

LOS ALAMOS
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GUARDS

NATIONAL SECURITY RESEARCH CENTER





Los Alamos
NATIONAL LABORATORY

A Brief History of the Lab at Los Alamos

NATIONAL SECURITY



RESEARCH
CENTER

Nic Lewis
NSRC Historian

LA-UR-21-25735

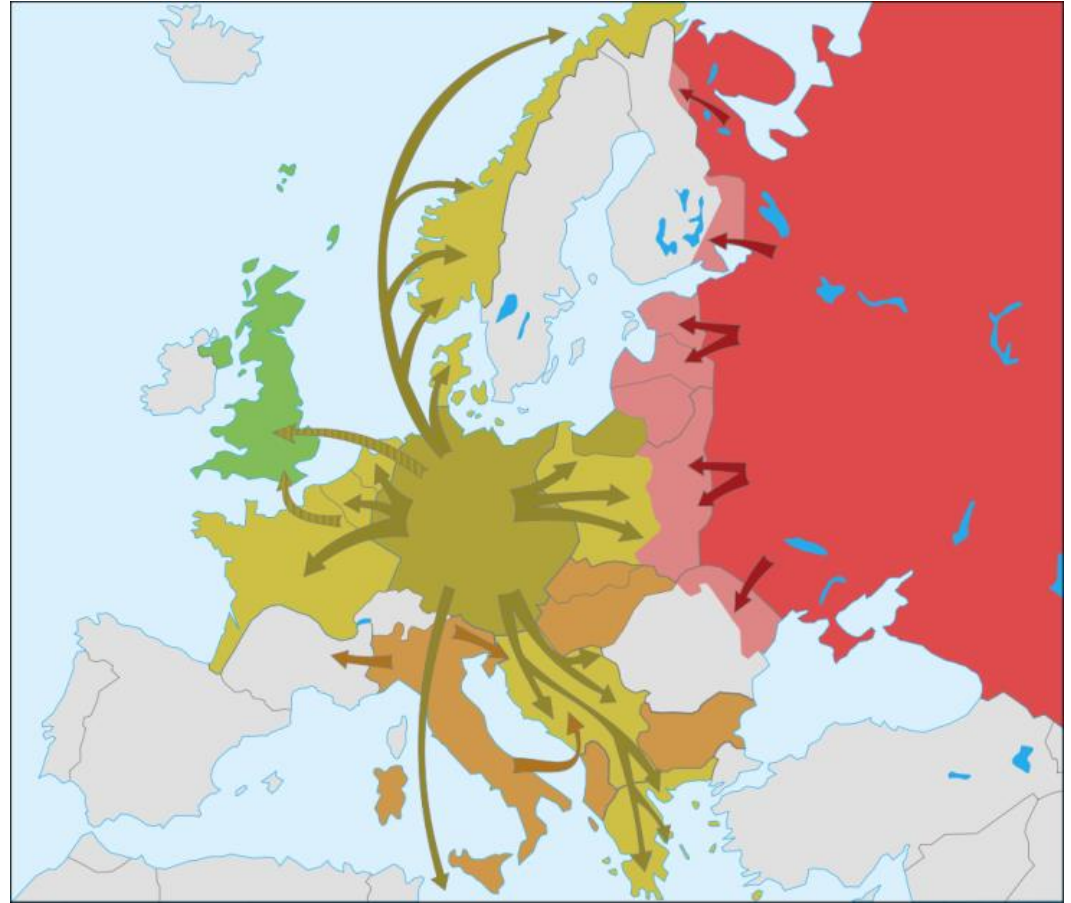


Managed by Triad National Security, LLC for the U.S. Department of Energy's NNSA

The World at War



Hitler, Stalin, and Europe at War.



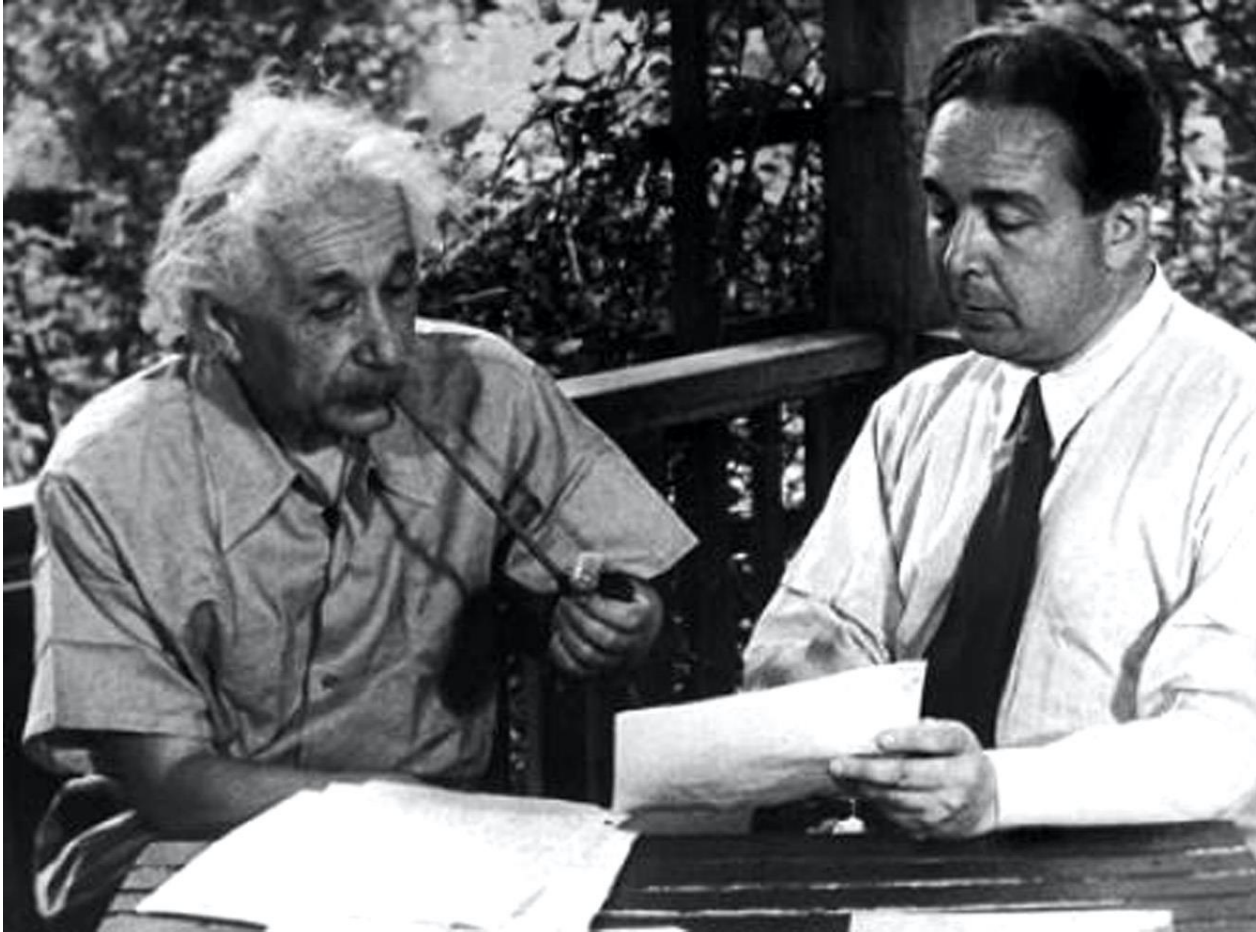
The World at War



The attack on Pearl Harbor.

Changing Priorities

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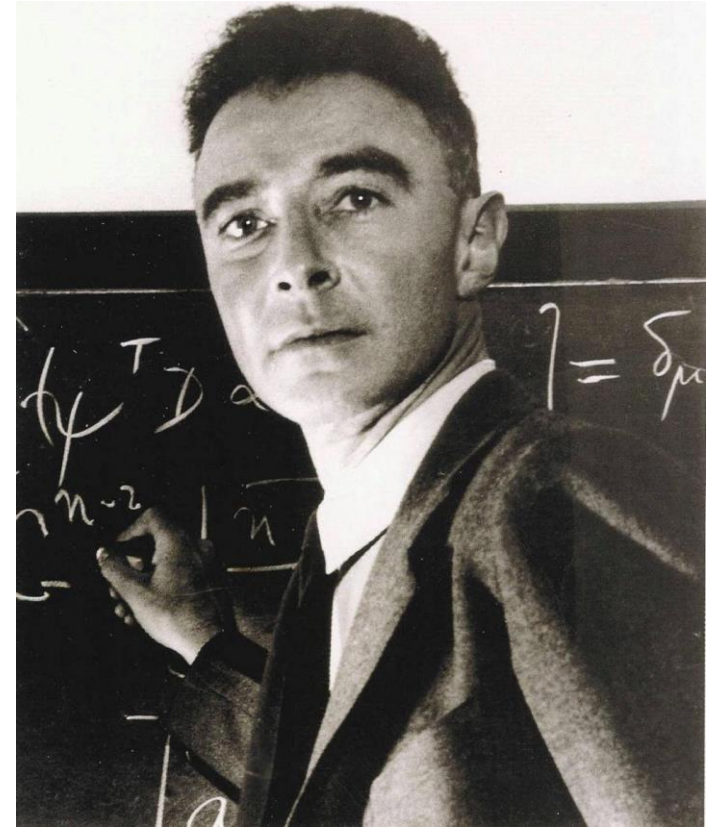


Einstein
and Leo Szilard.

Beginning of the Manhattan Project



Vannevar Bush



J. Robert Oppenheimer

Beginning of the Manhattan Project



Wartime Los Alamos was known as Project Y.



Leslie Groves and the major sites of the Manhattan Project

Los Alamos at War

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CIC-9, ON99-119

Los Alamos at War

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Ashley Pond
before Project Y.

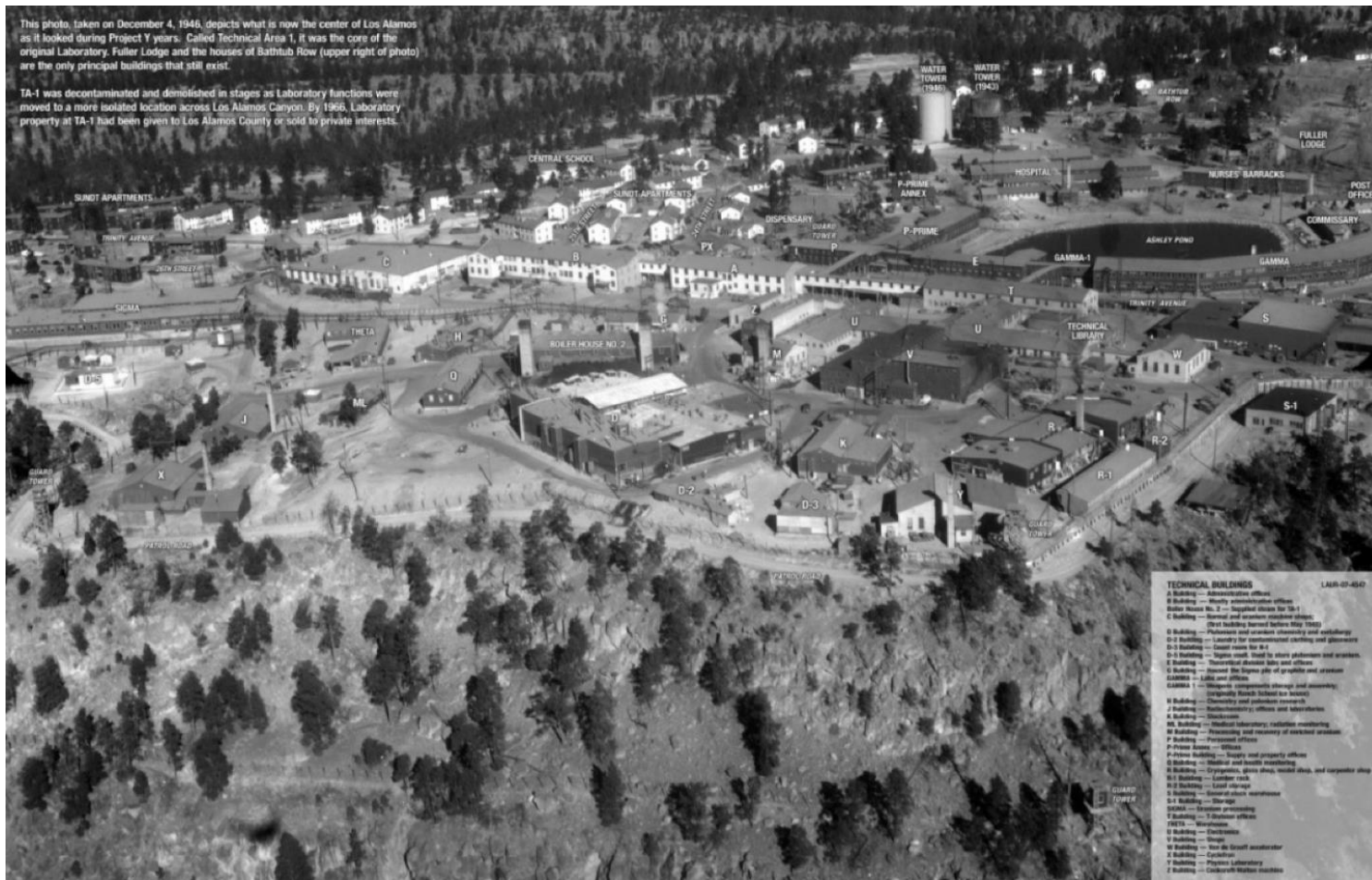
Los Alamos at War

PROJECT Y
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This photo, taken on December 4, 1946, depicts what is now the center of Los Alamos as it looked during Project Y years. Called Technical Area 1, it was the core of the original Laboratory. Fuller Lodge and the houses of Bathtub Row (upper right of photo) are the only principal buildings that still exist.

TA-1 was decontaminated and demolished in stages as Laboratory functions were moved to a more isolated location across Los Alamos Canyon. By 1966, Laboratory property at TA-1 had been given to Los Alamos County or sold to private interests.



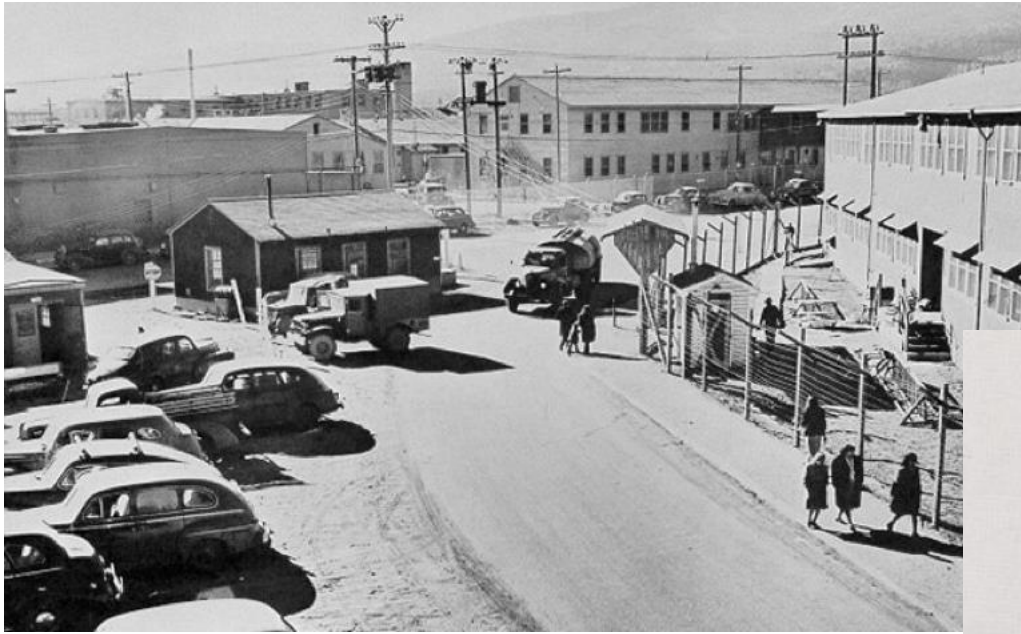
- TECHNICAL BUILDINGS** LA-10-4547
- A Building — Administrative offices
 - B Building — mostly administrative offices
 - Boiler House No. 2 — Hospital clinic for TA-1
 - C Building — General and academic machine shops (Old building burned before May 1945)
 - D Building — Plutonium and uranium chemistry and cyclotron
 - D-1 Building — Laboratory for experimental chemistry and geophysics
 - D-2 Building — Isotope work, used to store plutonium and uranium
 - D-3 Building — Theoretical atomic life and offices
 - D-4 Building — General laboratory for all problems and uranium
 - D-5 Building — Life and offices
 - GAMMA-1 — Biological components storage and assembly (originally French funded for biology)
 - H Building — Chemistry and physical research
 - J Building — Radiochemistry offices and laboratories
 - K Building — Classroom
 - MA Building — Medical laboratory, radiation monitoring
 - M Building — Processing and recovery of enriched uranium
 - P Building — Personnel offices
 - P-Prime Annex — Offices
 - P-Prime Building — Supply and property offices
 - R Building — Medical and health monitoring
 - R-1 Building — Crystalline, glass, stone, metal, steel, and composite shop
 - R-2 Building — Lumber rack
 - S-1 Building — Lead storage
 - S-2 Building — General stock maintenance
 - S-3 Building — Storage
 - S-4 Building — Uranium processing
 - S-5 Building — T-Plutonium offices
 - S-6 Building — Warehouse
 - S-7 Building — Warehouse
 - S-8 Building — Storage
 - S-9 Building — Six to Sixty monitor
 - T Building — Cyclotron
 - V Building — Physics Laboratory
 - W Building — Cookhouse/cafeteria

Los Alamos at War

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The Main Wartime Technical Area.



Los Alamos at War

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Living Conditions on the Mesa.

Los Alamos at War

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Seth Neddermeyer



John von Neumann

Los Alamos at War



Josephine Elliott



Augusta Teller



Kay Manley



Jean Bacher

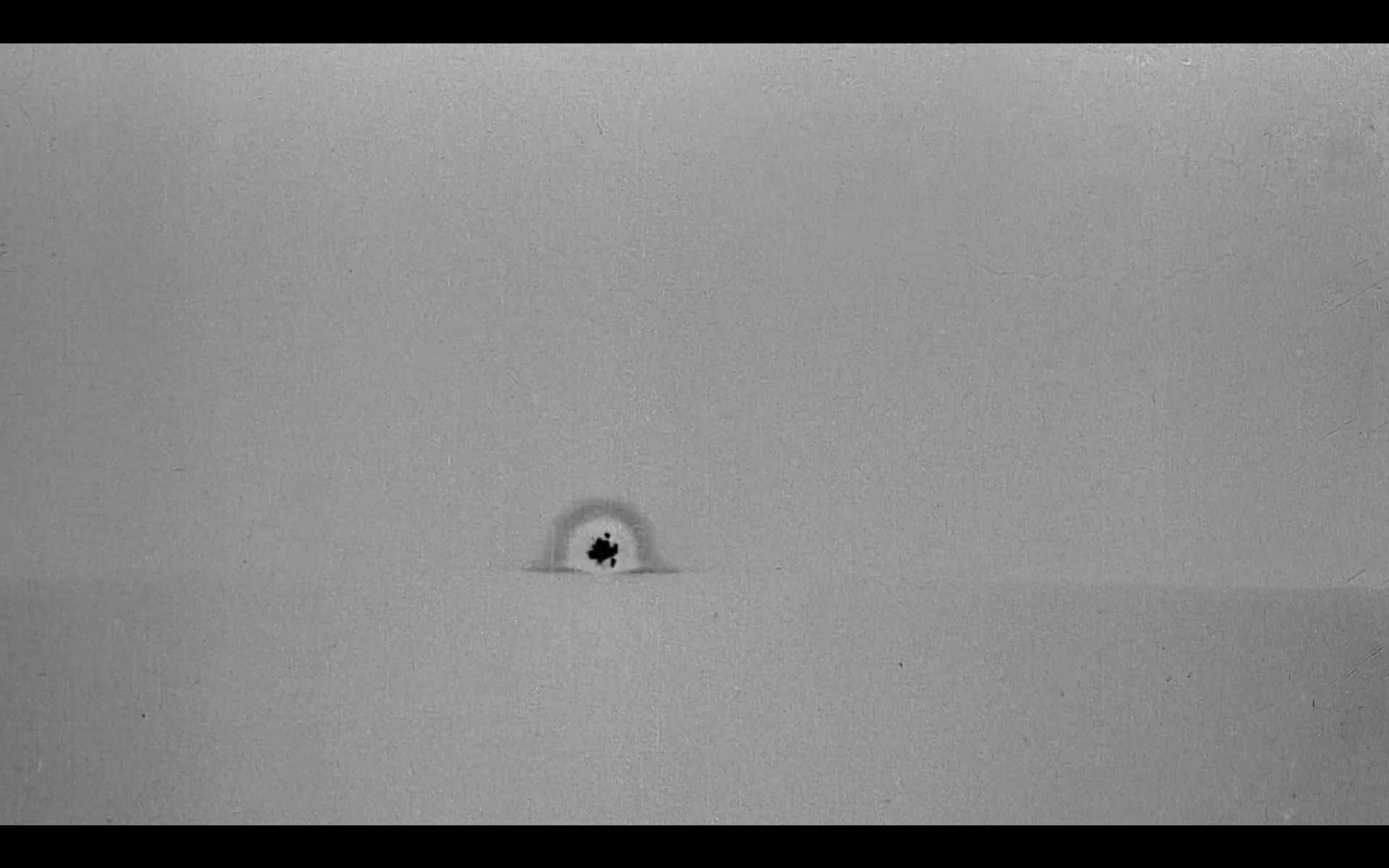


Bernice Brode

Human computers (most of whom were women) conducted calculations essential to Los Alamos' wartime success.



IBM punched-card accounting machines (PCAM) performed large volumes of implosion calculations.



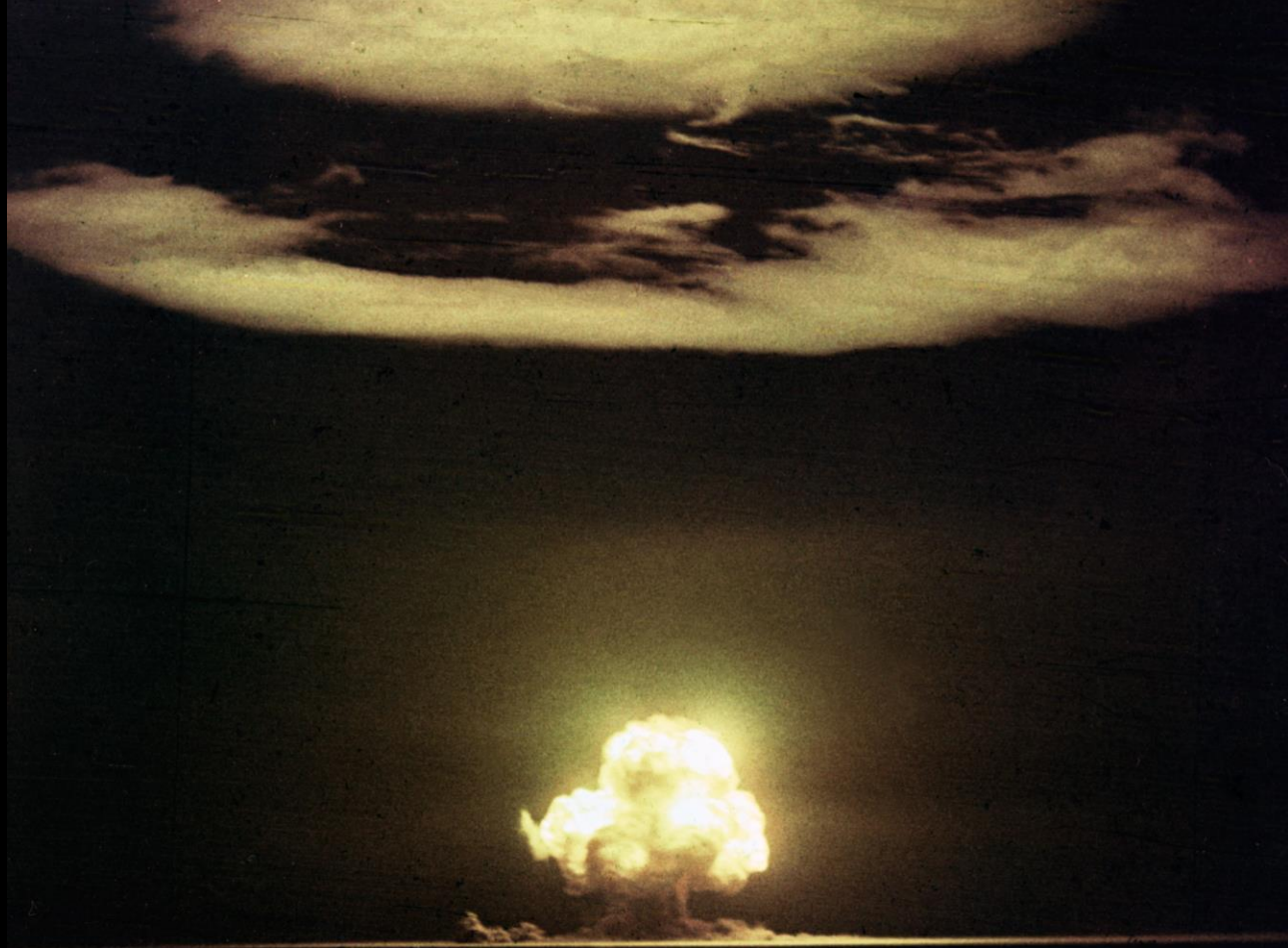


Photo of Trinity Test by Jack Aeby

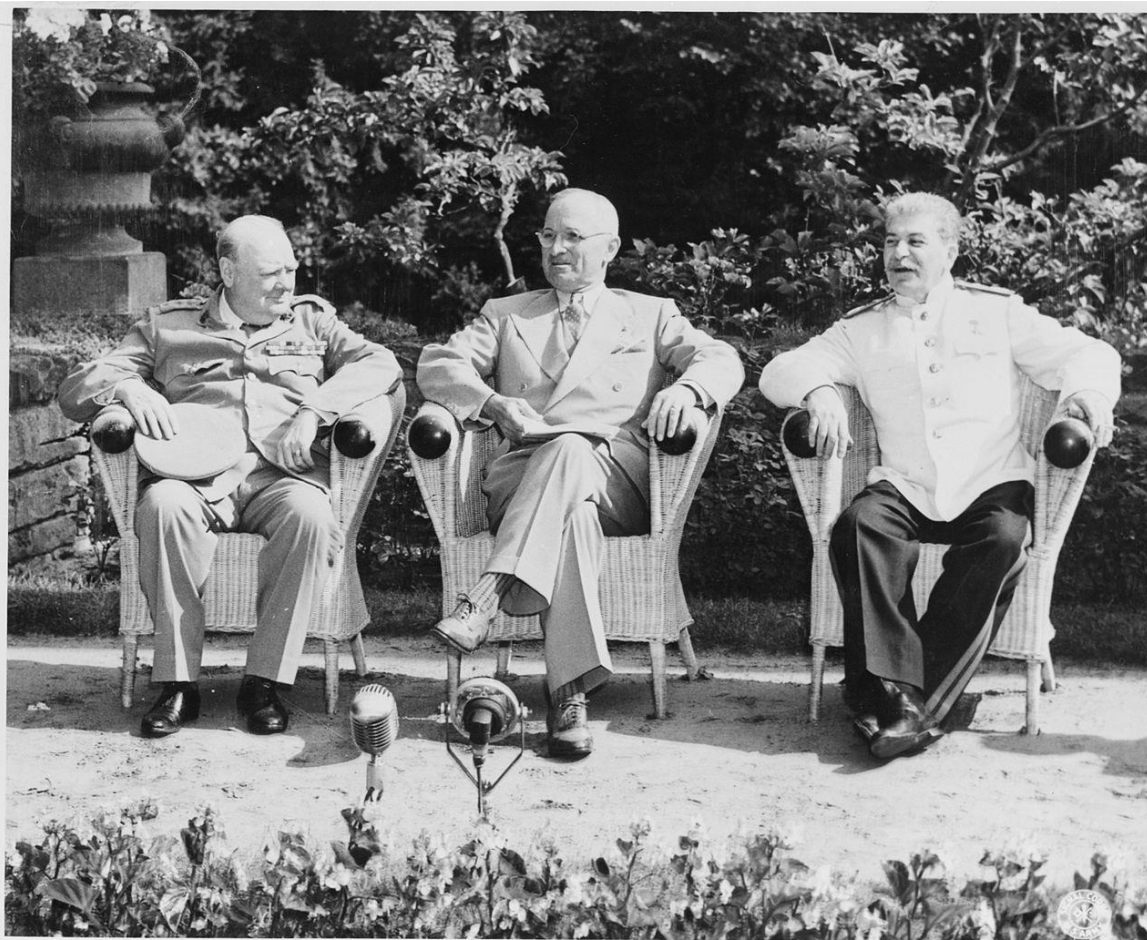
Los Alamos at War

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After Trinity

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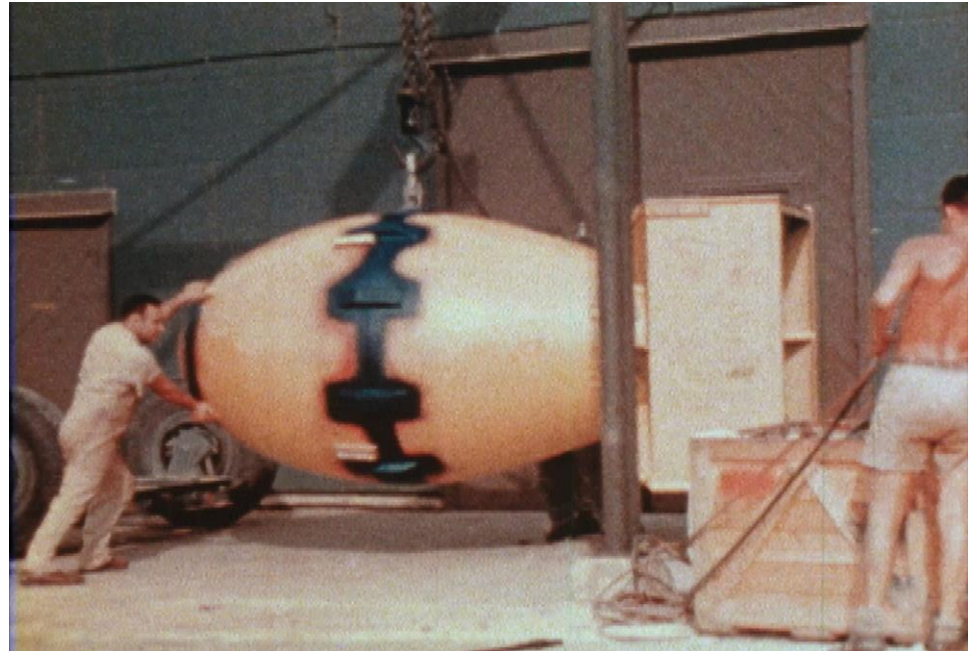
Churchill, Truman, and Stalin at Potsdam Conference.

Hiroshima and Nagasaki

FRONT
MAIN GATE



Little Boy and Fat Man



Hiroshima and Nagasaki

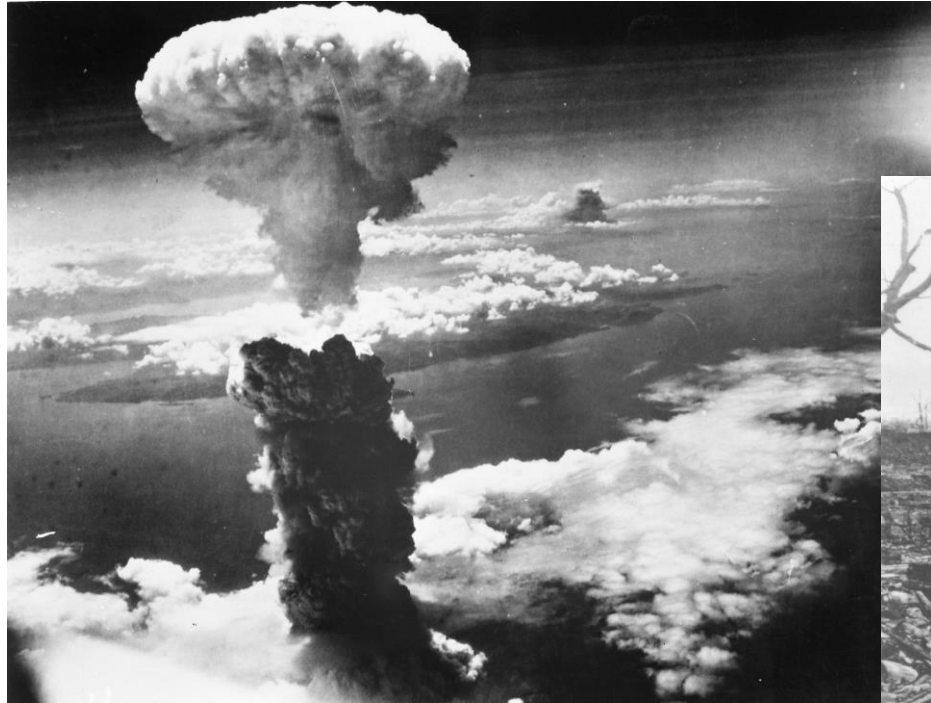
FRONT
MAIN GATE



Aftermath in
Hiroshima

Hiroshima and Nagasaki

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Detonation of Fat Man over Nagasaki,
and its aftermath.



Hiroshima and Nagasaki

FRONT
MAIN GATE



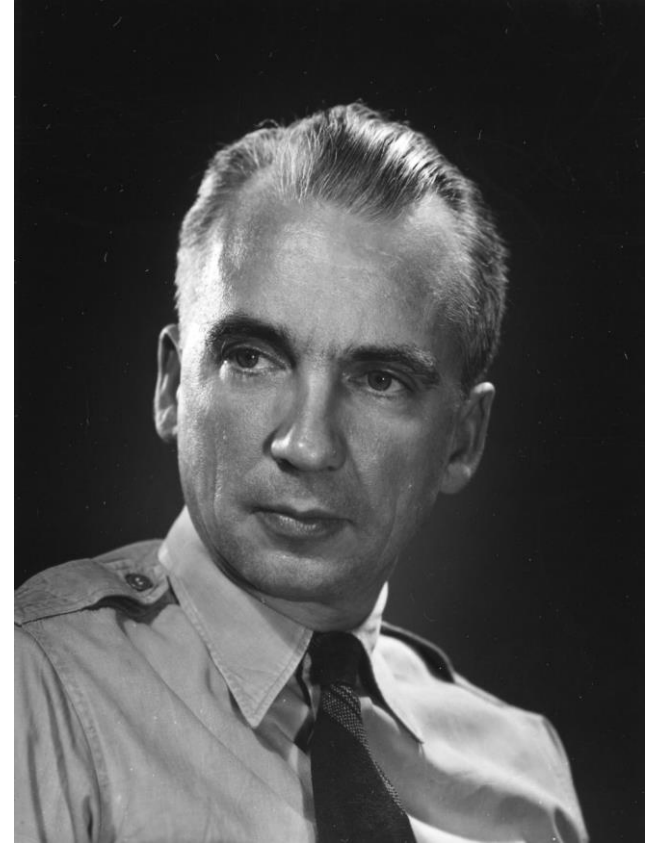
Hiroshima Fatalities: 64,500 had died by mid-November, 1945.

Nagasaki Fatalities: 39,214 had died by mid-November, 1945.

War's End and a New Beginning



Los Alamos received the Army-Navy
“E” Award on October 16, 1945.



Norris Bradbury (Dir. 1945 – 1970)

Postwar Reinvention of Los Alamos



Edward Teller (middle) and Norris Bradbury (right) at Fuller Lodge, 1946.

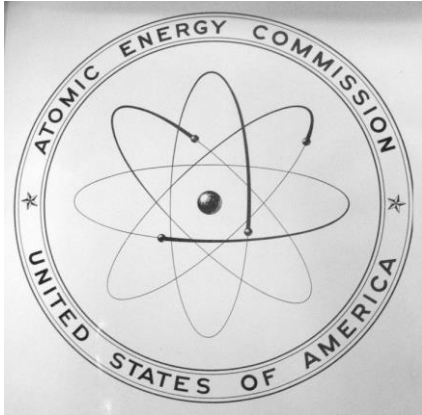
A New Era

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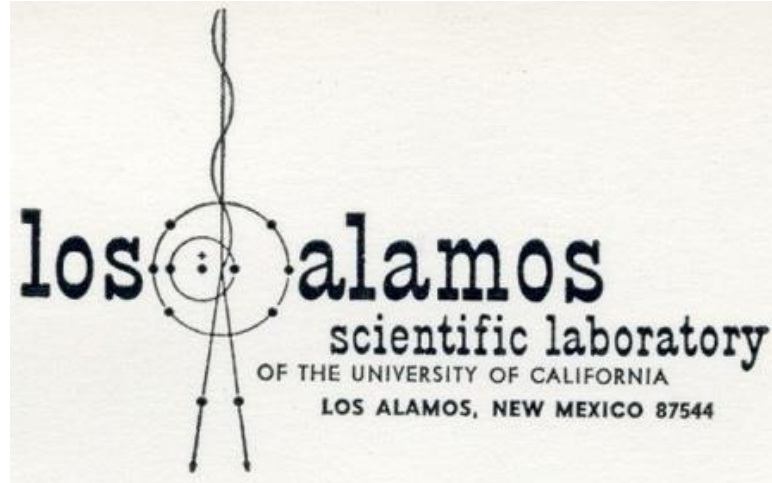


The ENIAC, the first electronic, general-purpose computer, 1945.

A New Era



The Atomic Energy Commission (AEC), 1947-1974.

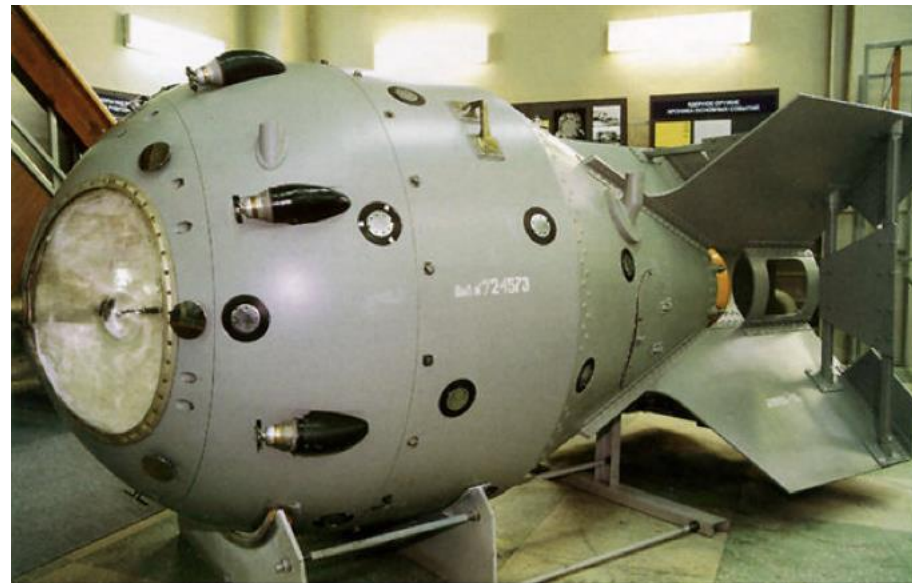


Officially postwar title of “Los Alamos Scientific Laboratory.” The Lab was administered by the University of California during and after the war.



Sandia Labs in Albuquerque was formed in 1948 out of Z Division from Los Alamos.

The Soviet Surprise



RDS-1 ("Joe-1"),
and the first Soviet
nuclear test.

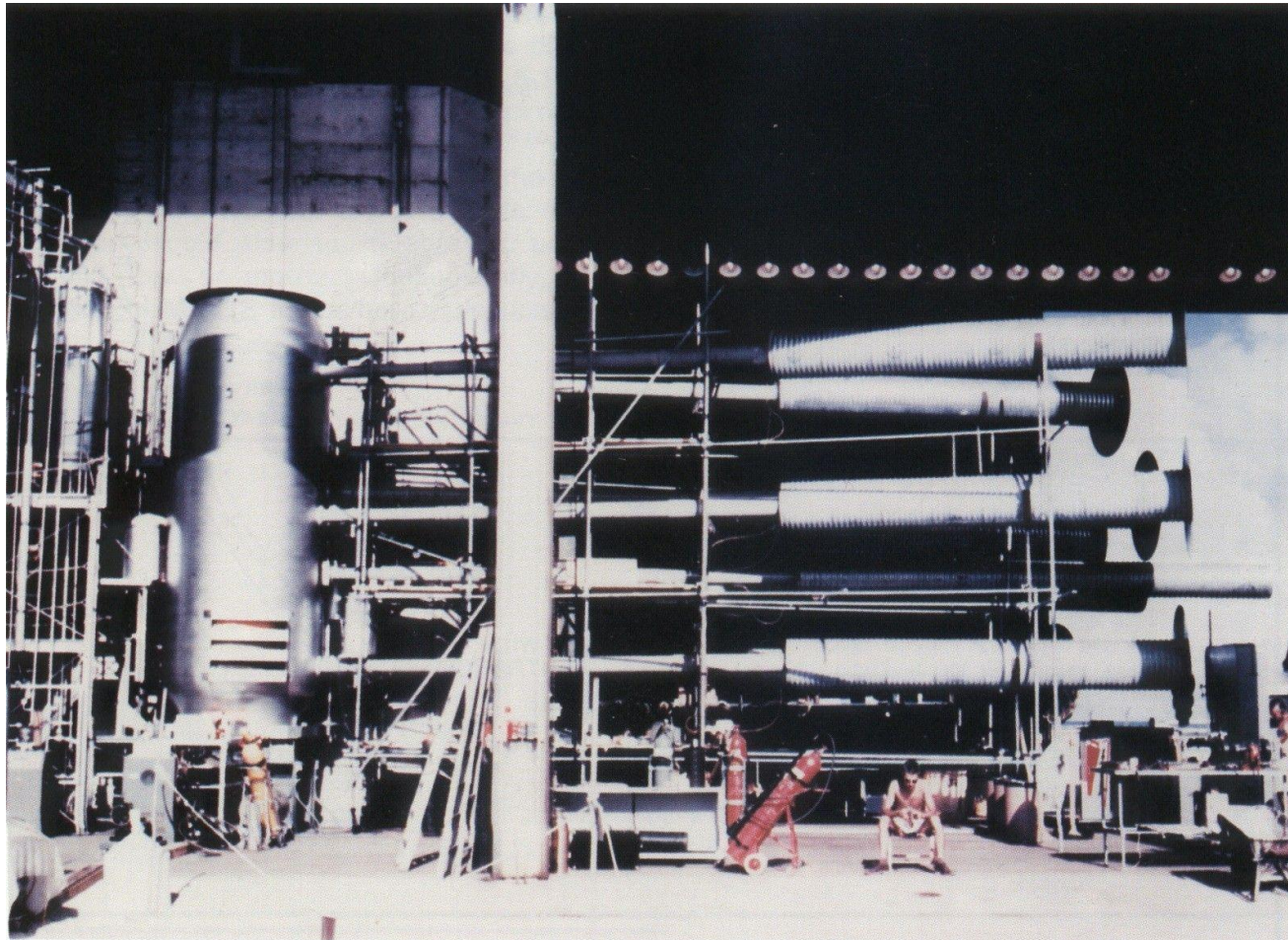


Calculating the Future



The MANIAC,
completed in 1952.

The Thermonuclear Era



The massive Ivy Mike device, with physicist Conrad Longmire seated below for scale.

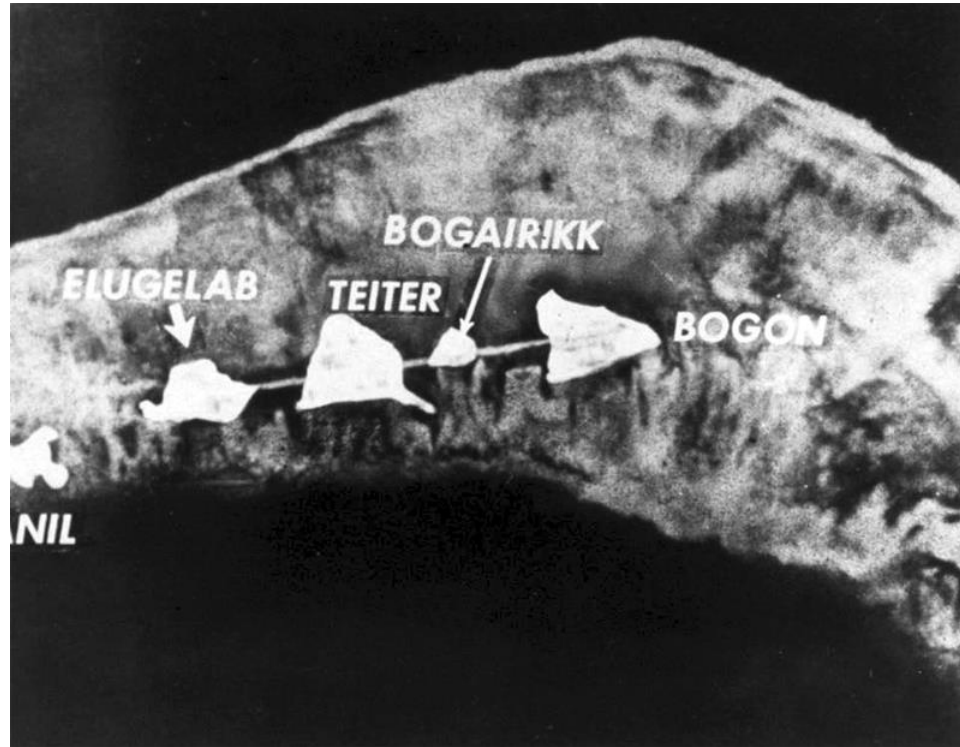
The Thermonuclear Era



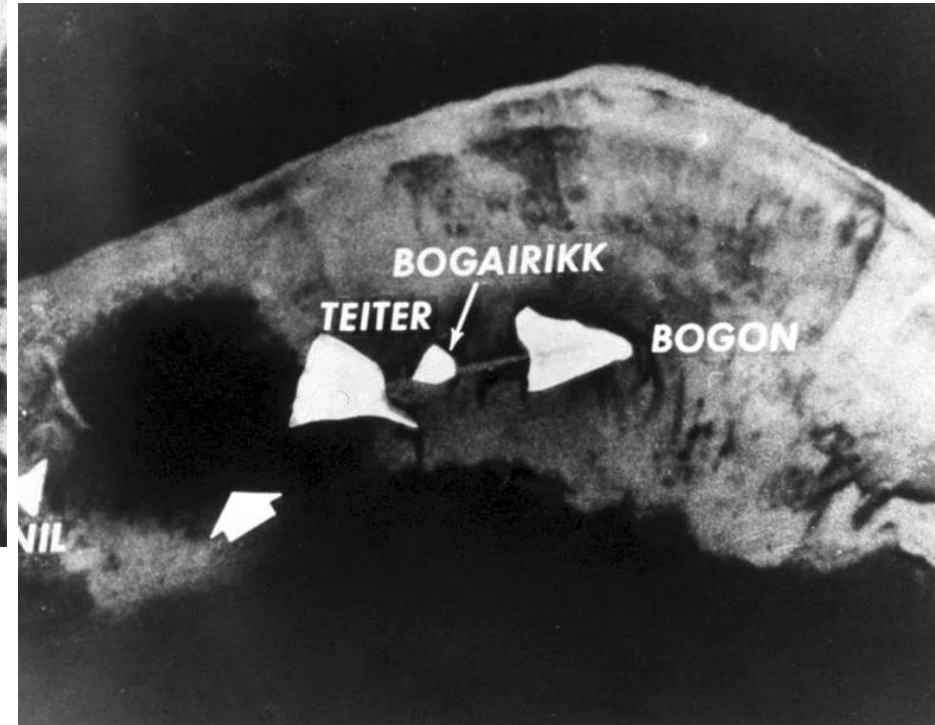
The Ivy Mike Test, November 1, 1952.

The Thermonuclear Era

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Enewetak Atoll before and after Ivy Mike detonation.



The Thermonuclear Era

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The Castle Bravo test of 1954.



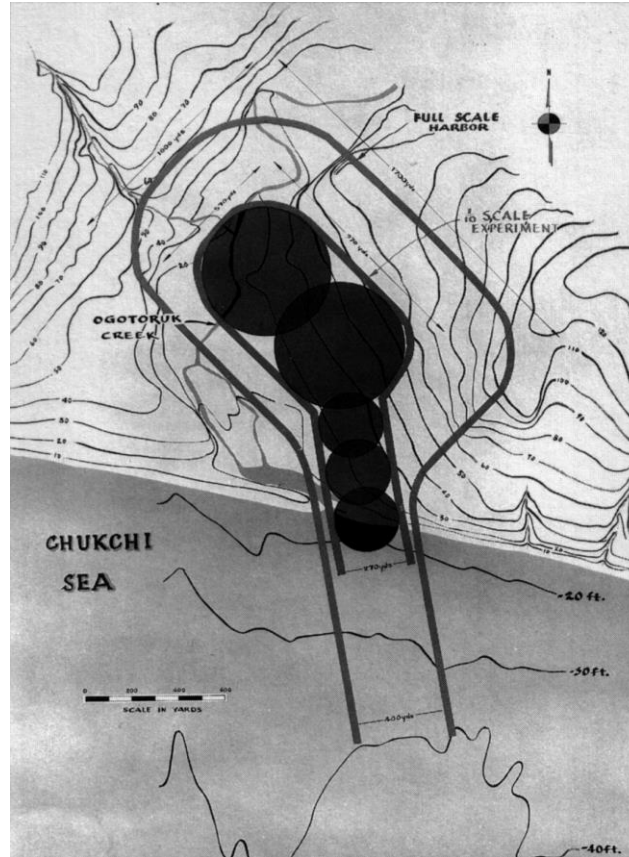
Omega Bridge,
1957.



A Diversifying Mission



Norris Bradbury and the diversification of Lab research.

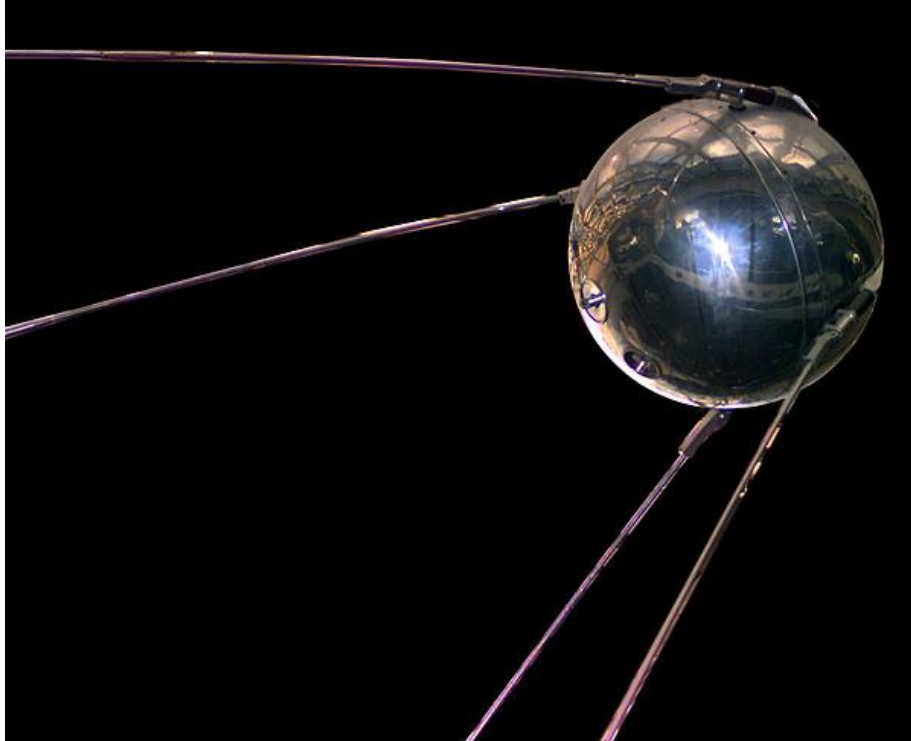


Plowshare proposed harbor excavation.

Project Rover "Kiwi"
A Prime reactor.



The Space Race and its Broader Meanings



Sputnik I,
Launched October 4, 1957.

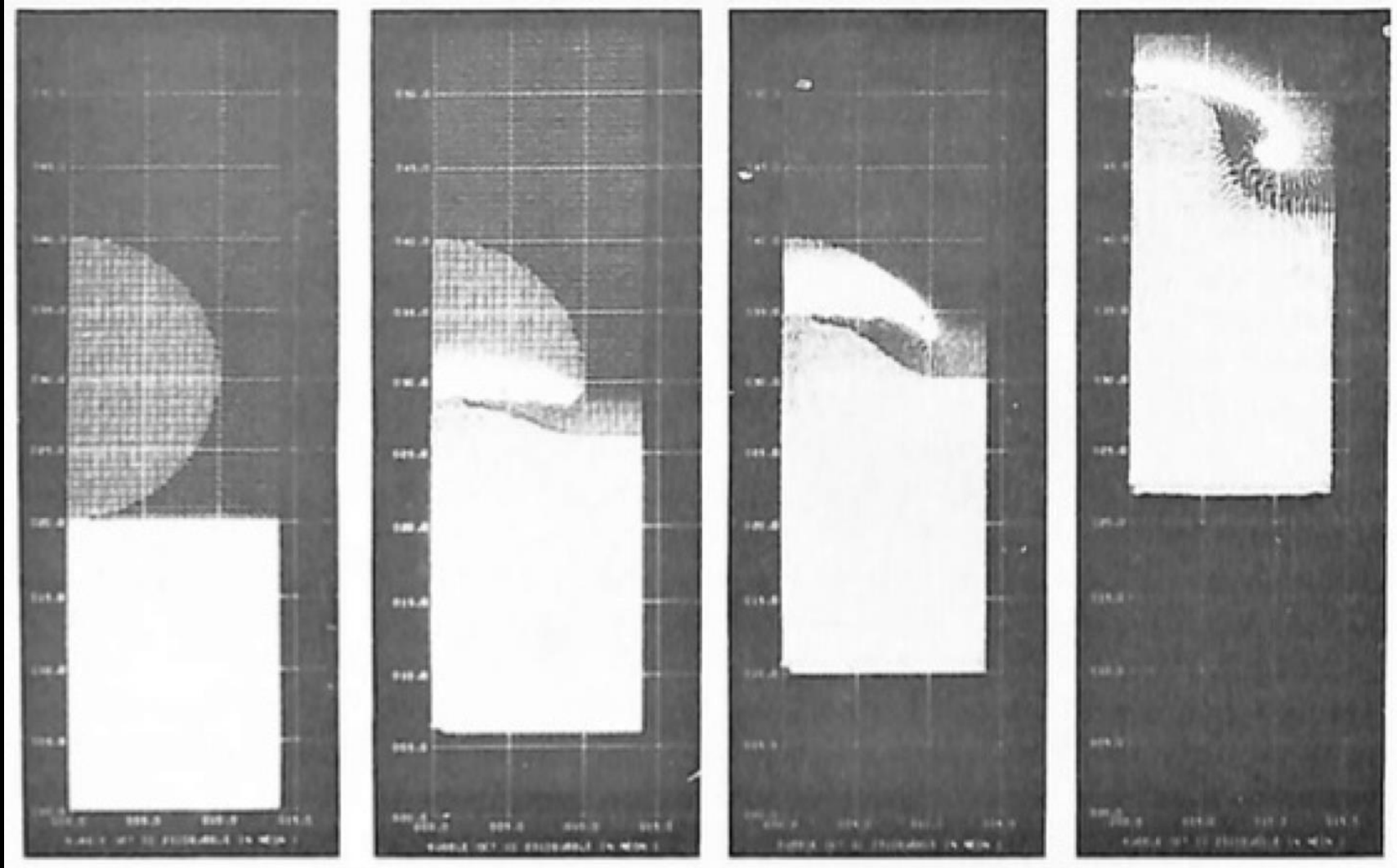


Yuri Gagarin,
Orbited the Earth on April 12, 1961.

IBM STRETCH

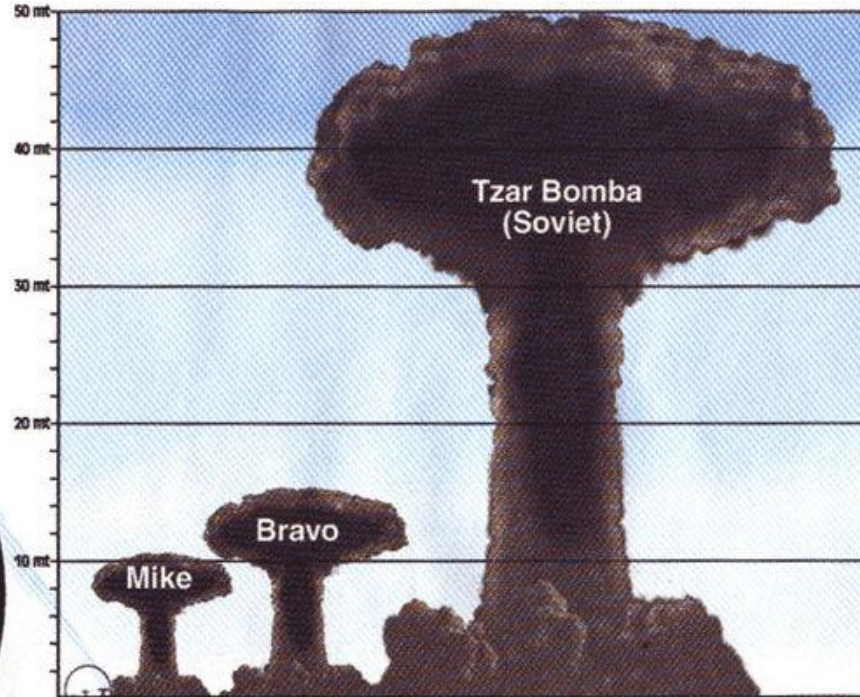
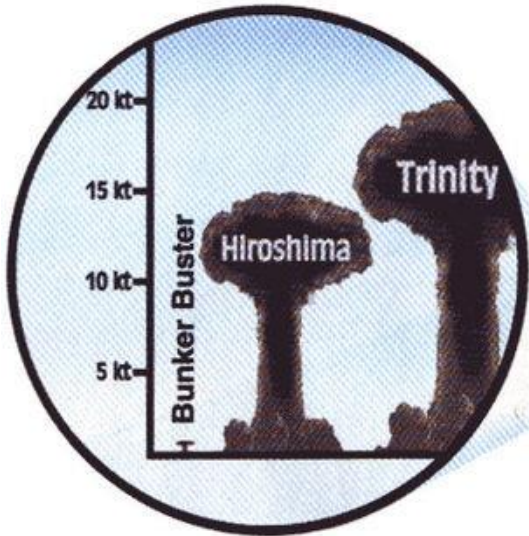
ATOMIC ENERGY COMMISSION
LOS ALAMOS SCIENTIFIC LABORATORY





Simulation from the Stretch supercomputer. Depicts the interaction of a helium bubble (the circle) with neon gas (square) from 0, 6, 10, and 22 millionths of a second.

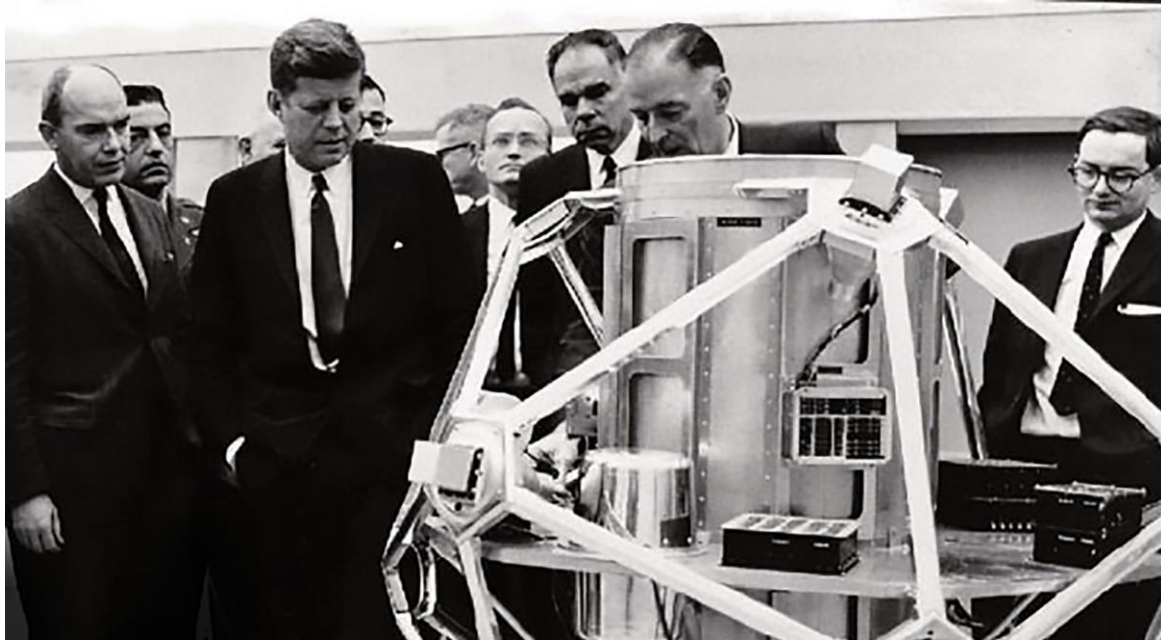
The Escalating Cold War



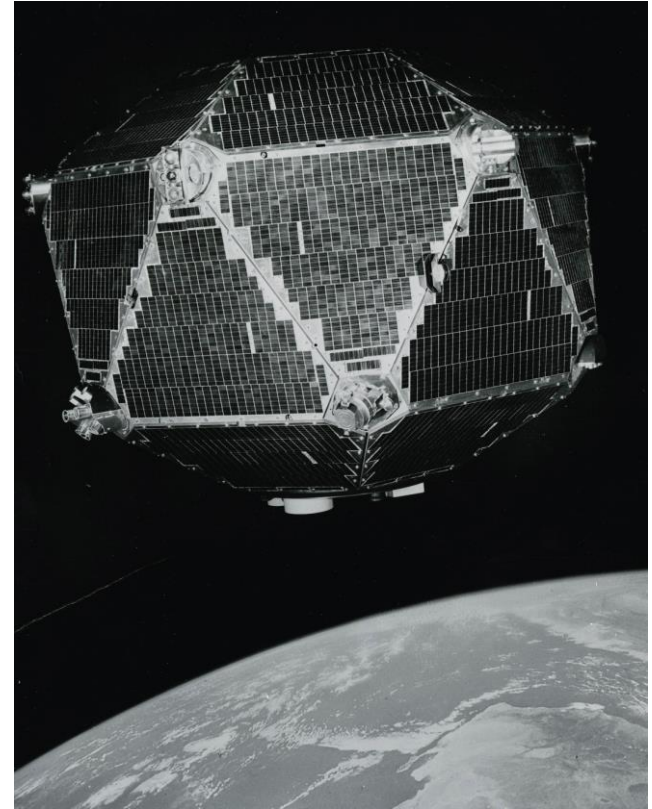
Tsar Bomba,
October 30, 1961.

Illustration From October 2002
Issue of "Popular Mechanics" (pg. 69)

Vela and the Partial Test Ban Treaty



President Kennedy inspects a Vela satellite mockup, 1962.



Artist depiction of a Vela satellite in orbit.



Testing Moves Underground



October 7, 1963,
President Kennedy signs
the Partial Test-Ban Treaty.

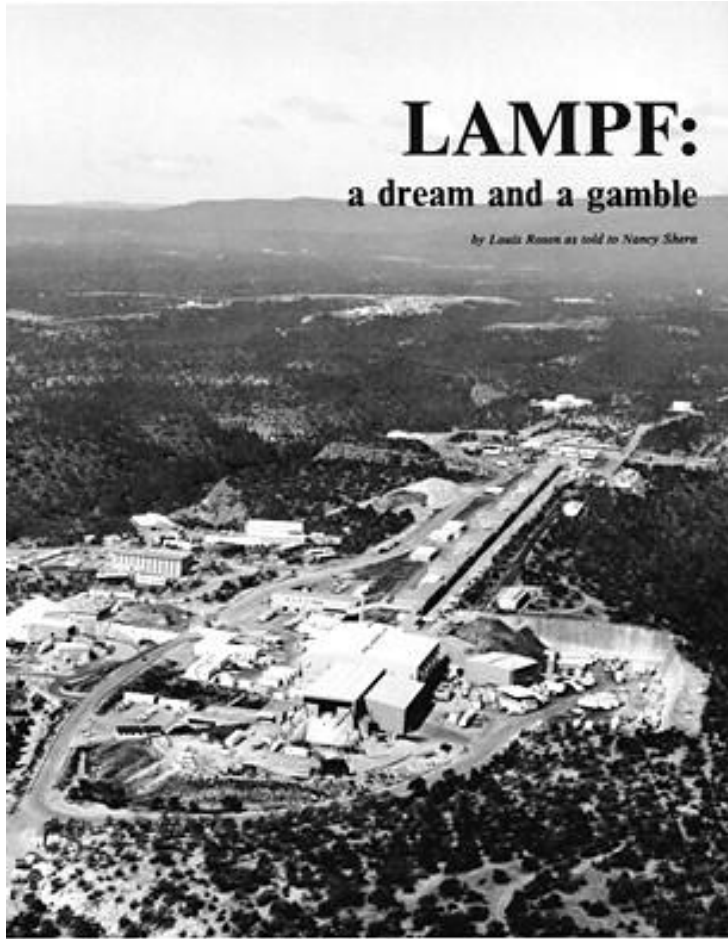
The Agnew Era

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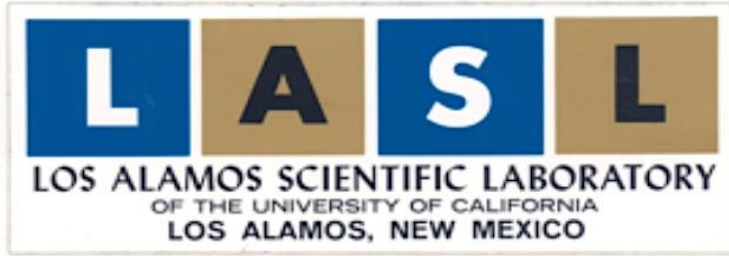
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Norris Bradbury
and Harold Agnew
(Dir. 1970-1979).



Los Alamos Meson Physics Facility (LAMPF) opened in 1972.

The 1970s



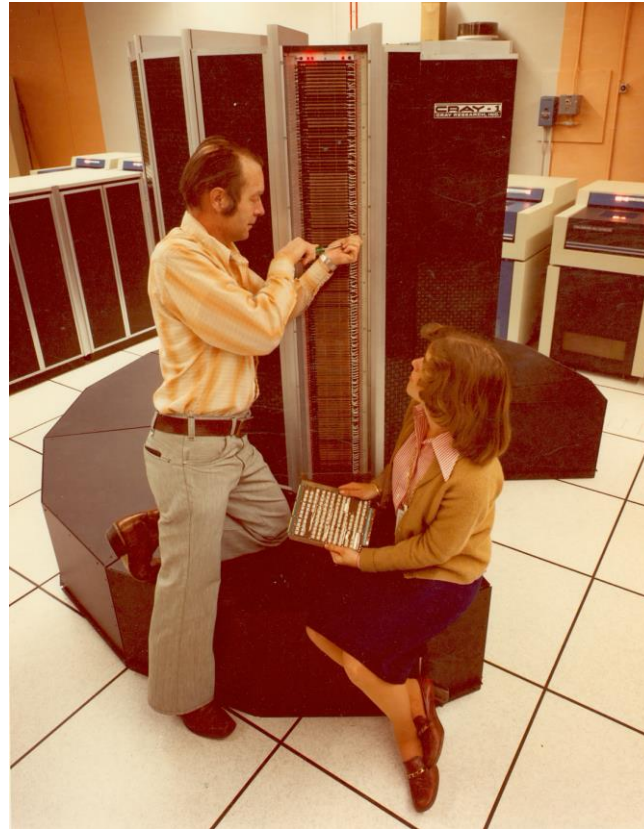
ERDA and the NRC replaced the AEC in 1974.

The 1970s

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Research Library built with slanted roof for solar panels, as was the Otowi Building.

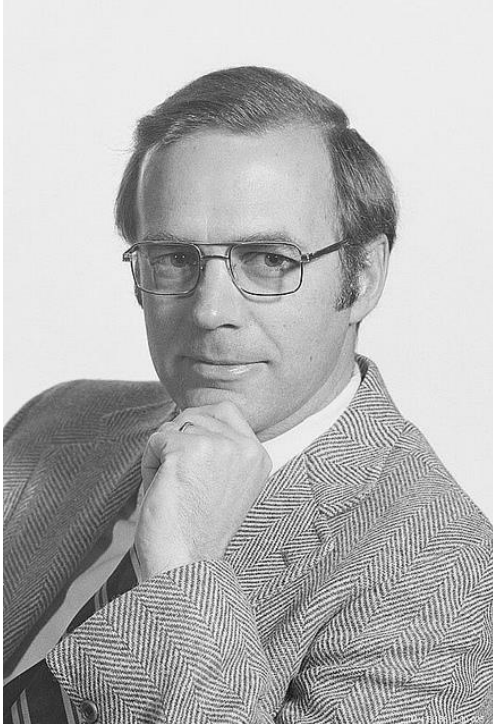


Los Alamos evaluated the first Cray-1 supercomputer, 1976.



Department of Energy, formed 1977.

Donald Kerr and the early 1980s



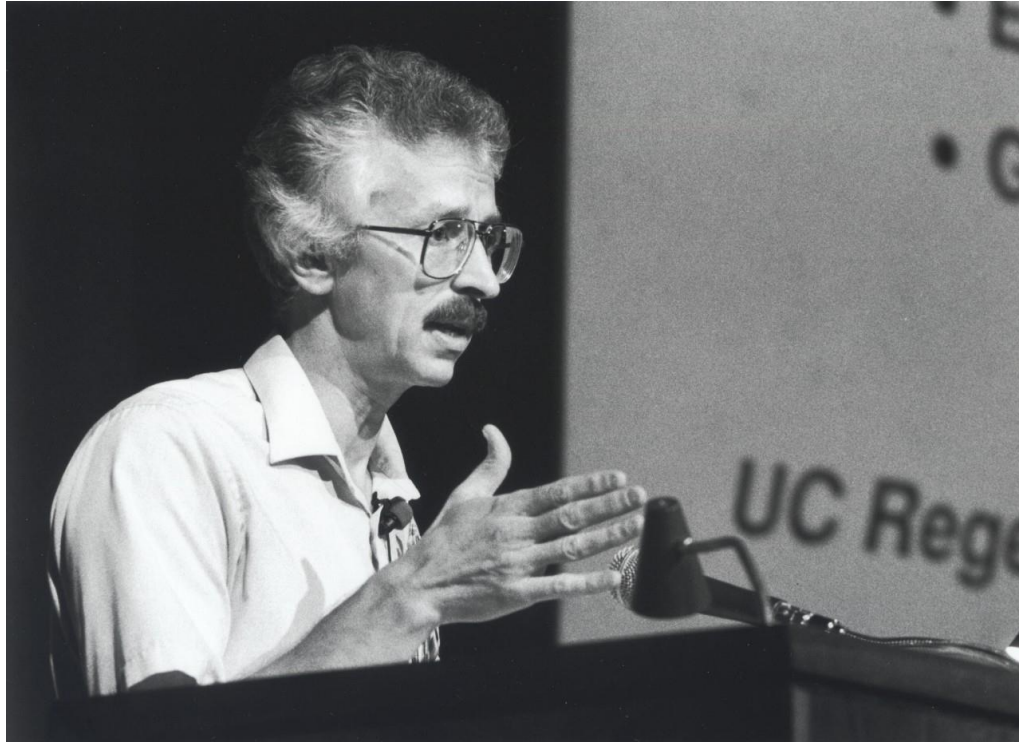
Donald Kerr
(Dir. 1979 – 1985).

Los Alamos
Los Alamos National Laboratory
Los Alamos, New Mexico 87545



Antares CO₂ Laser

Siegfried Hecker and the Last Years of the Cold War



Siegfried (Sig) Hecker
(Dir. 1985-1997).



End of the Cold War



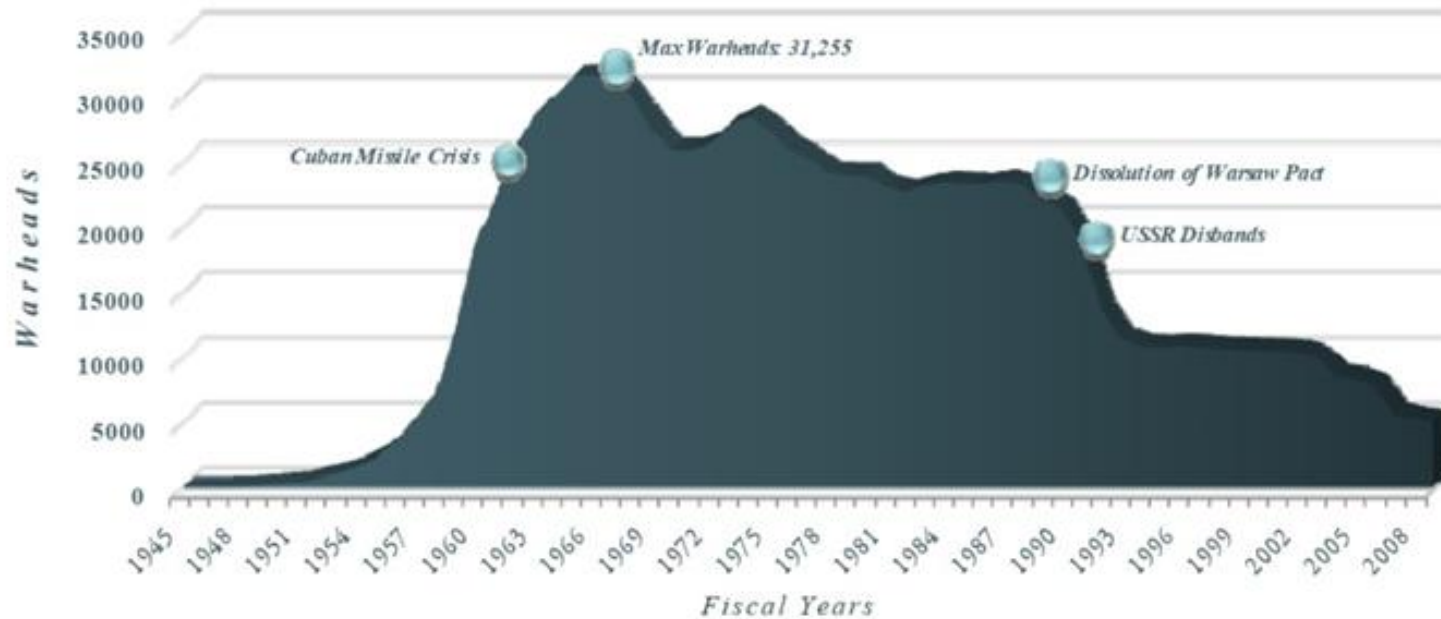
Boris Yeltsin opposes a Politburo hardliner coup, precipitating the collapse of the Soviet Union, 1991.

Sig Hecker and the Last Years of the Cold War



A-1

*U.S. Nuclear Weapons Stockpile, 1945-2009**



**Includes active and inactive warheads. Several thousand additional nuclear warheads are retired and awaiting dismantlement.*



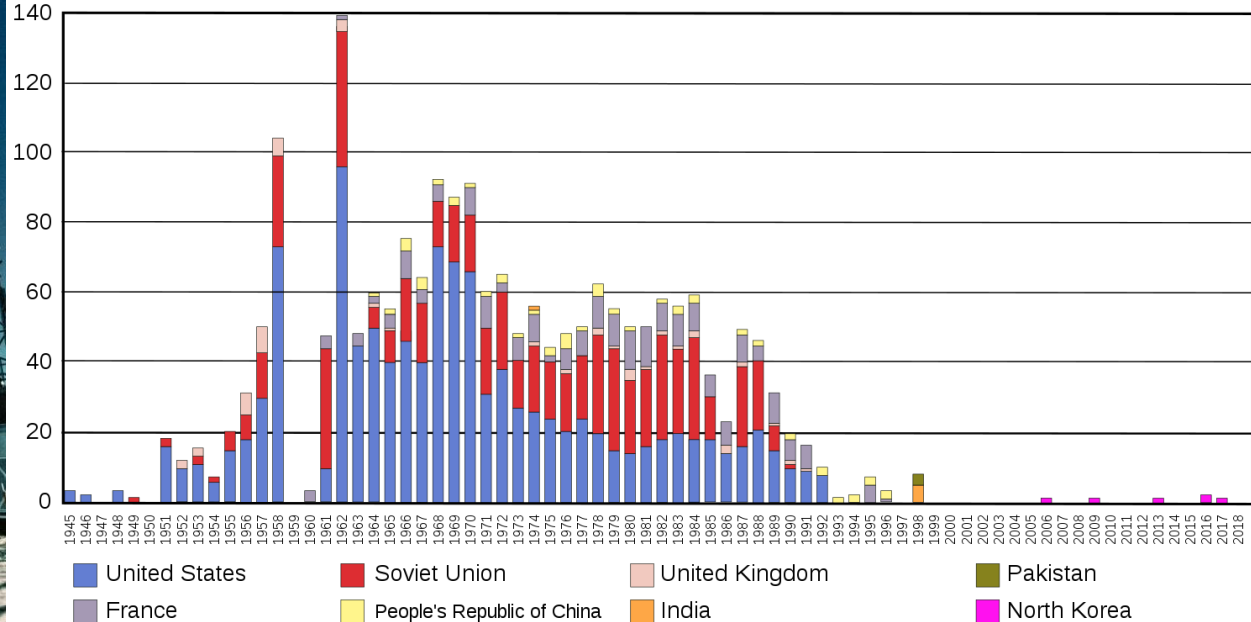
**Sig Hecker greets
Yulii B. Khariton**

End of Full-Scale Testing



Most recent US nuclear test,
Sept. 23, 1992.

Worldwide nuclear testing, 1945 - 2018





- 1992:** The most recent US nuclear test conducted.
- 1994:** Science-Based Stockpile Stewardship Program began.
- 1995:** The Accelerated Strategic Computing Initiative (ASCI) created.



ASCI Blue Mountain (1998-2004), LANL's first large-scale cluster computer.
3 teraflops performance equaled **19-thousand** Cray-1 systems.

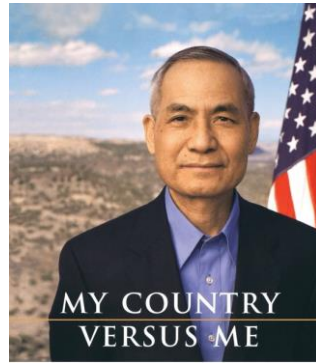
Nicholas C. Metropolis Center
For Modeling & Simulation

This is an aerial photograph of a modern, multi-story building. The building features a mix of light-colored panels and large glass windows. A prominent sign is mounted on a horizontal structure extending from the building. The foreground shows a paved courtyard with a young tree and some landscaping. In the background, there are mountains under a clear blue sky.

Troubles and Reinvention



John Browne
(Dir. 1997-2003).



The First-Hand Account by the Los Alamos
Scientist Who Was Falsely Accused of Being a Spy
WEN HO LEE
WITH HELEN ZIA



CIC-9: d100-144-001

Cerro Grande Fire, May 2000.

End of the UC Contract



Michael Anastasio (Dir. 2006-2011) meets with Bob Kuckuck (Dir. 2005-2006) and Linton Brooks, as the University of California contract ends and the Los Alamos National Security contract begins.



National Security Sciences Building (NSSB), completed February 2006.

The LANS Era



Charles McMillan (Dir. 2011-2017)



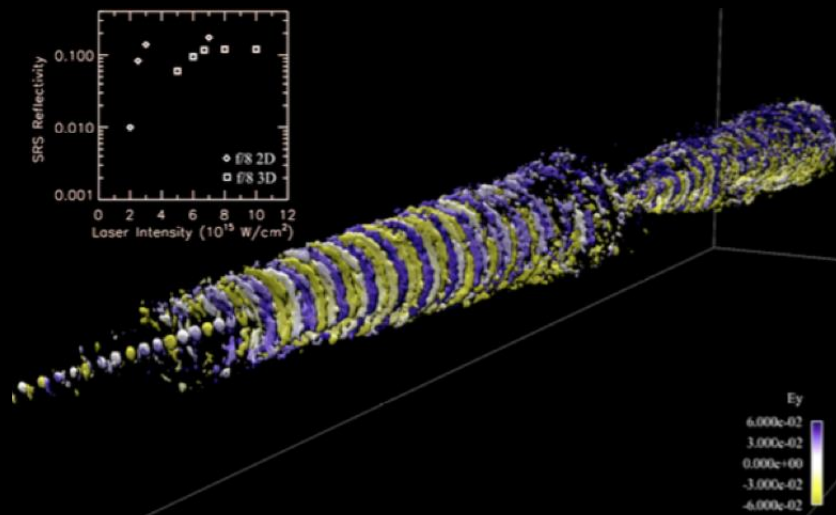
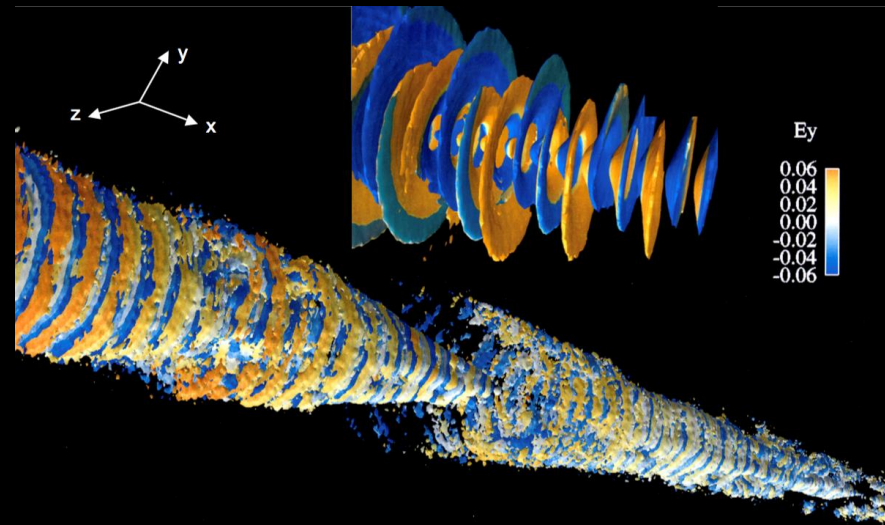
Terry Wallace, Jr. (Dir. 2018)



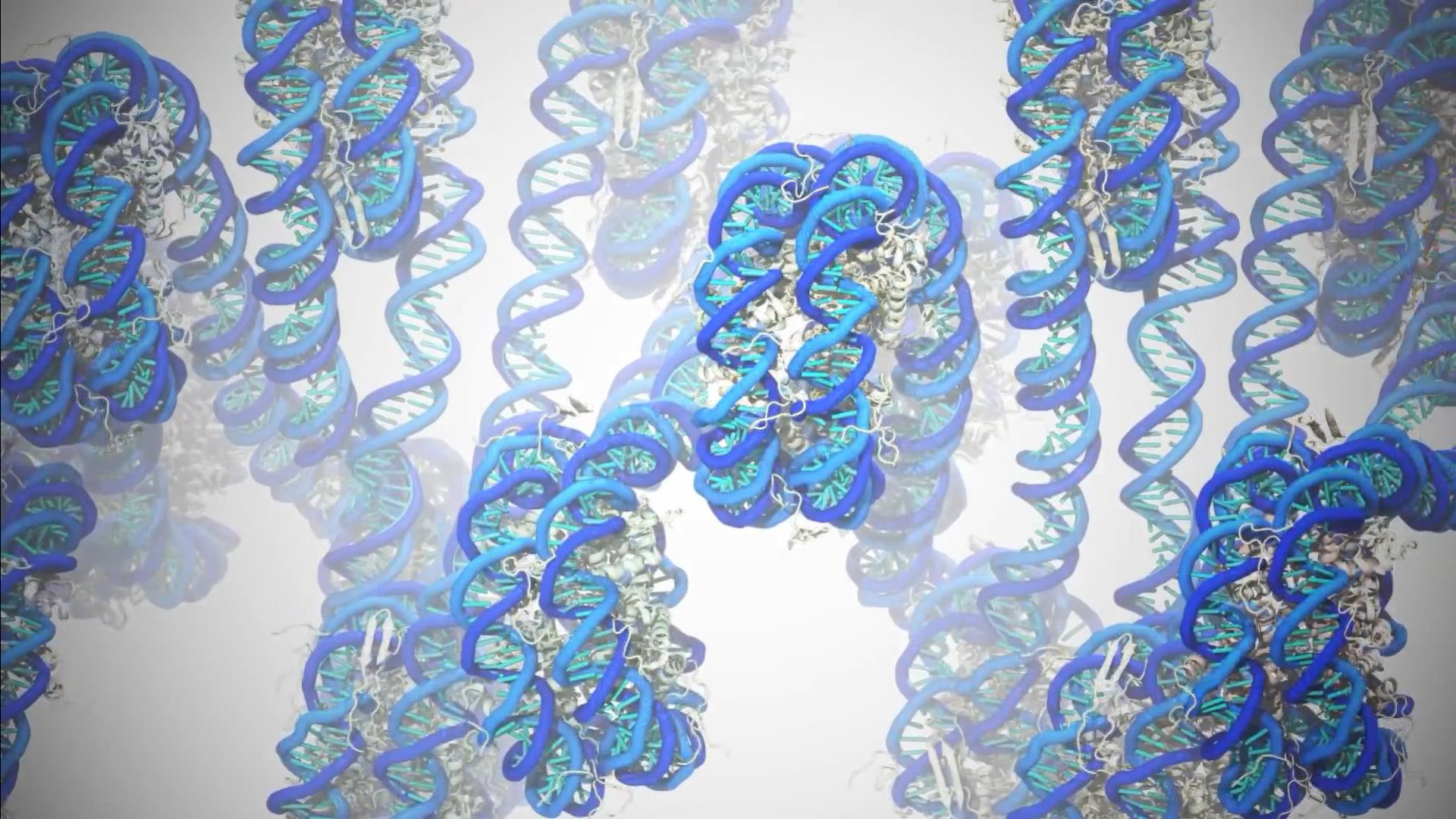
Demolition of Administration Building, October 2011.



Las Conchas fire, June-August 2011.

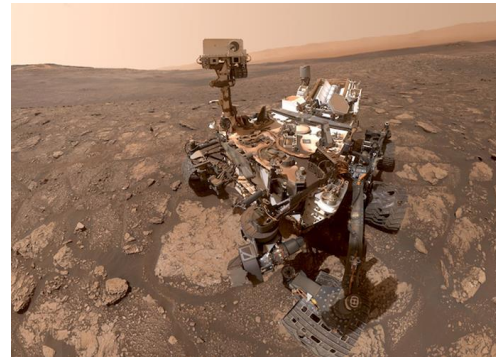
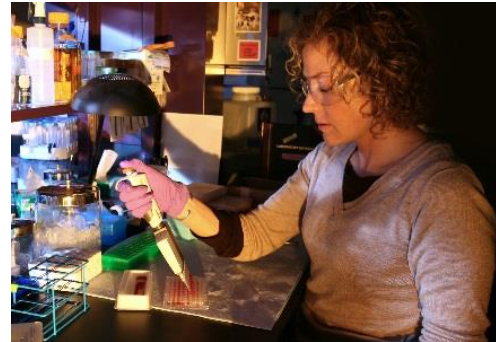


Roadrunner open-science simulations of laser-light scattering.





Thomas Mason (Dir. 2018-Present)





Our Heritage of Innovation

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- 1945: Los Alamos scientists conduct the world's first nuclear test
- 1945: Nuclear weapons developed at Los Alamos help end World War II
- 1946: The Monte Carlo method devised by LASL scientists
- 1946: LASL completes the world's first plutonium-fueled reactor
- 1951: First underground nuclear test conducted by LASL (according to DOE)
- 1951: LASL conducts the first nuclear test producing thermonuclear burn
- 1952: LASL conducts the first full-scale thermonuclear test
- 1953: LASL conducts the first tactical nuclear weapons test
- 1953: LASL scientists invent S_n method of deterministic modeling
- 1954: The largest United States nuclear test conducted by LASL
- 1956: The existence of the neutrino proven by LASL scientists (Nobel Prize)
- 1963: The heat pipe is invented by LASL scientists
- 1963: LASL-developed Vela satellites launched
- 1967: Gamma-ray bursts first detected by Vela satellites
- 1972: LAMPF produces an 800 MEV beam
- 1973: LASL's Nuclear Safeguards Program begins
- 1974: LAMPF ships its first medical radioisotopes
- 1976: LANL Cray-1 named world's fastest computer

- 1979: IHE first used in a stockpiled nuclear weapon
- 1982: GenBANK established at LANL
- 1984: LANL x-ray detectors used on GPS satellites
- 1988: Center for Genome Studies established at LANL
- 1988: LANL participates in Joint Verification Experiment
- 1990: National High Magnetic Field Laboratory established at LANL
- 1990: LANL begins participation in experiments that ultimately confirm neutrino mass
- 1992: LANL conducts the last US nuclear weapons test
- 1993: LANL CM-5 is first #1 supercomputer on the Top500 list
- 1995: Chromosome 16 is mapped at LANL
- 2002: The first 3D full-system weapons simulation is performed at LANL
- 2008: LANL's Roadrunner supercomputer breaks the petaflop barrier
- 2009: DARHT becomes the world's most powerful x-ray machine
- 2012: LANL scientists produce a 100T non-destructive magnetic field
- 2012: Curiosity Rover lands on Mars equipped with LANL instruments
- 2015: LANL scientists develop a breakthrough portable medical MRI device
- 2015: LANL-invented "Burst Buffer" SSD storage tier debuts on Trinity supercomputer
- 2019: LANL Scientists create first billion-atom biomolecular simulation

