believe it would be possible to find the information let alone understand the nuances of the critical factors that led to the creation and demise of the SSC. This is a must read for anyone interested in the SSC or how such a large and important science project can fail. This is the book that finally put the period on the end of the SSC sentence." (Greg Chartrand, Pacific Northwest National Laboratory)"Physicists create particle collisions so they can sift through the debris for clues to how nature is put together. The authors of Tunnel Visions see the SSC's demise as a saga of colliding communities, which they sift through for clues to understand the interactions involved in large scientific projects. This book raises important questions about how to build, coordinate, and manage the network of leaders, administrators, overseers, and congressmen needed for large scientific projects in the 21st century—and about how this network, if ruptured, can be repaired." This is a fascinating, well-researched account of a turning point in American science." (Robert Crease, Stony Brook University)

Michael Riordan, a physicist and science historian, is author of *The Hunting of the Quark* and coauthor of *Crystal Fire*. Lillian Hoddeson, the Thomas Siebel Professor Emerita of the History of Science at the University of Illinois, is coauthor of *Crystal Fire*, *Critical Assembly*, *True Genius*, and *Fermilab: Physics, the Frontier, and Megascience*. Adrienne W. Kolb was, until her retirement in mid-2015, the Fermilab archivist. She is coauthor of *Fermilab: Physics, the Frontier, and Megascience*.

Most of books and articles written about the SSC's history were lacking detail and more frequently were simply dead wrong. My perspective of the SSC is first hand as an employee from the very beginning to the bitter end. I have been waiting a long time for an accurate accounting of the project and a source for answering some of the nagging questions of why the project failed. This book

provided closure for me by filling in the information gaps I had related to the events and decisions that were critical in determining the fate of the SSC. This book is the only complete rendering of information related to the Supercollider project and most important (and surprising), is the depth of information the authors managed to find and successfully interpret. I did not believe it would be possible to find the information let alone understand the nuances of the critical factors that led to the creation and demise of the SSC. This is a "must read" for anyone interested in the SSC or how such a large and important science project can fail. This is the book that finally put the period on the end of the SSC sentence.

If you were there you will recognize this as accurate if uncomfortable. Lots of capable people failed to respect and combine their skills in a common purpose. The project may still have been judged too expensive to gain political, scientific and popular support but we would have made it more difficult to dismiss it as poorly managed.

Excellent read, hard to put down. Relatively accurate from my point of view, fully illustrates what happens when you take your eye off the ball. Recommend it to anyone who had any connection to the SSC or any large Science project.

Very detailed account of what went on during the SSC days.

The book contains a mountain of details based on interviews. What it lacks is a convincing synthesis of the information accumulated.

The SSC was to be more than ten times bigger in size and cost than any previous physics project. It turned out to be bigger than the historical character of the times or the structures of the physics community could support: Congress canceled the project even as construction was underway. Decades would pass before a less ambitious high-energy accelerator, at CERN in Europe rather than in America, reached one of the SSC's goals with the discovery of the Higgs boson. The sad history of the SSC has now been told in full in a long-awaited book, thoroughly researched and enlightening. The full story includes many issues seldom met in histories of science: priorities in engineering design, public relations work, open warfare between scientific disciplines over funding, and more. Among the themes the authors treat at length are pork-barrel competition between states for the laboratory site, debates reaching into Congress

over the value of big science, and increasingly desperate efforts to get foreign nations to join in funding the project. Another way this story is different from traditional histories of science is that a reader can follow the main lines without understanding any science; indeed the physics was opaque to the politicians who funded the SSC, to say nothing of the taxpayers. Yet this is genuine history of science as the enterprise stands nowadays. (And the authors do explain the motivating physics for readers who want it.) Historians of science rarely tell tales of failure. Yet failures can be even more instructive than successes: just as we can learn much about the body's normal functioning from brain injuries and other diseases, so we can learn much of how the scientific community may function at its best by looking at how things may fall apart. It is also rare for historians to take up a story as complex as this one, with a cast of thousands and crucial events everywhere from Washington committees to details of magnet design. Yet the challenges were met, and the book is well organized (aside from minor bits of repetition) and well written. It is, to be sure, an academic history with the participants appearing simply as names, absent the colorful personalities that a journalist would have reported. The tale is none the less absorbing. The authors and their helpers have relied largely on oral-history interviews conducted with more than a hundred participants in the story. But they also searched through tons of files and countless publications, producing comprehensive documentation. They have synthesized their findings in a compact, engaging, and impressively frank narrative. While much has been written about the SSC, this is the definitive account. "Tunnel Visions" is worth the attention of all scientists, science administrators, and indeed everyone who wants to know how pioneering science may or may not be conducted in our times.

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