NATIONAL PARK SERVICE • U.S. DEPARTMENT OF THE INTERIOR

Foundation Document Overview

Manhattan Project National Historical Park

New Mexico, Tennessee, Washington

Contact Information

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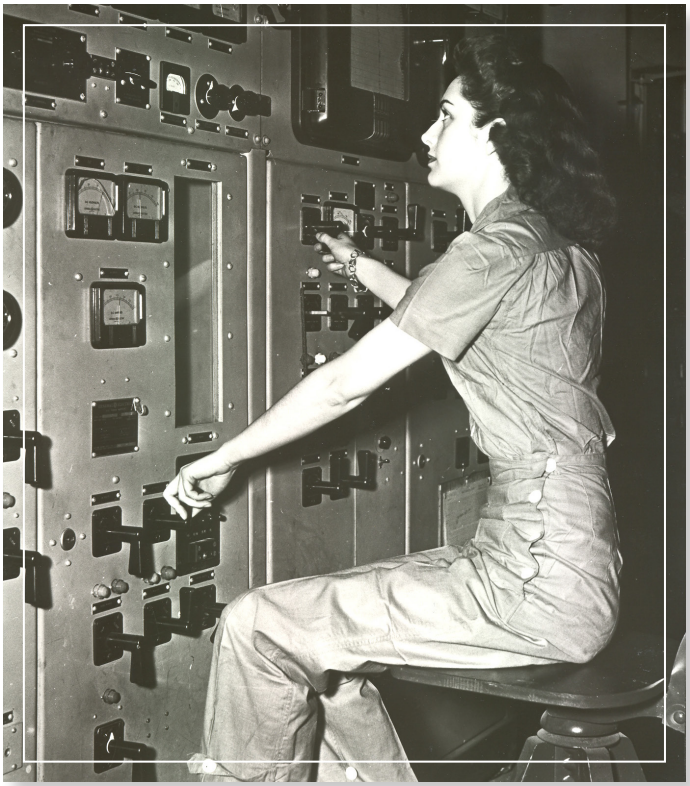
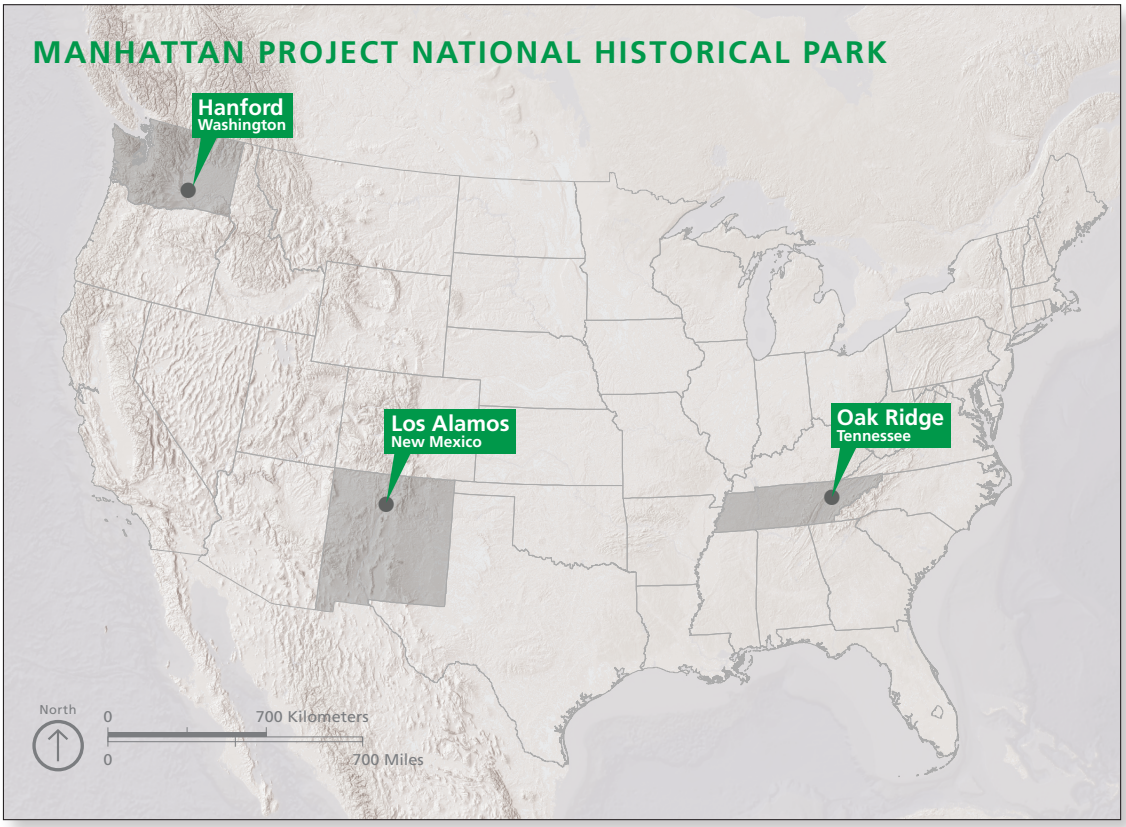
Description

Established on November 10, 2015, Manhattan Project National Historical Park preserves, interprets, and facilitates access to key historic resources associated with the Manhattan Project. The Manhattan Project was a massive, top-secret national mobilization of scientists, engineers, technicians, and military personnel charged with producing a deployable atomic weapon during World War II. It resulted in the first successful test of an atomic device on July 16, 1945, a few weeks before the United States dropped atomic bombs on Hiroshima and Nagasaki, Japan. Coordinated by the U.S. Army, Manhattan Project activities took place in numerous locations across the United States. The park is managed through a collaborative partnership by the National Park Service and the U.S. Department of Energy, and incorporates three of the Manhattan Project's most significant locations: Oak Ridge, Tennessee; Los Alamos, New Mexico; and Hanford, Washington.



The unprecedented scientific and industrial activities of the Manhattan Project displaced many communities with thousands of people to make way for the rapid construction of Manhattan Project infrastructure. In addition to its industrial plants, the U.S. government built large residential neighborhoods to support the tens of thousands of workers who moved to these sites to support the project. In these isolated, fenced and gated "secret" cities, access and activities were tightly monitored. Work on the sites was compartmentalized in the name of security, with the majority unaware that they were part of developing the world's first nuclear weapons.



Description

Oak Ridge, Tennessee

The Clinton Engineer Works in Oak Ridge, Tennessee, served as the administrative headquarters for the Manhattan Project and also produced the enriched uranium used in the "Little Boy" gun-type bomb. Enrichment increases the concentration of the fissile uranium-235 isotope to a level suitable for weapons use. Due to wartime urgency, scientists at Oak Ridge developed multiple processes for uranium enrichment, and several sites and structures that supported these processes are incorporated into the park. These include buildings 9731 and 9204-3, which housed large arrays or "racetracks" of calutrons that separated uranium isotopes with electromagnets, as well as the site of the enormous K-25 plant (since demolished) which separated uranium isotopes using gaseous diffusion. Oak Ridge is also home to the X-10 Graphite Reactor National Historic Landmark, the world's first continuously operating nuclear reactor that demonstrated the production of plutonium in pilot scale.

Los Alamos, New Mexico

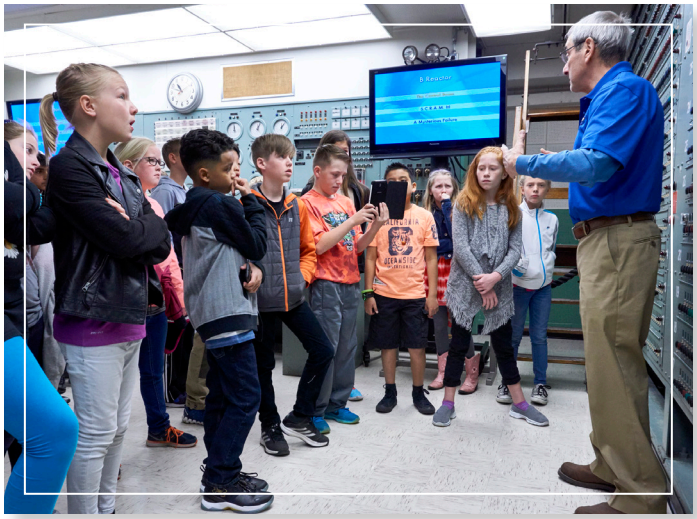
The Manhattan Project established a laboratory at remote Los Alamos to foster collaboration among prominent scientists, engineers, technicians, and support personnel in the design and fabrication of the first nuclear weapons. The park includes structures located at three sites on the grounds of present-day Los Alamos National Laboratory. Pajarito Site includes the Battleship Bunker, the Slotin Building, and the Pond Cabin, all of which supported implosion testing and criticality research. V-Site consists of two buildings used to assemble the high-explosives sphere for the "Gadget" detonated at the Trinity Test and to support the assembly of the "Fat Man" bomb, both of which used the implosion method and a plutonium core. Gun Site contains three bunkered buildings and a portable guard shack. The site supported the development and final assembly of the "Little Boy" uranium bomb, which used the "gun" method as opposed to implosion.

Hanford, Washington

The Hanford Engineer Works produced plutonium on an industrial scale. Its isolated location offered a margin of safety given the dangerous nature of its activities and the nearby Columbia River provided cooling water for its powerful nuclear reactors. Just 18 months after the start of construction, Hanford had produced the plutonium used in the Trinity Test and the "Fat Man" implosion-type bomb. The park includes the B Reactor National Historic Landmark, as well as the pre-war Hanford High School, Bruggemann's Agricultural Warehouse, White Bluffs Bank, and Hanford Irrigation District Pump House, which together provide perspective on the sacrifices made for the Manhattan Project.

Visitor Access

The National Park Service and Department of Energy will work with American Indian Tribes, descendants of displaced community members, other organizations, and members of the general public who are interested in the park's development. Due to ongoing national security requirements and cleanup activities, some sites included in the park are not currently accessible to the general public, and other park sites are accessible only via organized bus tours. Other sites remain eligible for inclusion in the park, but have not yet been added. As part of their ongoing collaboration, the National Park Service and the Department of Energy will endeavor to develop innovative and virtual approaches to connect park visitors with key resources, as they work to expand safe physical access to them.



Purpose

Managed in partnership by the Department of Energy and the National Park Service, Manhattan Project National Historical Park preserves and interprets the nationally significant historic sites, stories, and legacies associated with the top-secret race to develop an atomic weapon during World War II, and provides access to these sites consistent with the mission of the Department of Energy.

Significance

Significance statements express why Manhattan Project National Historical Park resources and values are important enough to merit national park unit designation. Statements of significance describe why an area is important within a global, national, regional, and systemwide context. These statements are linked to the purpose of the park unit, and are supported by data, research, and consensus. Significance statements describe the distinctive nature of the park and inform management decisions, focusing efforts on preserving and protecting the most important resources and values of the park unit.

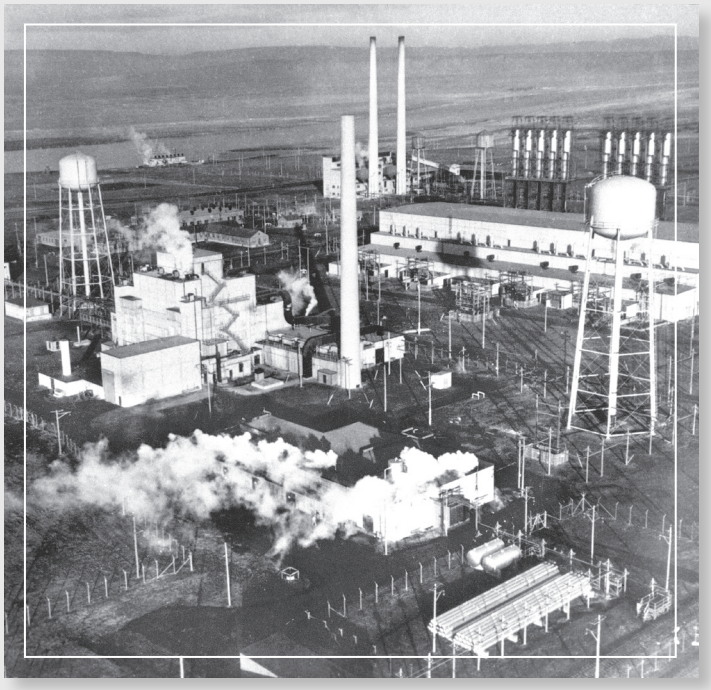
- The Manhattan Project was an unprecedented, top-secret World War II government program in which the United States rushed to develop and deploy atomic weapons before Nazi Germany. The use of these weapons by the United States against Japan in August 1945 ultimately became one of the most important historical events of the 20th century.
- During the Manhattan Project, the U.S. Army directly or indirectly employed nearly 600,000 workers and some of the world's leading scientists at more than 30 sites nationwide, including three primary centers of operations established at Oak Ridge, Tennessee; Los Alamos, New Mexico; and Hanford, Washington. This effort channeled revolutionary scientific and engineering innovations into an entirely new kind of weapon, ushering in the nuclear age.

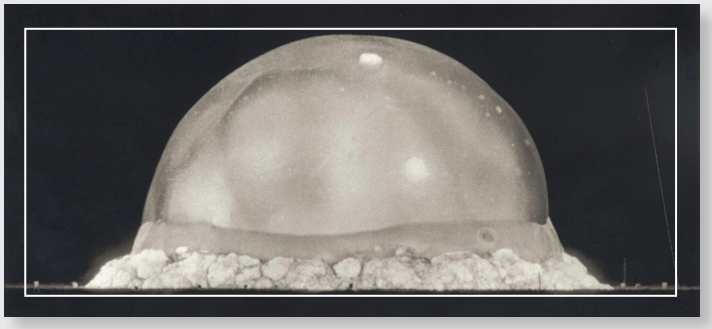
Significance

- Initially identified as the primary location for the Manhattan Project, the Oak Ridge Reservation eventually produced enriched uranium and housed the management of the nationwide project. Three revolutionary enrichment processes were developed and implemented simultaneously at the reservation, where thousands worked in cavernous industrial facilities to produce incremental amounts of weapons-grade uranium. Oak Ridge provided the fissile material for the "Little Boy" atomic weapon dropped on Hiroshima, Japan, on August 6, 1945.

- Los Alamos became the location where world-renowned scientists and engineers led by J. Robert Oppenheimer gathered in laboratories to design and develop the world's first atomic weapons. Merely 26 months after the start of the project, the Los Alamos team conducted the first successful nuclear test at the Trinity Site in southern New Mexico on July 16, 1945, and assembled the two atomic weapons the United States dropped on Japan in August 1945.

- At a massive industrial complex at Hanford, Washington, the United States engineered and built the world's first full-scale nuclear reactor, uranium fuel fabrication facilities, and plutonium separation plant in only 18 months. Hanford's facilities produced the plutonium used in the first successful test of a nuclear device at Trinity Site, and the "Fat Man" plutonium bomb dropped on Nagasaki, Japan, on August 9, 1945.





- The wartime urgency surrounding the Manhattan Project led to the displacement of generations-old settlements and tribal communities as many people were forced to sacrifice homes, lands and waters, sacred sites, and the access to sacred sites to make way for covert military industrial sites and communities.

- The two atomic weapons used by the United States on the Japanese cities of Hiroshima and Nagasaki unleashed an enormous and unprecedented amount of death and devastation for an individual weapon. An estimated 90,000–166,000 people were killed or died within months after the United States bombed Hiroshima using the "Little Boy" uranium bomb on August 6, 1945. An estimated 60,000–80,000 people were killed or died within months after the United States bombed Nagasaki using the "Fat Man" plutonium bomb three days later.

- The colossal destructive power of nuclear weapons became a fundamental dynamic of the ensuing Cold War between the United States and the Soviet Union, a concept commonly referred to as deterrence through Mutual Assured Destruction, and spurred other nations to develop nuclear weapons of their own.

- The development and production of nuclear weapons in the United States and around the world has had profound consequences for human health and the environment, from radiation exposure from the use and testing of nuclear weapons to the chemical and radiological waste that remains from decades of nuclear weapons development.

- Scientific and technological advances made during the Manhattan Project in the pursuit of nuclear weapons contributed to progress in many areas, such as environmental and materials science, biology, nuclear medicine, nuclear energy, the nuclear Navy, supercomputing, precision machining, astronomy, and the Department of Energy's National Laboratory System.

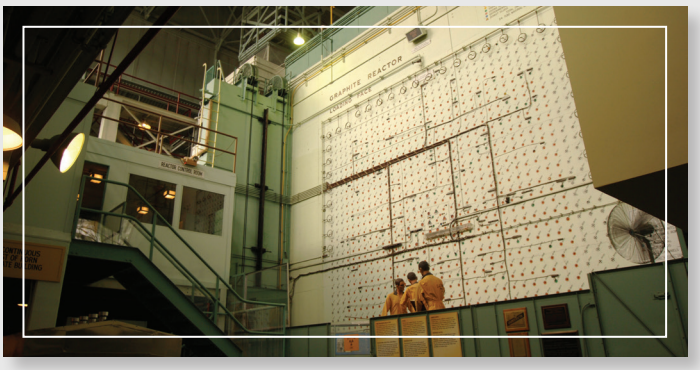
Fundamental Resources and Values

Fundamental resources and values are those features, systems, processes, experiences, stories, scenes, sounds, smells, or other attributes determined to merit primary consideration during planning and management processes because they are essential to achieving the purpose of the park and maintaining its significance.

Oak Ridge, Tennessee

- **K-25 Building Site.** The gaseous diffusion method for uranium enrichment was pioneered at an industrial scale at the K-25 building. Built in March 1945, the mammoth 44-acre building produced enriched uranium feed material for the Y-12 electromagnetic separators for further enrichment, including some of the uranium used in the "Little Boy" weapon that was dropped on Hiroshima. The U-shaped building, which measured a half-mile long and 1,000 feet wide, continued to produce highly enriched uranium used in thermonuclear weapons during the Cold War until production ceased in 1964. The K-25 building has since been demolished, and its footprint will remain undeveloped.

- **X-10 Graphite Reactor.** The world's first continuously operating nuclear reactor, the X-10 Graphite Reactor produced the first significant amounts of plutonium ever made and served as a proof of concept for the B Reactor at Hanford. The engineered reactor is a "pile" of graphite blocks measuring 24 feet per side, penetrated by horizontal air-cooled channels that contained the uranium fuel slugs. The graphite blocks served as a neutron moderator, which helped to sustain a nuclear chain reaction. Designed and built in less than 10 months, it went into operation on November 4, 1943. After the war, X-10 was used for a wide variety of scientific purposes, including the production of radioisotopes, until being shut down in 1963. Today, the reactor face and control room are accessible to the public. The reactor building is a national historic landmark.



- **Y-12 Plant Buildings 9731 and 9204-3.** The electromagnetic separation method for uranium enrichment was pioneered at industrial scale in Buildings 9731 and 9204-3 at the Y-12 National Security Complex, and these buildings produced the final highly enriched uranium used in the "Little Boy" bomb. Building 9731 was the first building constructed at the Y-12 site, and contains the world's only three alpha calutron magnets as well as three beta calutron magnets. These calutrons were used as test beds for the rest of the Y-12 complex. Building 9204-3 contains the last two remaining Beta racetracks in America. One of these racetracks was in use as recently as 1998 for the separation of stable isotopes, and remains on standby for potential future use.

Los Alamos, New Mexico

- **Pond Cabin (TA-18-29).** The Pond Cabin (TA-18-29), a log structure, was built in 1914 by settler Ashley Pond and supported Emilio Segrè's plutonium fission research. The Pond Cabin is at the Pajarito Site, in Pajarito Canyon, on the Los Alamos National Laboratory grounds.

- **Battleship Bunker (TA-18-2).** The Battleship Control Building was constructed to support implosion diagnostic tests for the plutonium implosion-type bomb design. A cast-in-place concrete bunker, it is known as the "battleship building" because the west end of the building is shaped like a bow of a ship, shielded with a steel plate. This Battleship Control Building is at the Pajarito Site, in Pajarito Canyon, on the Los Alamos National Laboratory grounds.

- **Slotin Building (TA-18-1).** The Slotin Building was constructed at the end of the Manhattan Project. It was the location of the criticality accident that led to the death of scientist Louis Slotin. The accident significantly influenced future criticality safety programs. The building remained in use during the Cold War. The Slotin Building is at the Pajarito Site, in Pajarito Canyon, on the Los Alamos National Laboratory grounds.

- **Gun Site Buildings.** The Gun Site area of Los Alamos was used during World War II to test the gun-type weapon designs known as "Thin Man" and "Little Boy." Gun Site buildings consist of three concrete, earth-covered bunkers (Laboratory and Shop [TA-8-1], Shop and Storage [TA-8-2], Diesel Generator Building [TA-8-3]) and a portable guard shack (TA-8-172). Components of "Little Boy" were also assembled at the Gun Site before being shipped to the Pacific.

- **V-Site.** The V-Site buildings include the Assembly Building (High Bay) (TA-16-516) and Workshop (TA-16-517), and were constructed to support the assembly of the plutonium implosion-type bomb. They were also used to assemble the high-explosives sphere for the Trinity device, known as the Gadget. V-Site buildings in use during the war also included several storage and shop buildings that were destroyed by the Cerro Grande Fire in May of 2000. The V-Site was located well away from other facilities at Los Alamos, for safety as well as security reasons.

Hanford, Washington

- **B Reactor.** The B Reactor is the first full-scale production nuclear reactor in the world. Together with the D and F Reactors, the B Reactor produced the plutonium used in the Trinity Test and the "Fat Man" bomb dropped on Nagasaki, Japan. The reactor's core consists of a "pile" of graphite blocks which held uranium fuel slugs and served as a neutron moderator, sustaining a nuclear chain reaction. B Reactor is a national historic landmark and is accessible via guided tours. Also located on the B Reactor grounds are two locomotives and two cask cars, part of the rail system that hauled irradiated fuel rods from Hanford's reactors to the storage and chemical separation buildings for processing.

- **Hanford High School.** Hanford High School was a focal point of the pre-Manhattan Project community of Hanford, Washington. The school was vacated when the town of Hanford was condemned for the Manhattan Project, and was used for a short time as office space. Only the outer shell of the original structure remains intact. The current property within the park also includes a small portion of the Hanford Construction Camp, where more than 50,000 workers lived in tents and barracks during the construction of the Hanford Engineer Works.

- **White Bluffs Bank.** The White Bluffs Bank building is the only remaining structure of the pre-Manhattan Project community of White Bluffs, Washington. When first constructed, it was claimed to be robbery-proof, though it was robbed twice in its operating history due to an easily breached wooden roof. The bank building, a small 25-foot by 30-foot single-story concrete block structure, is currently undergoing a comprehensive rehabilitation to replicate the period appearance and facilitate public visitation.

- **Bruggemann's Agricultural Complex Warehouse.** Located within two miles of the B Reactor, the warehouse building at Bruggemann's Agricultural Complex is the only remaining structure on the approximately 530-acre farm property that was condemned by the federal government. The structure is part of one of the few intact independent farming operations representing the pre-Manhattan Project era in the Northwest. The warehouse itself is a unique structure constructed of Columbia River cobblestone placed into a concrete matrix. While the facility itself is behind a fence awaiting stabilization and improvements, visitors can walk around it on existing roads.

- **Hanford Irrigation District Pump House.** The Hanford Irrigation District Pump House, also known as the "Allard" Pump House, was built by the Hanford Irrigation and Power Company to raise water more than 50 feet to a 36-mile irrigation network for farms in the Priest Rapids Valley. When completed, area newspapers called the project "the largest pumping plant in the world." The project enabled large scale farming and orchards in the area, which in turn supported individual farms and community business in the towns of Hanford and White Bluffs. The building shell and roof of the pump house are intact.

Interpretive Themes

Interpretive themes are often described as the key stories or concepts that visitors should understand after visiting a park—they define the most important ideas or concepts communicated to visitors about a park unit. Themes are derived from—and should reflect—park purpose, significance, resources, and values. The set of interpretive themes is complete when it provides the structure necessary for park staff to develop opportunities for visitors to explore and relate to all of the park significances and fundamental resources and values.

- The "secret cities" created for the Manhattan Project, and the sacrifice and displacement connected to them, exemplified this massive wartime effort and demonstrate remarkable opportunities to reflect on the extraordinary lengths to which people and nations go to protect their futures.
- The revolutionary science and engineering that fueled the race to create the world's first atomic weapon make these places a powerful illustration of technological innovation and collaboration, and offer guidance and insight into solving today's complex problems.
- From beginning to end, the Manhattan Project, its World War II context, and the many complex decisions that led to the incomprehensible destructive power of nuclear weapons prompts us to confront the profound choices and consequences that the world continues to struggle with today.
- The Manhattan Project thrust humanity into the nuclear age and forever changed the world, provoking consideration of dramatic scientific and technological advances as well as severe human costs and environmental consequences.