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Title:	A Brief History of the Lab at Los Alamos
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A Brief History of the Lab at Los Alamos

This talk gives a general overview of the history of Los Alamos, from its establishment in WWII through today.

NATIONAL SECURITY RESEARCH CENTER

Los Alamos
NATIONAL LABORATORY

A Brief History of the Lab at Los Alamos

NATIONAL SECURITY
RESEARCH
CENTER

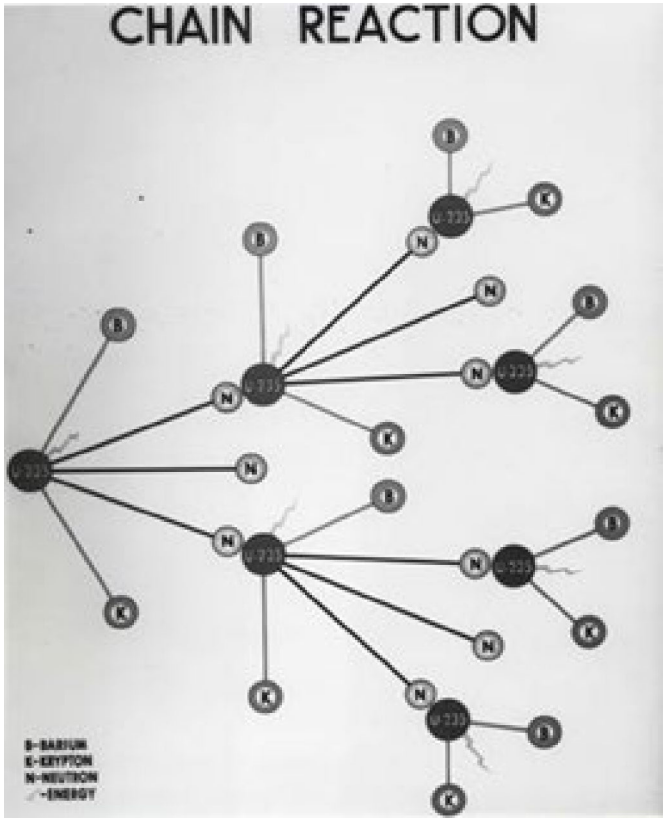
Madeline Whitacre

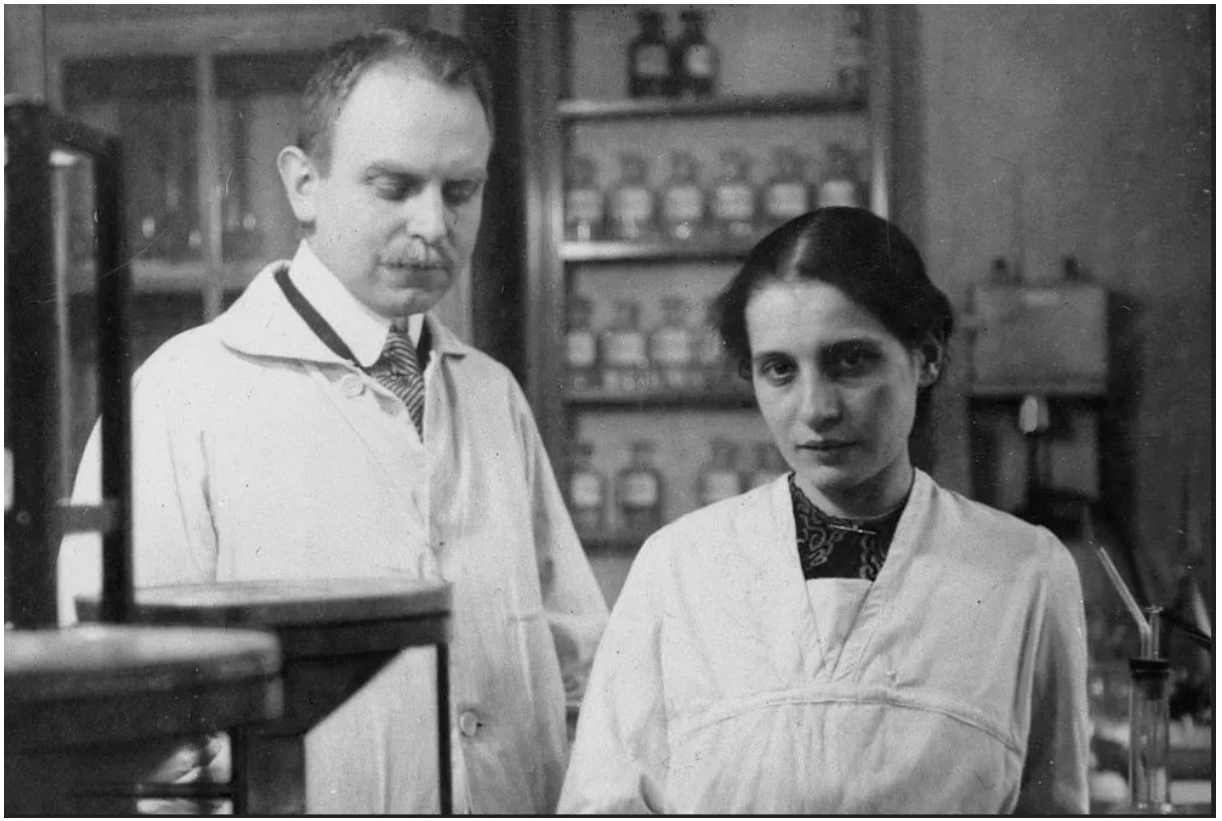
NSRC Historian

NNSA
National Nuclear Security Administration

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

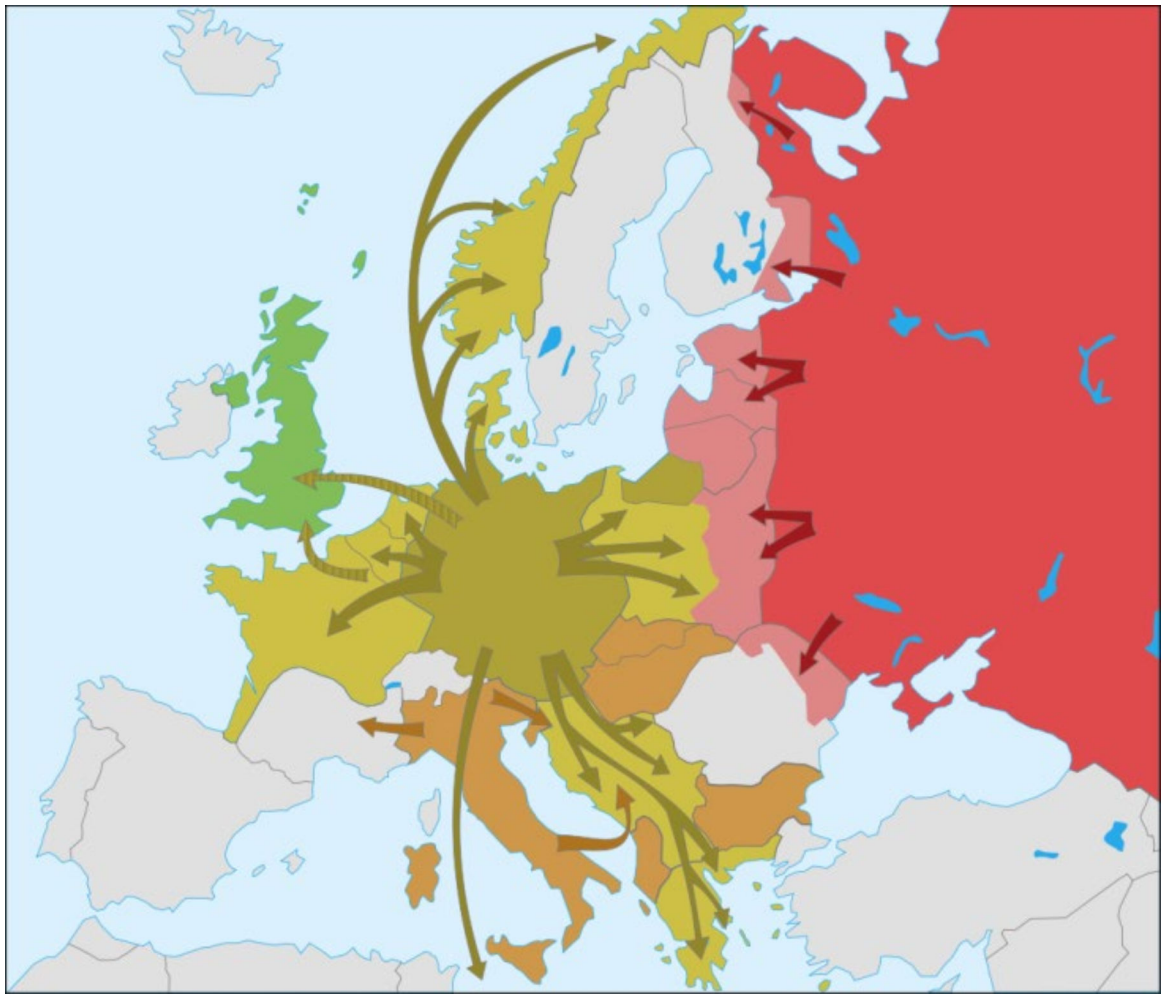
Fission is Discovered





The World at War

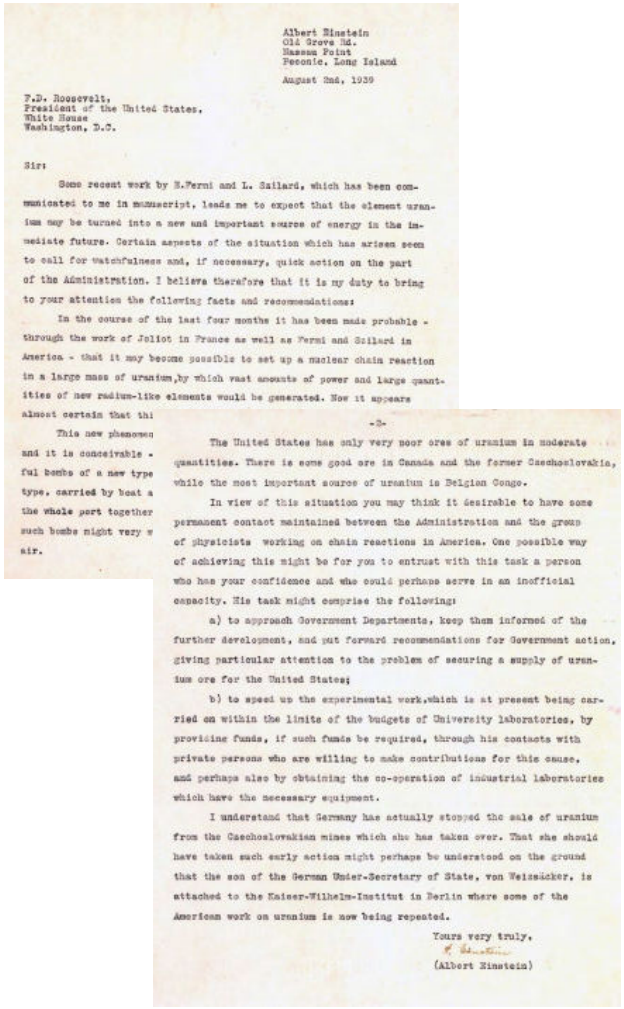
Hitler, Stalin, and Europe at War.



The World at War

The attack on Pearl Harbor.

Changing Priorities



Albert Einstein
Old Grove Rd.
Nassau Point
Peconic, Long Island

August 2nd, 1939

F.D. Roosevelt,
President of the United States,
White House
Washington, D.C.

Sir:

Some recent work by E.Fermi and L. Szilard, which has been communicated to me in manuscript, leads me to expect that the element uranium may be turned into a new and important source of energy in the immediate future. Certain aspects of the situation which has arisen seem to call for watchfulness and, if necessary, quick action on the part of the Administration. I believe therefore that it is my duty to bring to your attention the following facts and recommendations:

In the course of the last four months it has been made probable - through the work of Joliot in France as well as Fermi and Szilard in America - that it may become possible to set up a nuclear chain reaction in a large mass of uranium,by which vast amounts of power and large quantities of new radium-like elements would be generated. Now it appears almost certain that thi

This new phenomen

and it is conceivable -

ful bombs of a new type

type, carried by boat a

the whole port together

such bombs might very w

air.

-2-

The United States has only very poor ores of uranium in moderate quantities. There is some good ore in Canada and the former Czechoslovakia, while the most important source of uranium is Belgian Congo.

In view of this situation you may think it desirable to have some permanent contact maintained between the Administration and the group of physicists working on chain reactions in America. One possible way of achieving this might be for you to entrust with this task a person who has your confidence and who could perhaps serve in an inofficial capacity. His task might comprise the following:

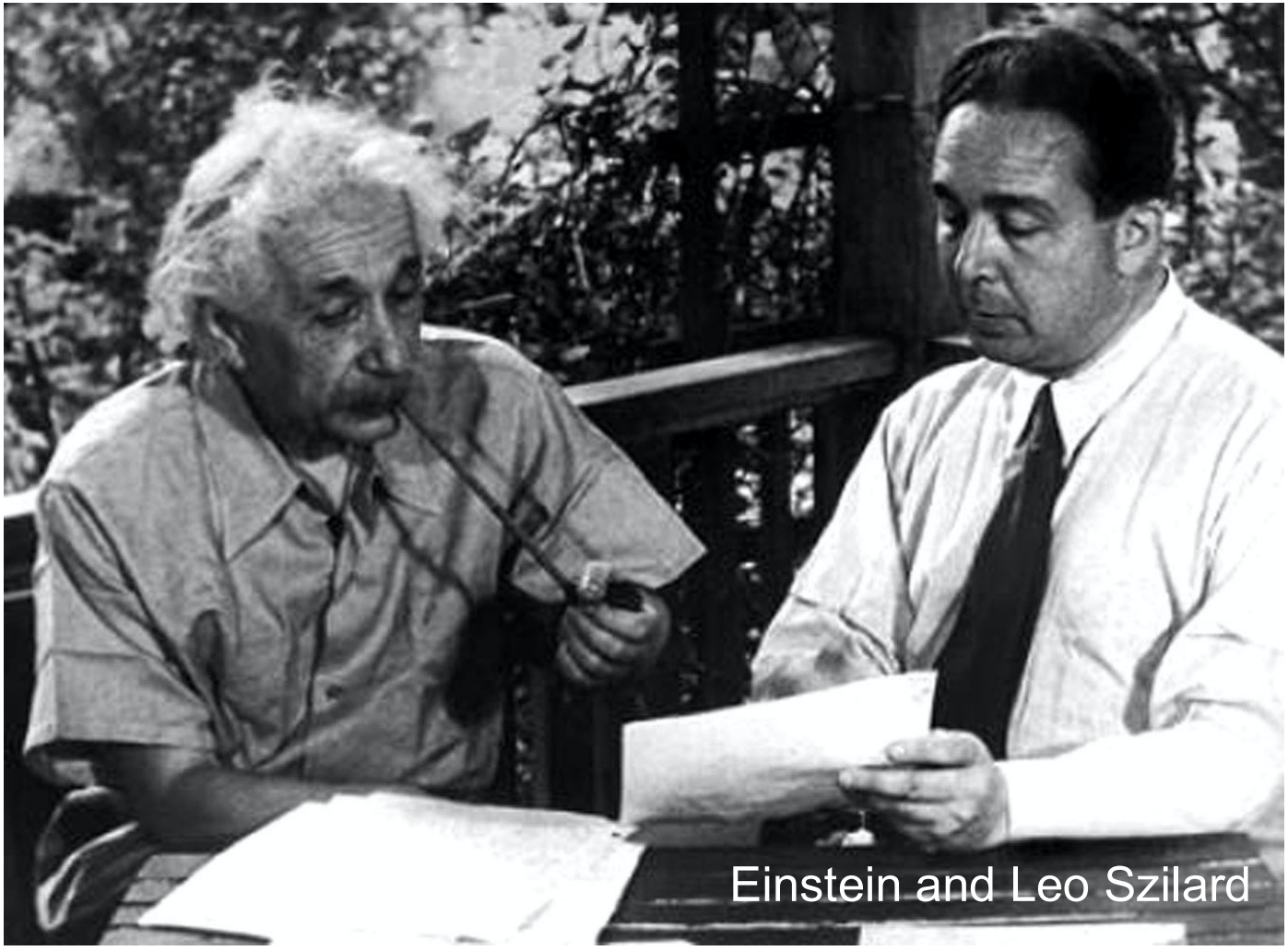
a) to approach Government Departments, keep them informed of the further development, and put forward recommendations for Government action, giving particular attention to the problem of securing a supply of uranium ore for the United States;

b) to speed up the experimental work,which is at present being carried on within the limits of the budgets of University laboratories, by providing funds, if such funds be required, through his contacts with private persons who are willing to make contributions for this cause, and perhaps also by obtaining the co-operation of industrial laboratories which have the necessary equipment.

I understand that Germany has actually stopped the sale of uranium from the Czechoslovakian mines which she has taken over. That she should have taken such early action might perhaps be understood on the ground that the son of the German Under-Secretary of State, von Weizsäcker, is attached to the Kaiser-Wilhelm-Institut in Berlin where some of the American work on uranium is now being repeated.

Yours very truly,

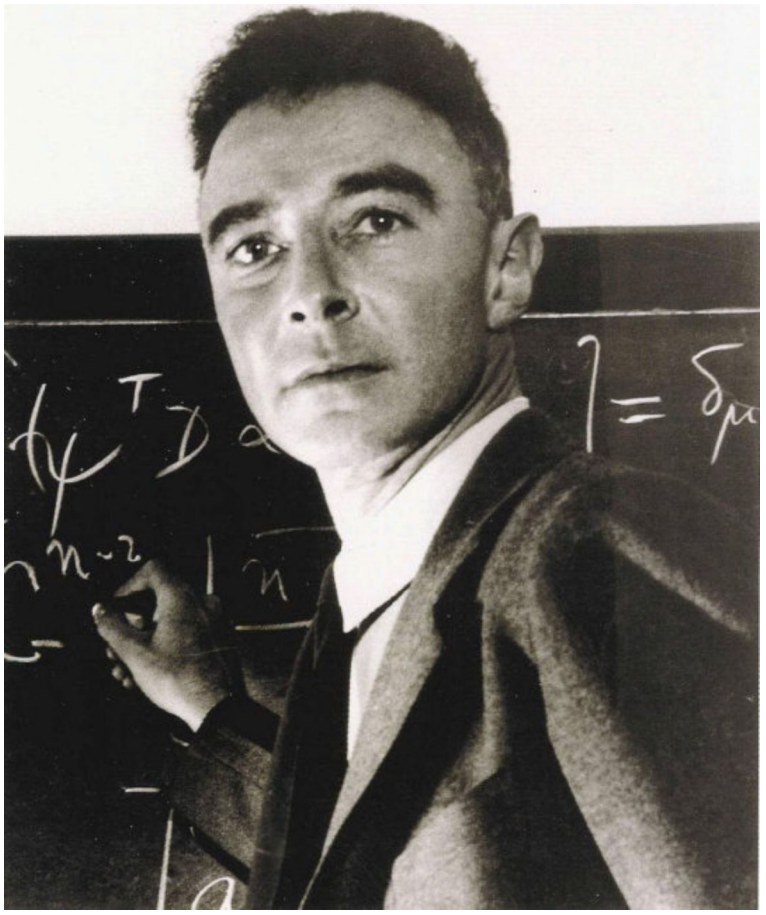
(Albert Einstein)



Einstein and Leo Szilard

Beginning of the Manhattan Project

Leslie Groves



J. Robert Oppenheimer

Beginning of the Manhattan Project

Wartime Los Alamos was known as Project Y

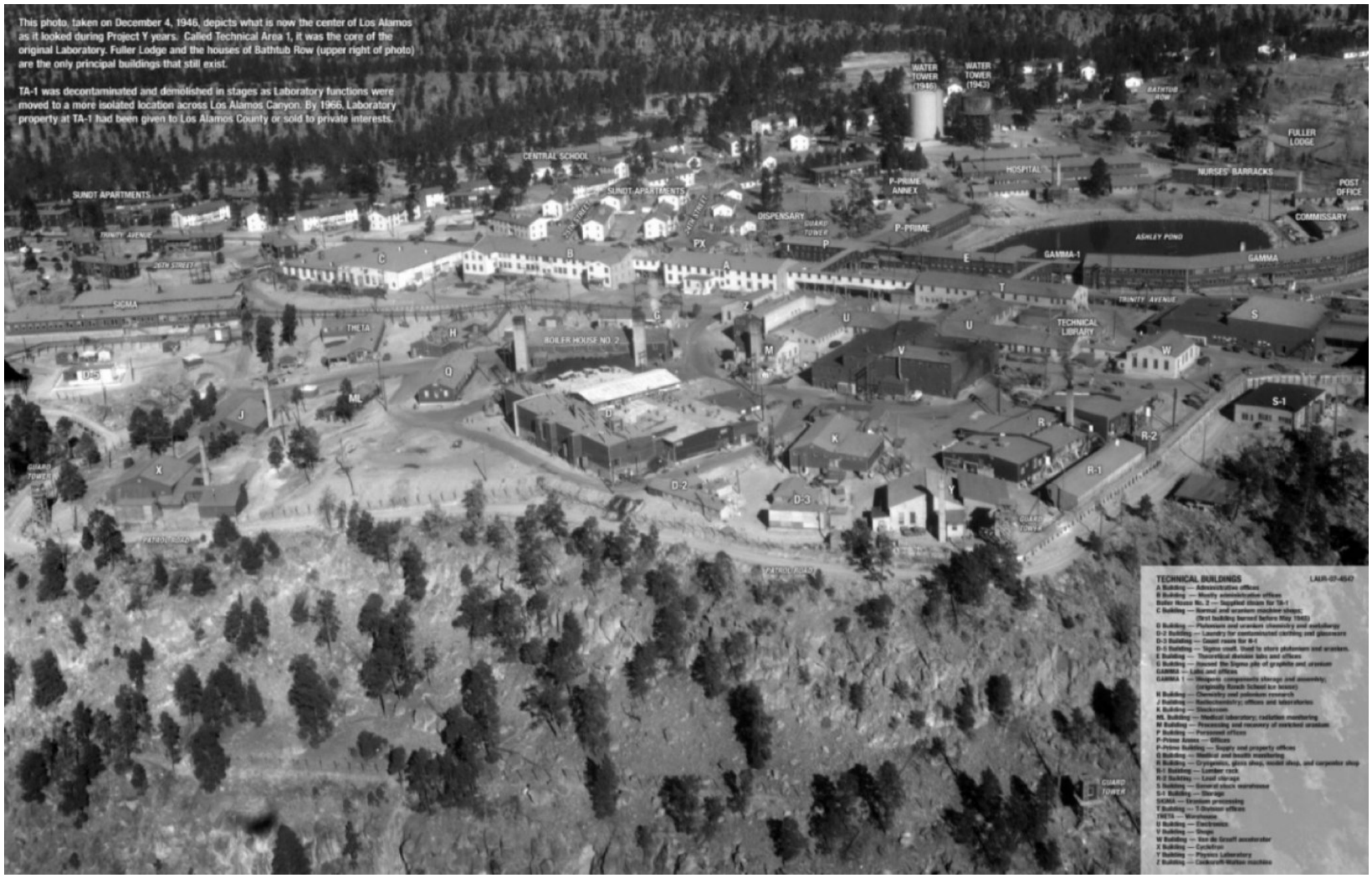
Major sites of the Manhattan Project

Los Alamos at War

Los Alamos at War

Ashley Pond before Project Y

Los Alamos at War



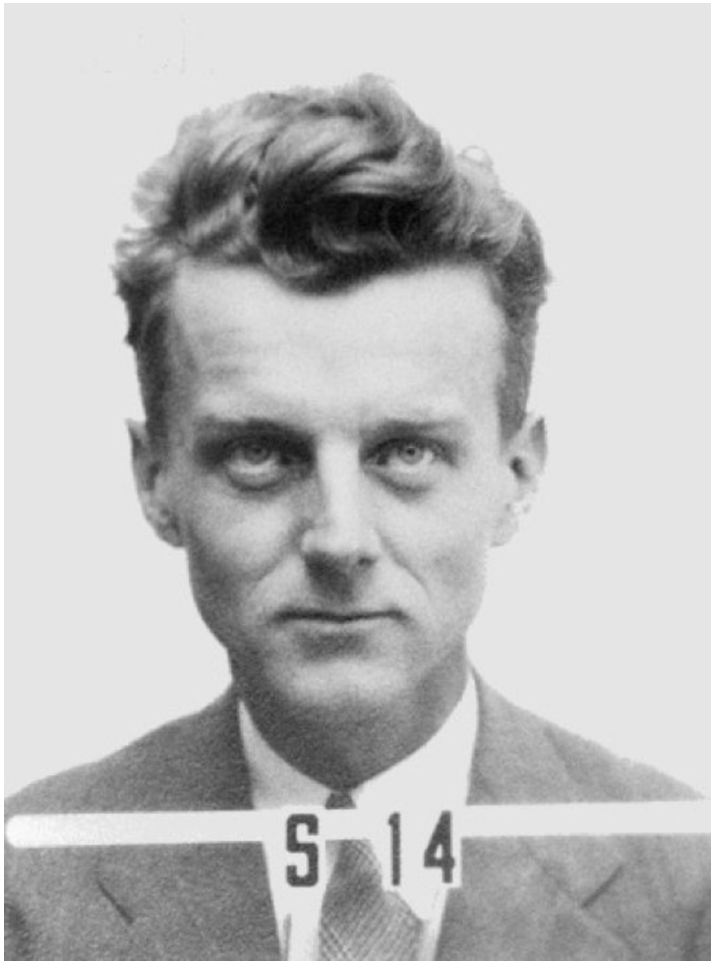
Los Alamos at War

The Main Wartime Technical Area.

Los Alamos at War

Living Conditions on the Mesa.

Los Alamos at War



Seth Neddermeyer

John von Neumann

Los Alamos at War

Josephine Elliott

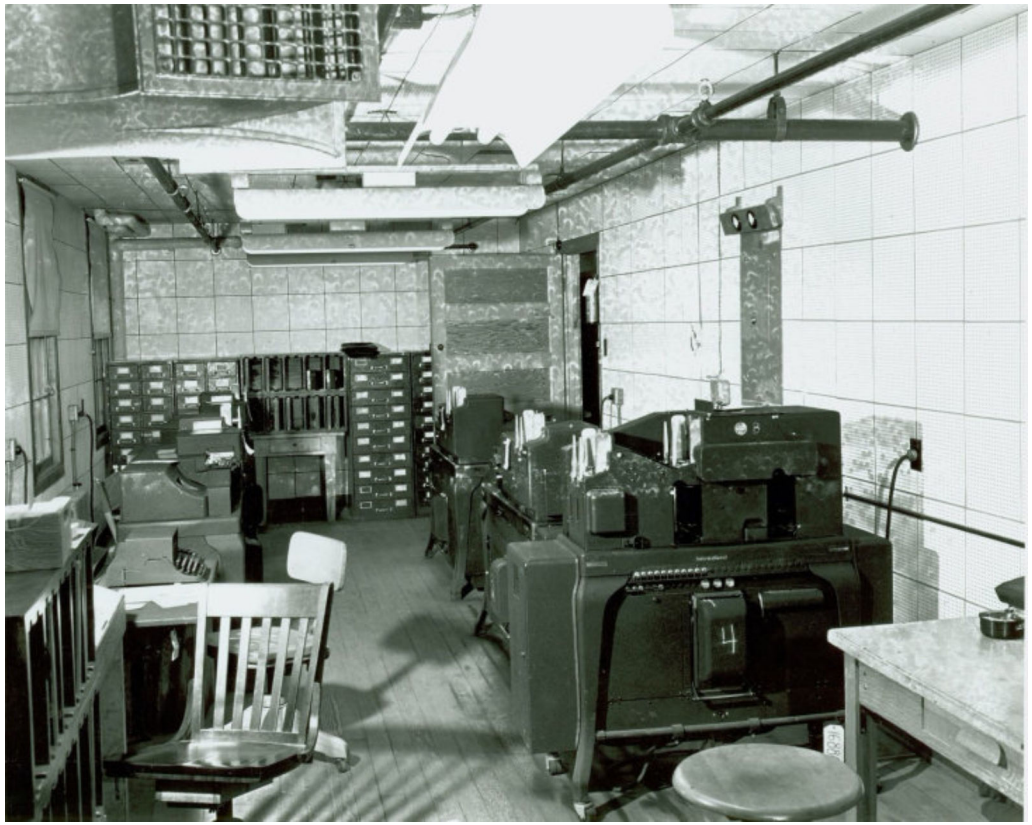
Augusta Teller

Kay Manley

Jean Bacher

Bernice Brode

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

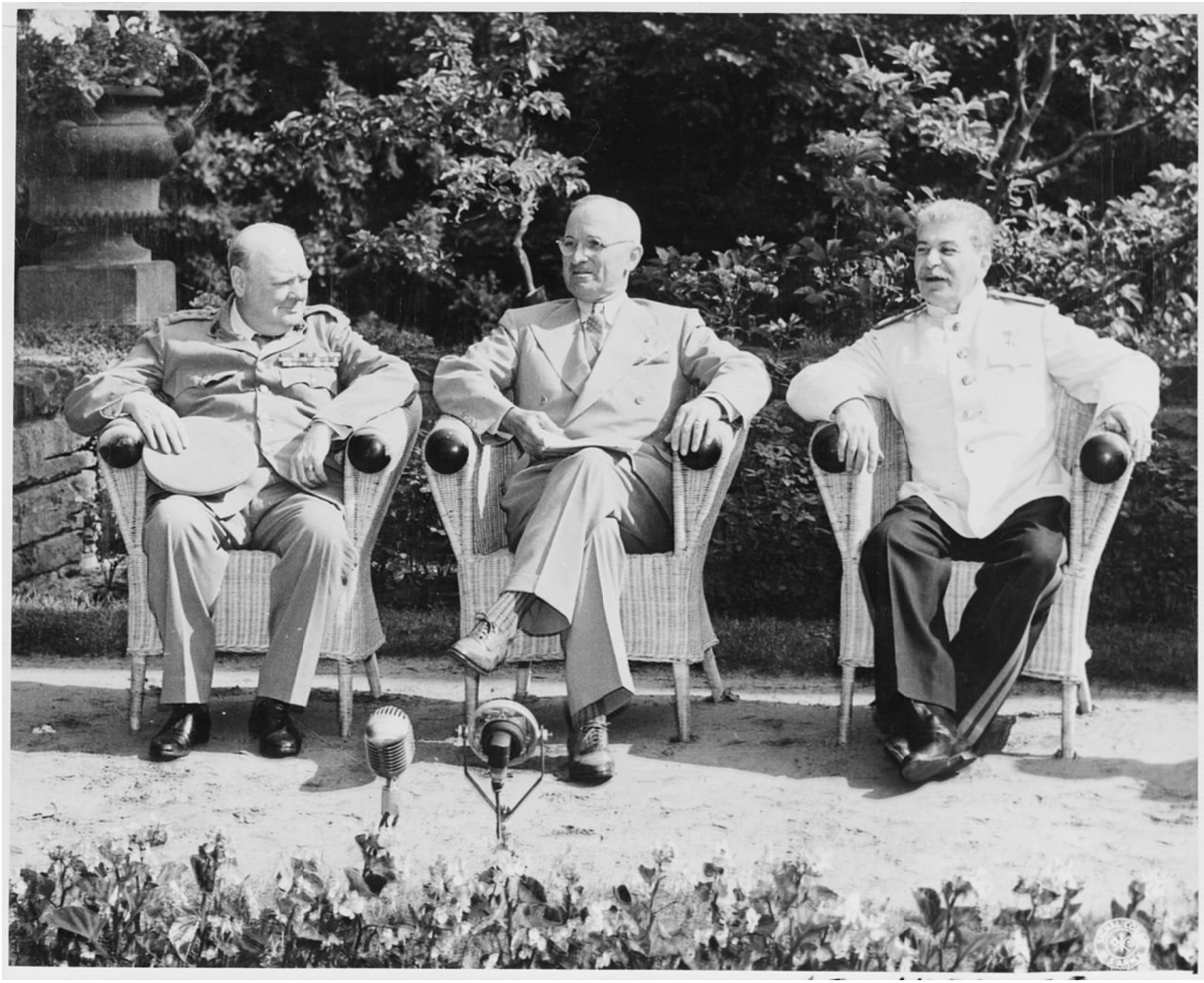


IBM punched-card accounting machines (PCAM) performed large volumes of implosion calculations.

Photo of Trinity Test by Jack Aeby

Los Alamos at War

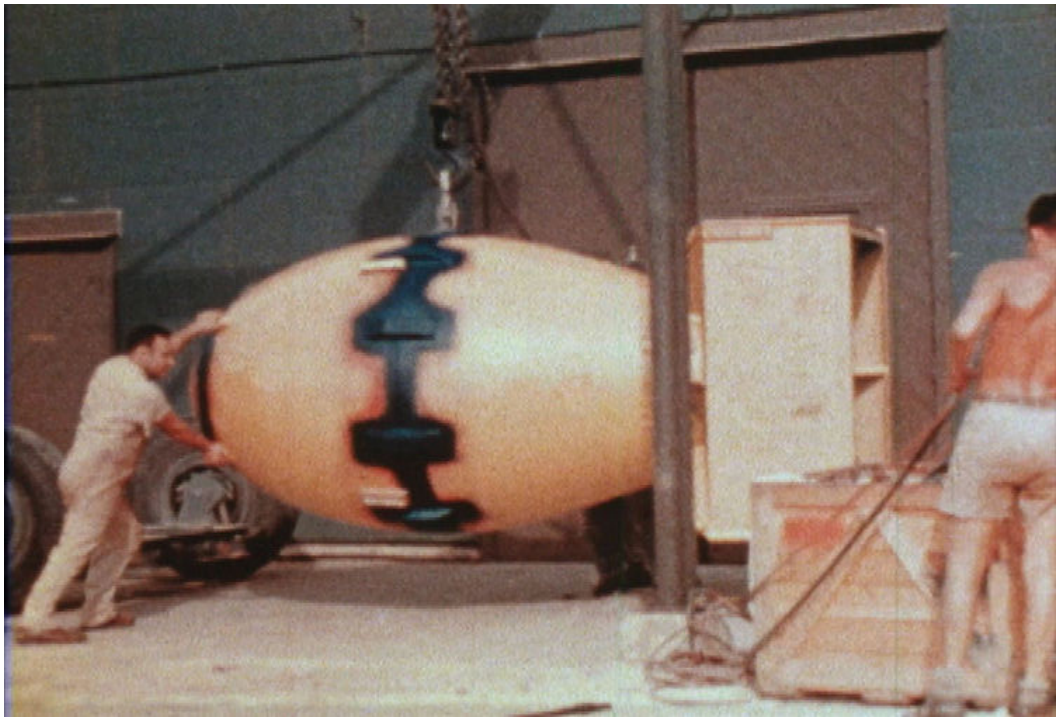
After Trinity

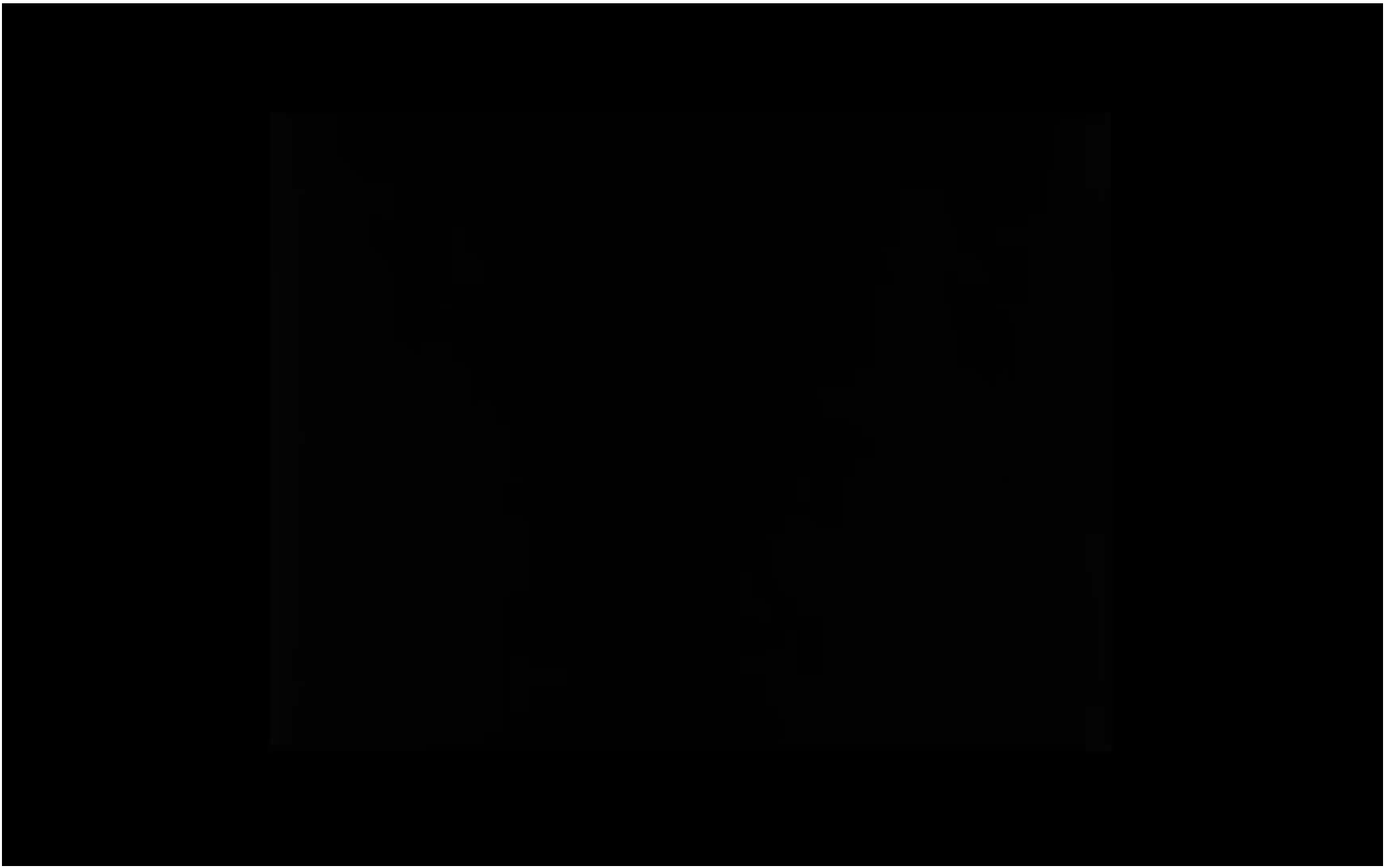


Churchill, Truman, and Stalin at Potsdam Conference.

Hiroshima and Nagasaki

Little Boy and Fat Man



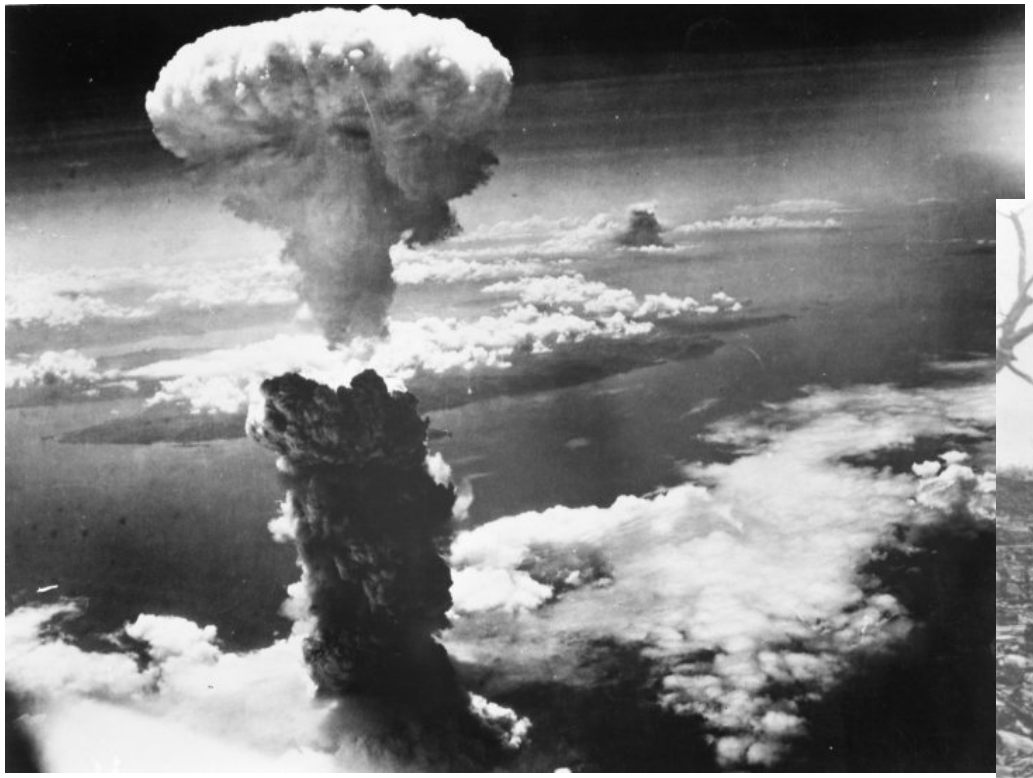


Hiroshima and Nagasaki

Aftermath in Hiroshima

Approximately 64,500 deaths by mid-November 1945

Hiroshima and Nagasaki

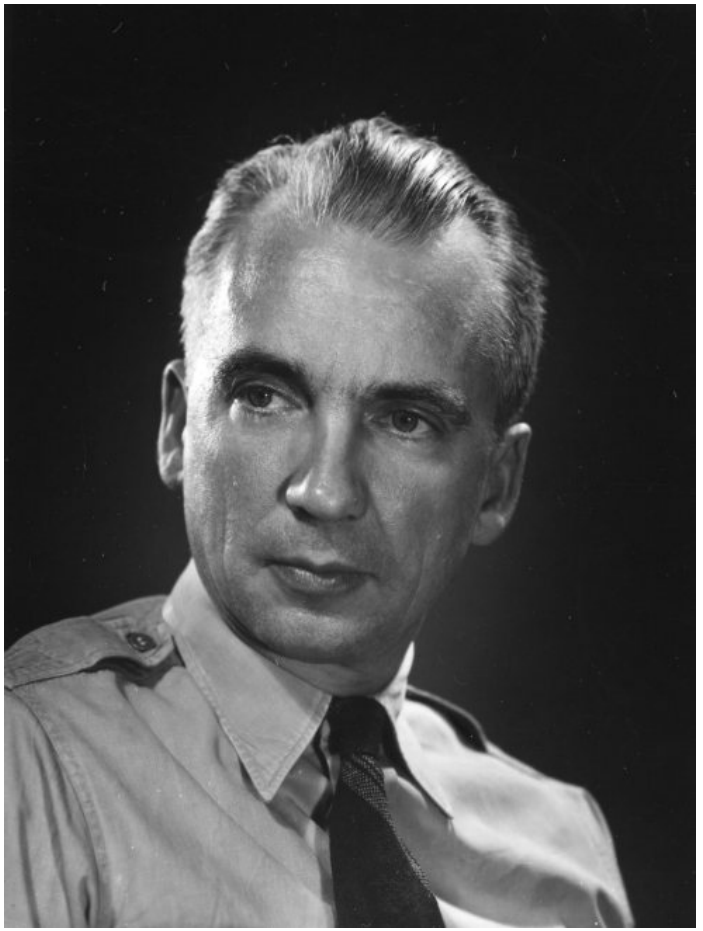


Fat Man over Nagasaki, and its aftermath

Approximately 39,200 deaths by mid-November 1945

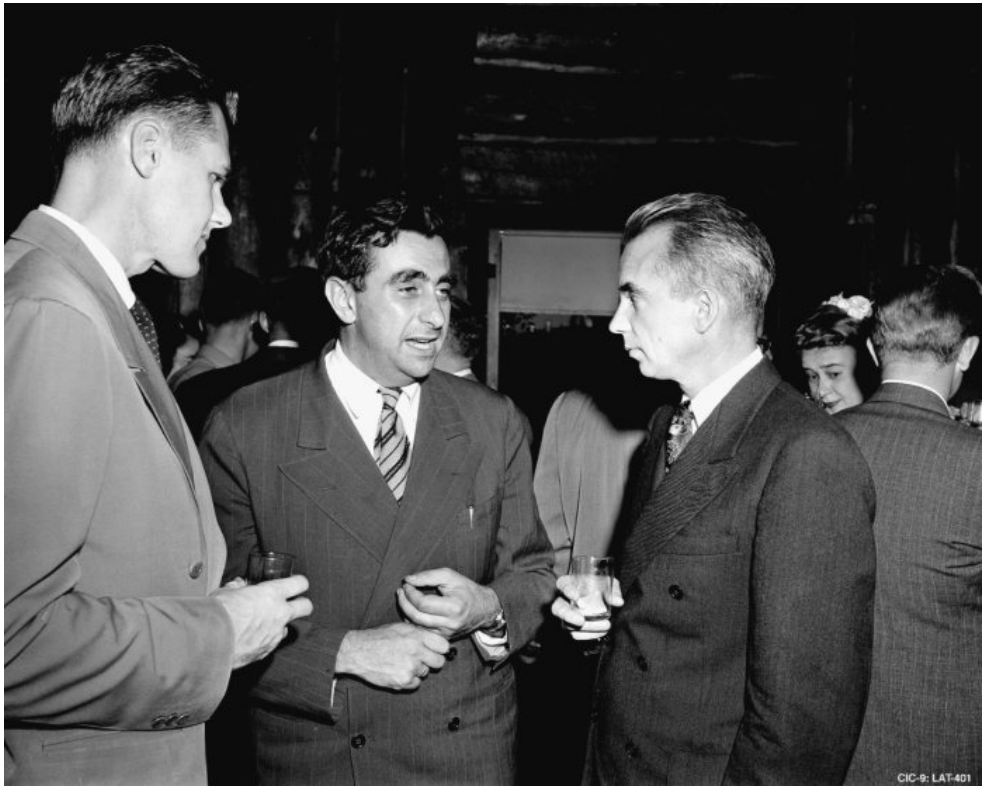
War's End and a New Beginning

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

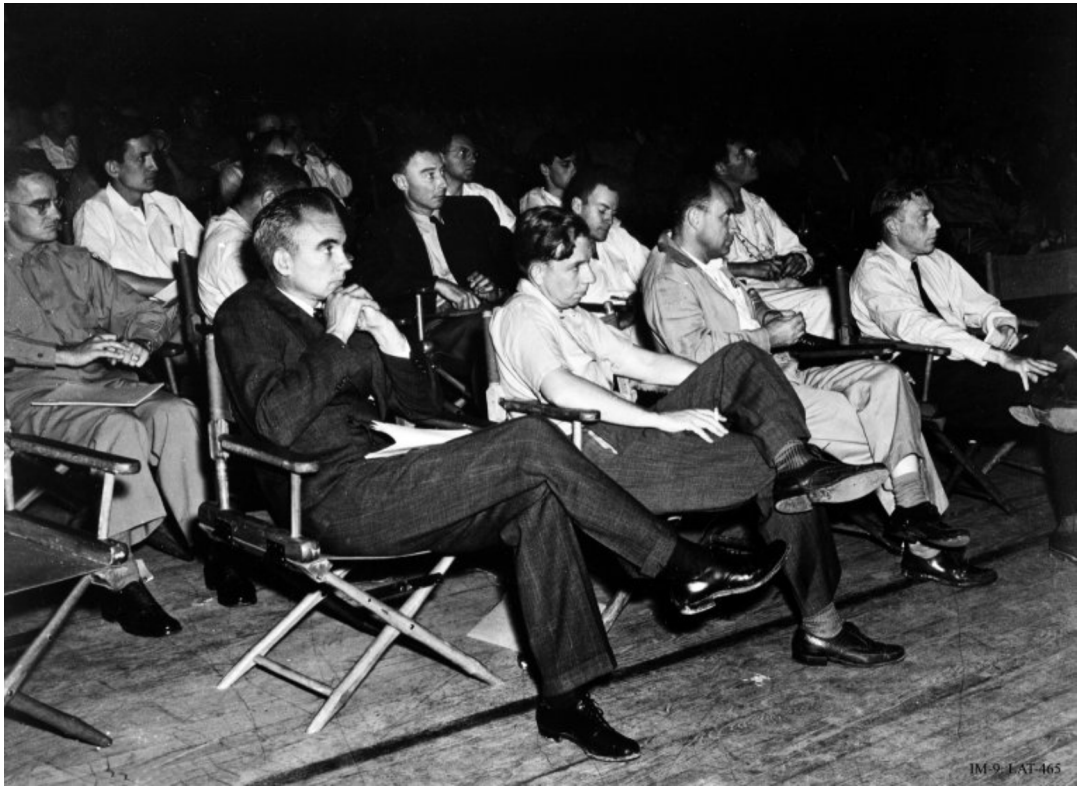


Norris Bradbury (Dir. 1945 – 1970)

Postwar Reinvention of Los Alamos

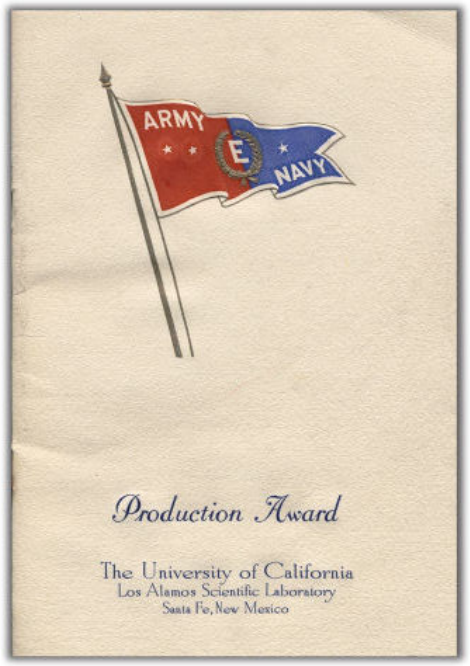


Edward Teller (center) and Norris Bradbury (right) at Fuller Lodge, 1946



Norris Bradbury (front left) and Robert Oppenheimer (center) 1946 Super conference

A New Era



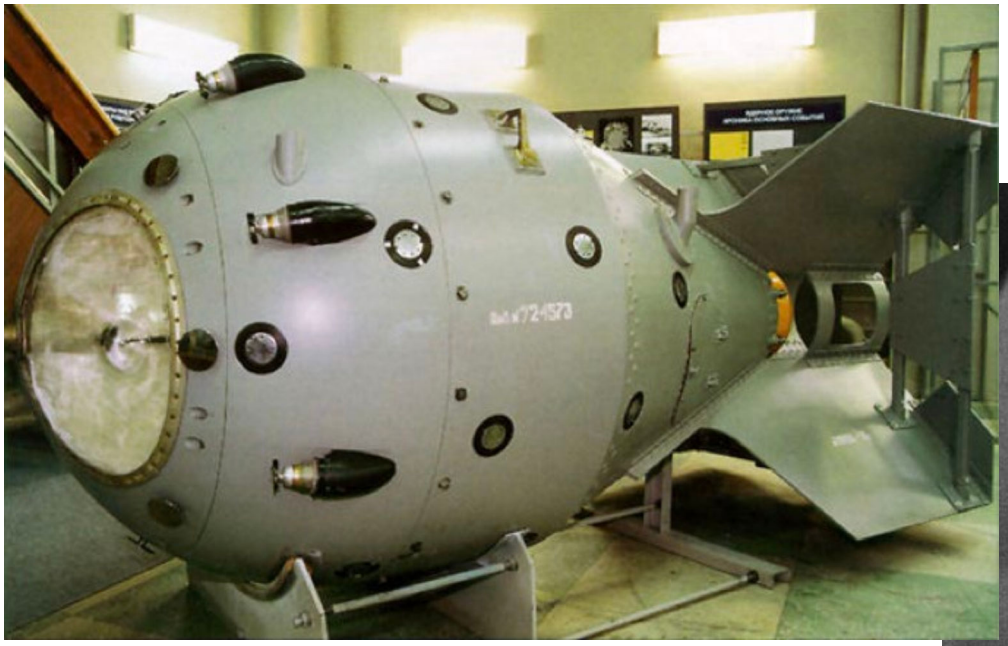
los alamos
scientific laboratory
of the University of California

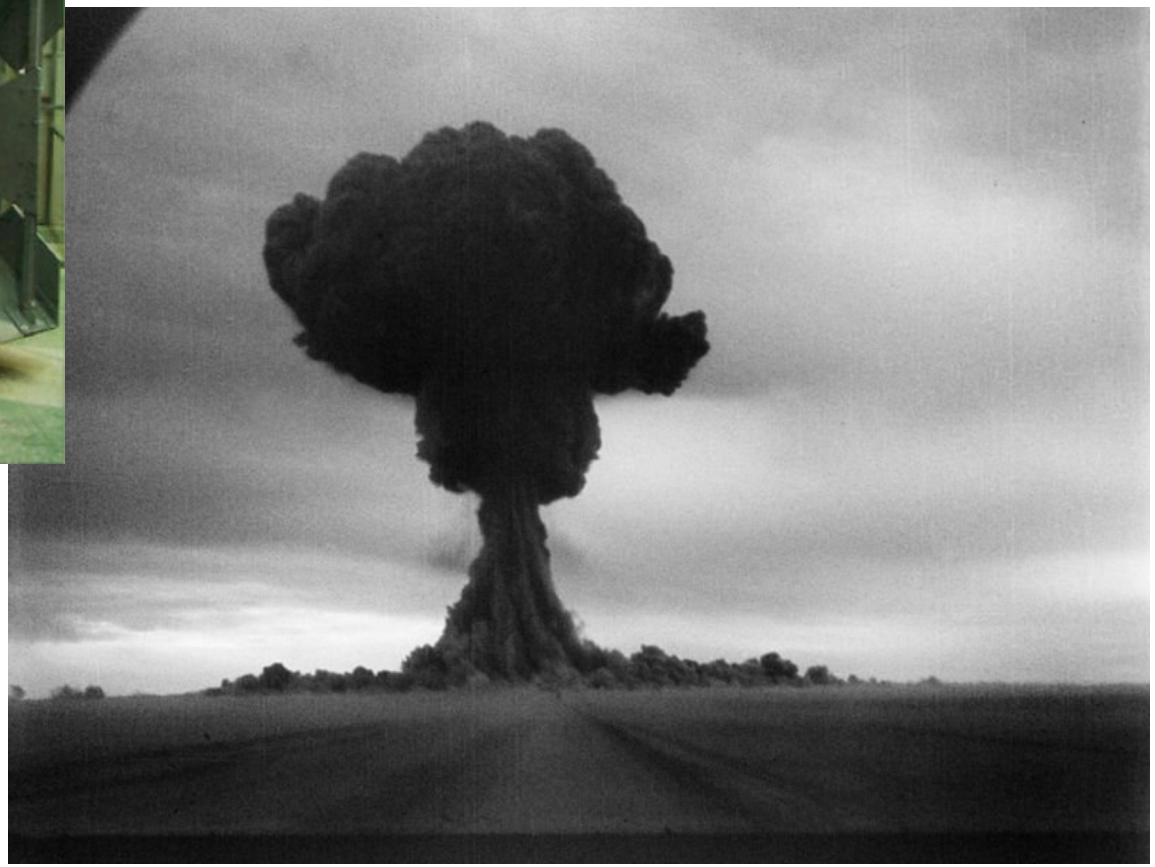
ATOMIC ENERGY COMMISSION
UNITED STATES OF AMERICA

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

Sandia Labs is established in Albuquerque in 1948

The Soviet Surprise



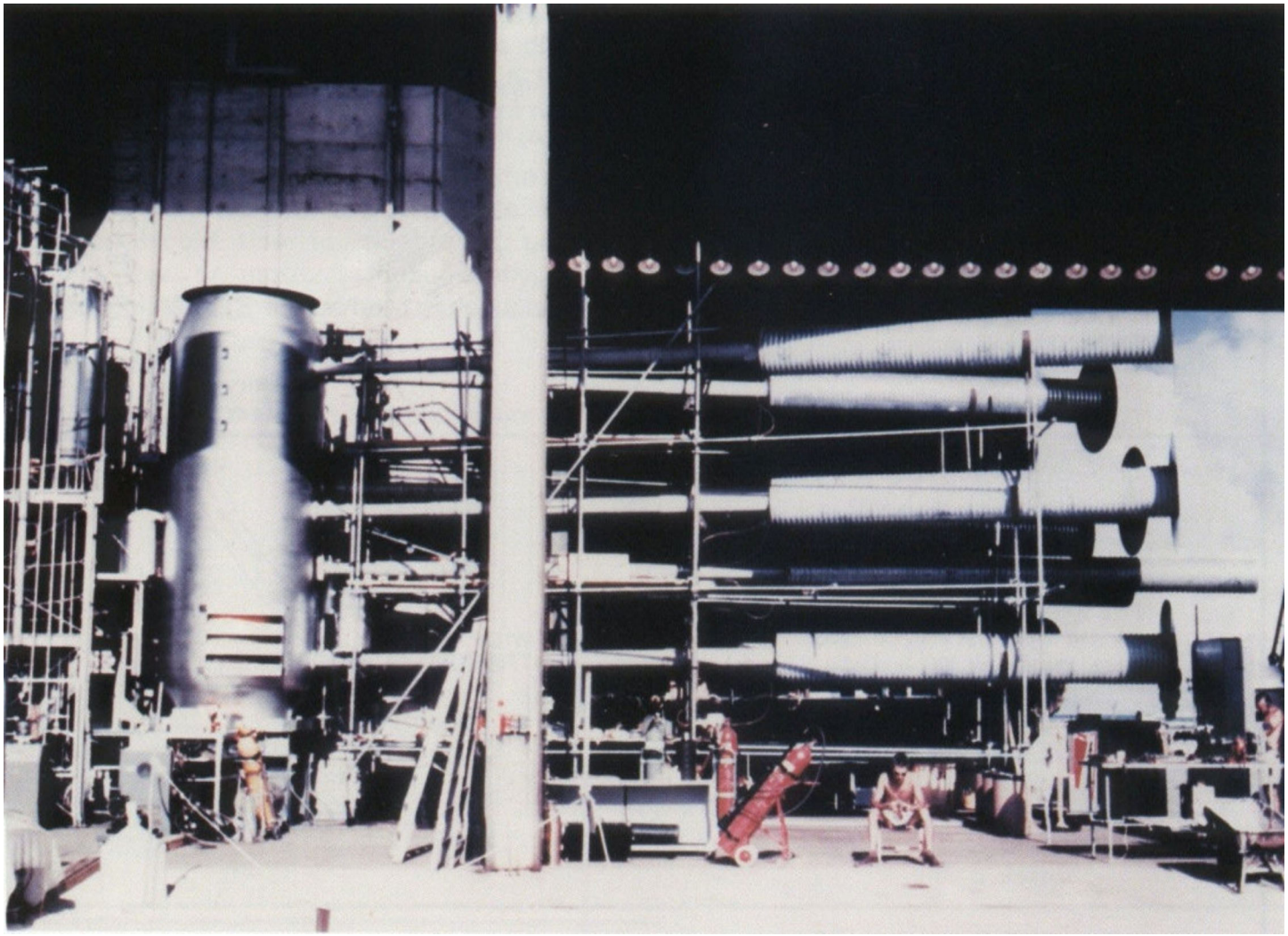


RDS-1 (“Joe-1”), and the first Soviet nuclear test

Calculating the Future

The MANIAC, completed in 1952.

The Thermonuclear Era

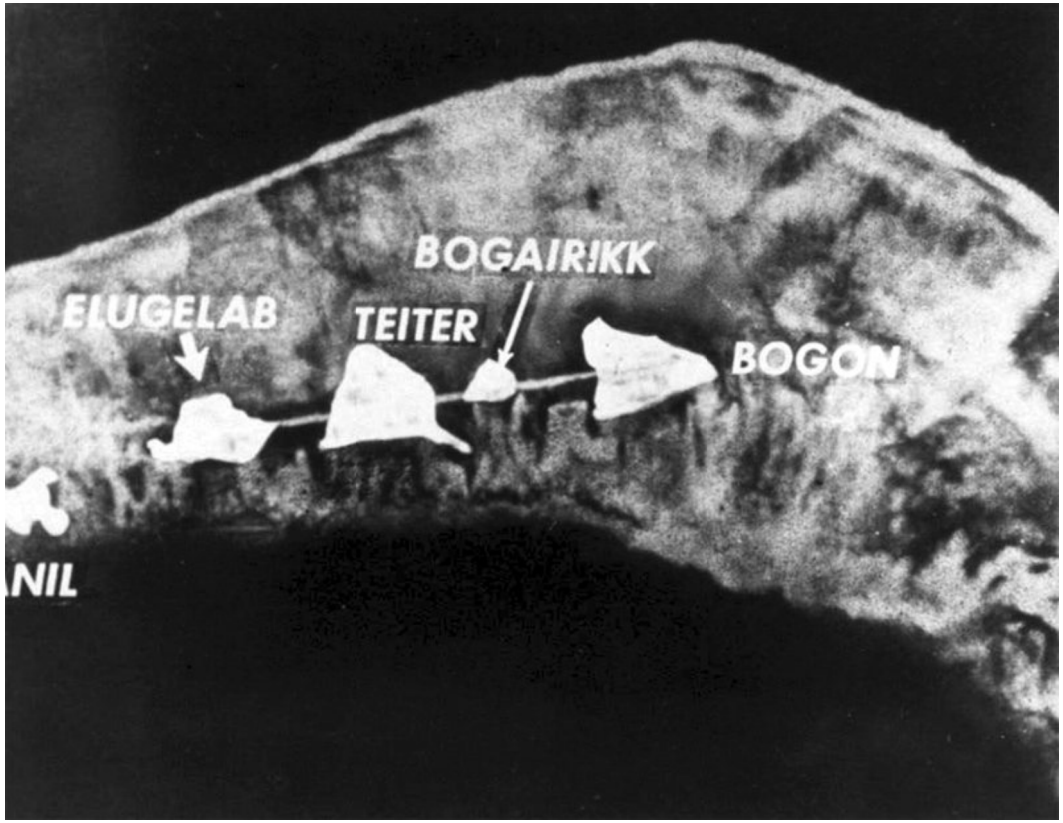


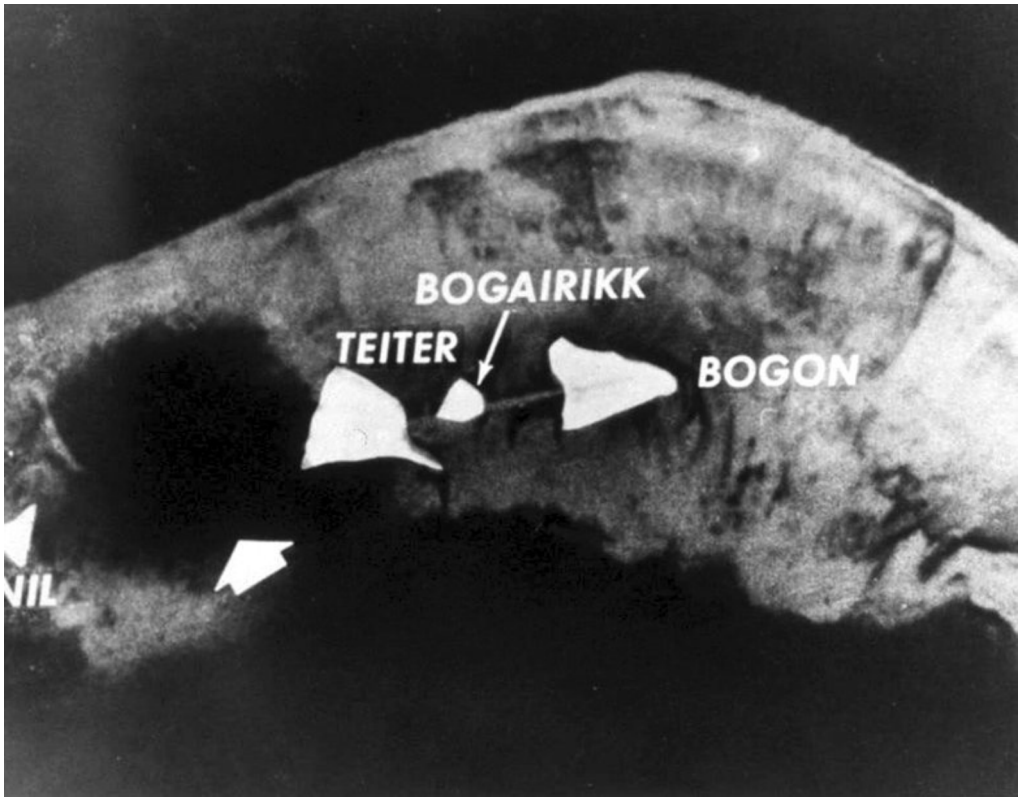
The massive Ivy Mike device, with physicist Conrad Longmire seated below for scale

The Thermonuclear Era

The Ivy Mike Test, November 1, 1952.

The Thermonuclear Era





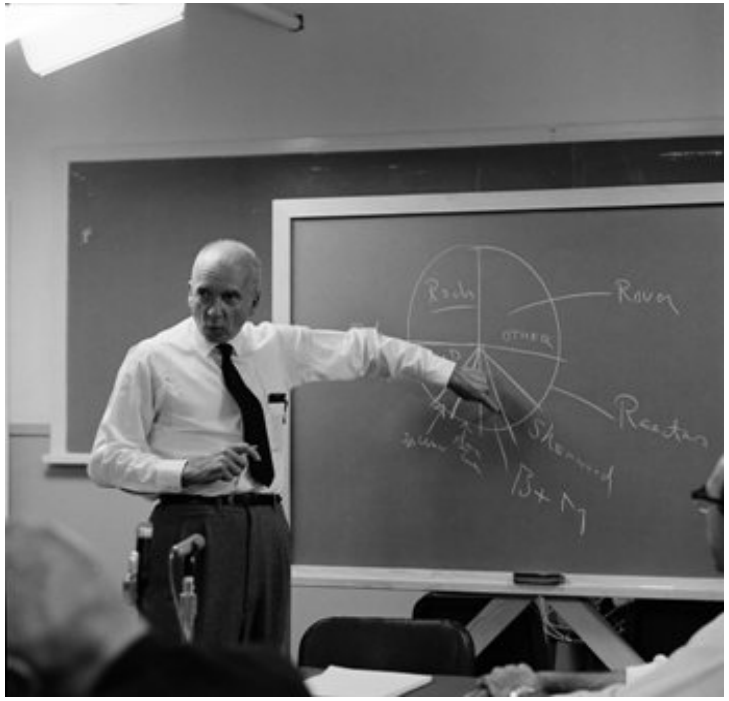
Enewetak Atoll before and after Ivy Mike detonation.

The Thermonuclear Era

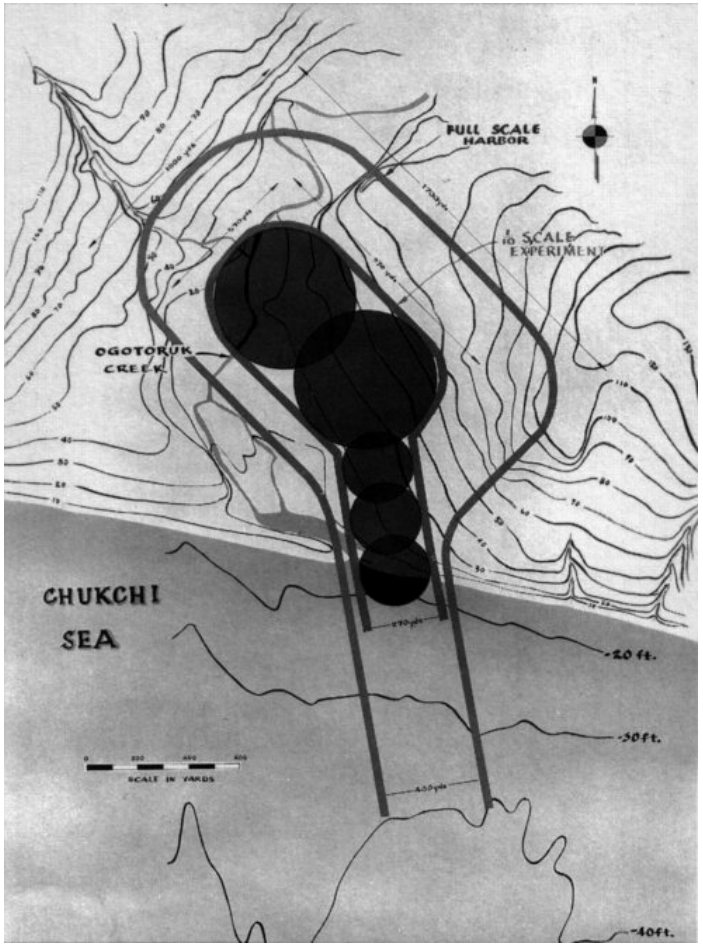
The Castle Bravo test of 1954.

Omega Bridge, 1957.

A Diversifying Mission



Norris Bradbury and the diversification of Lab research.



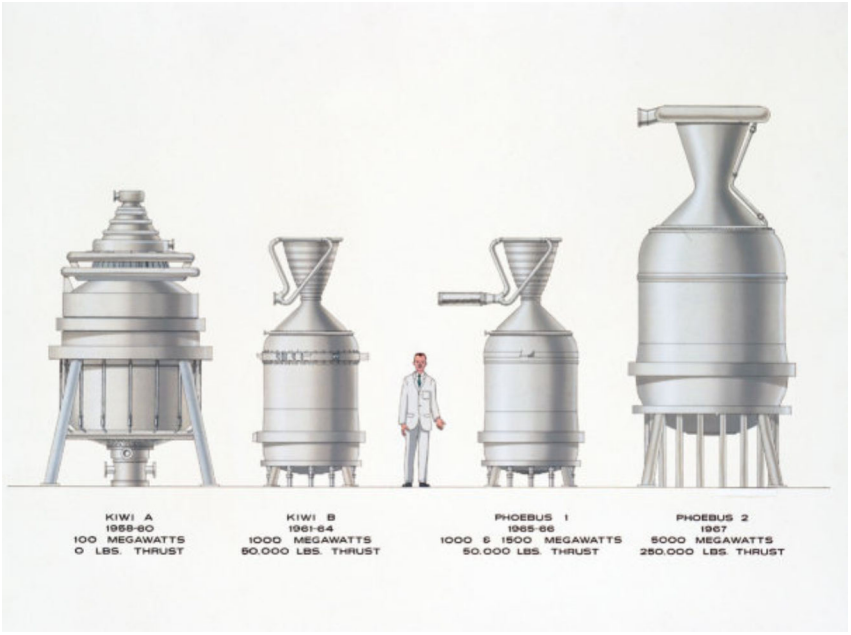
Plowshare proposed harbor excavation.

Project Rover “Kiwi” A Prime reactor.

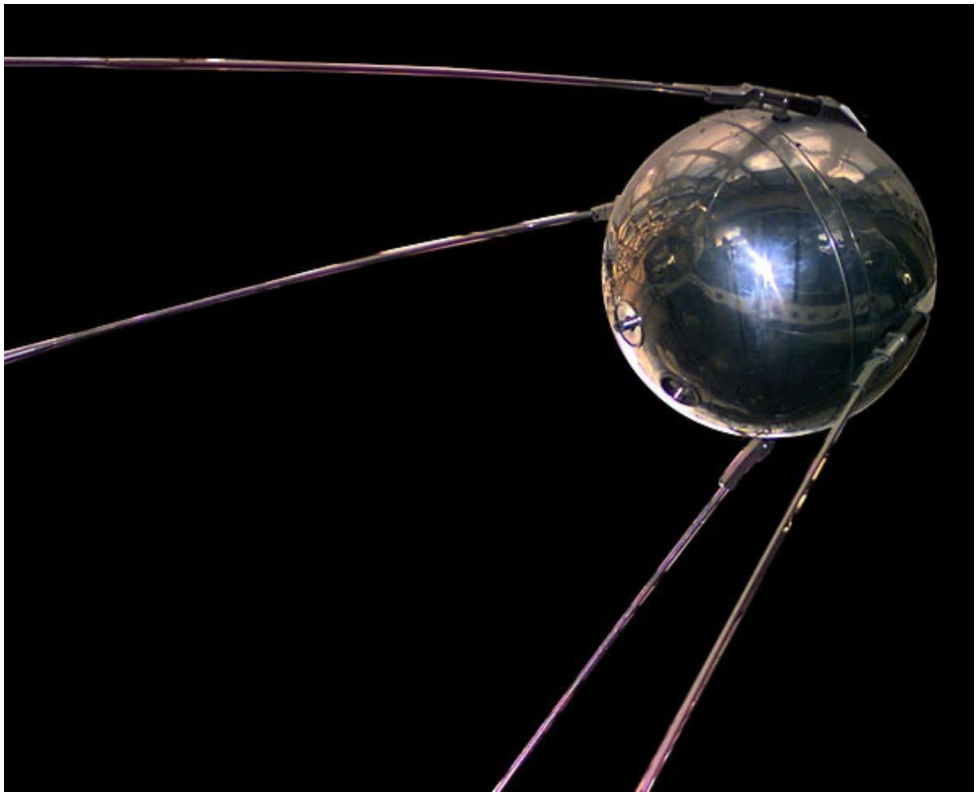
The Rover Program

Kiwi A

Phoebus 2A



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

The Escalating Cold War

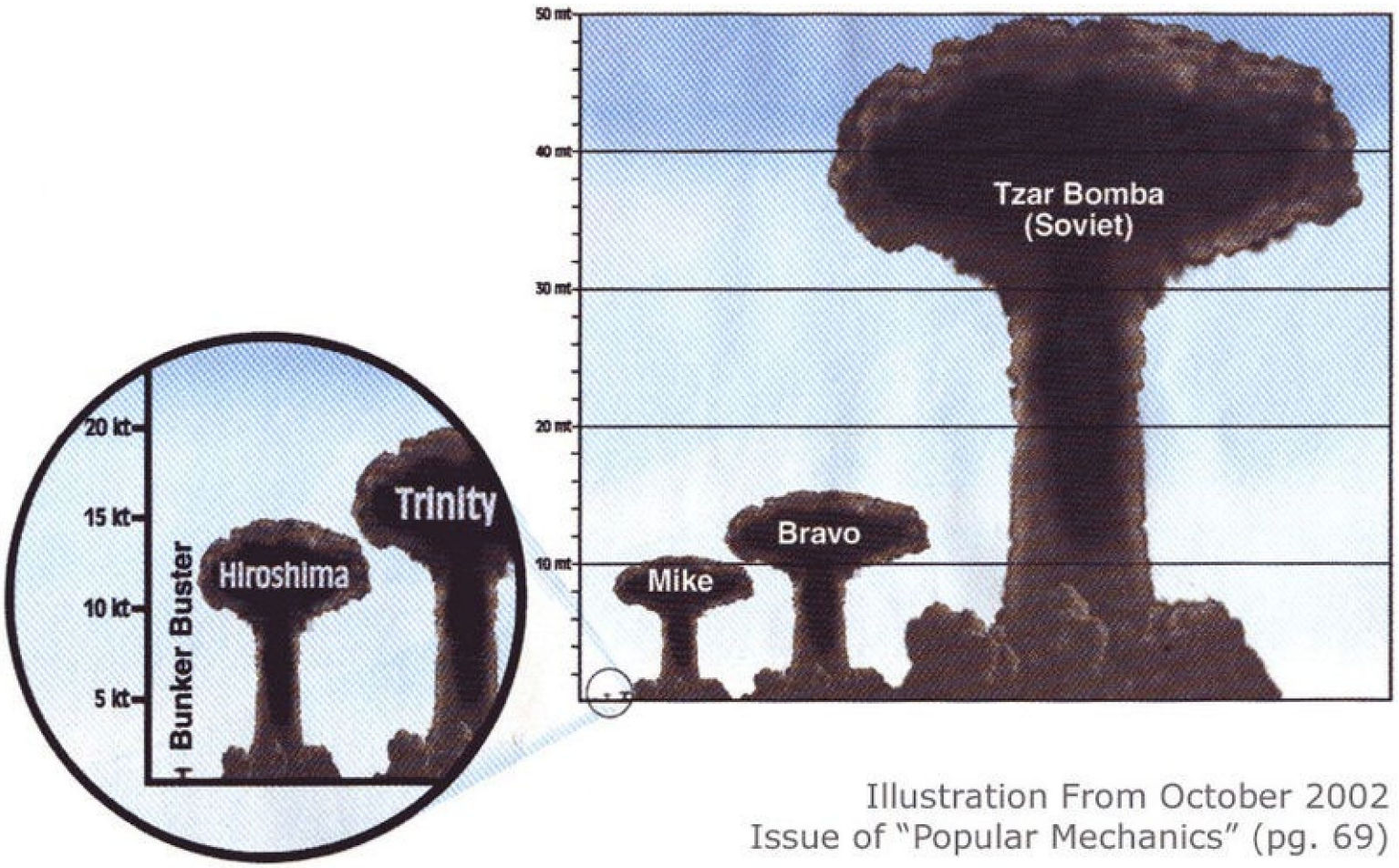


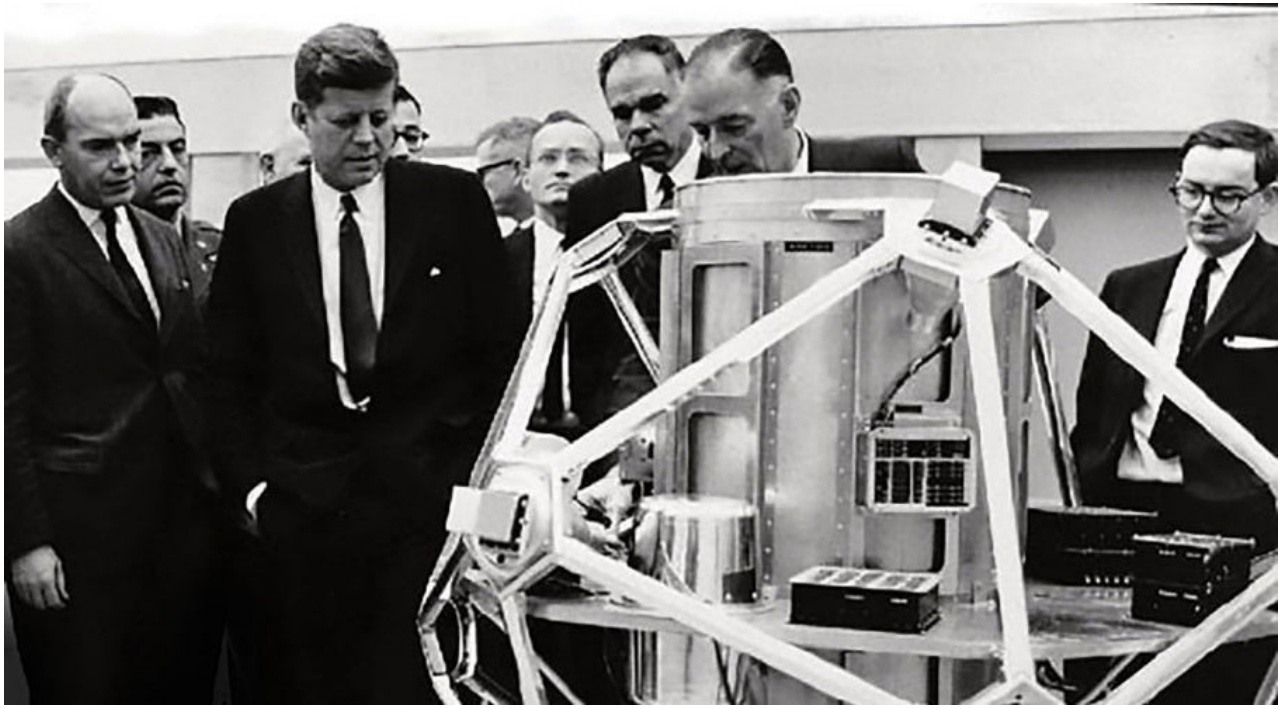
Illustration From October 2002
Issue of "Popular Mechanics" (pg. 69)

Tsar Bomba,
October 30, 1961.

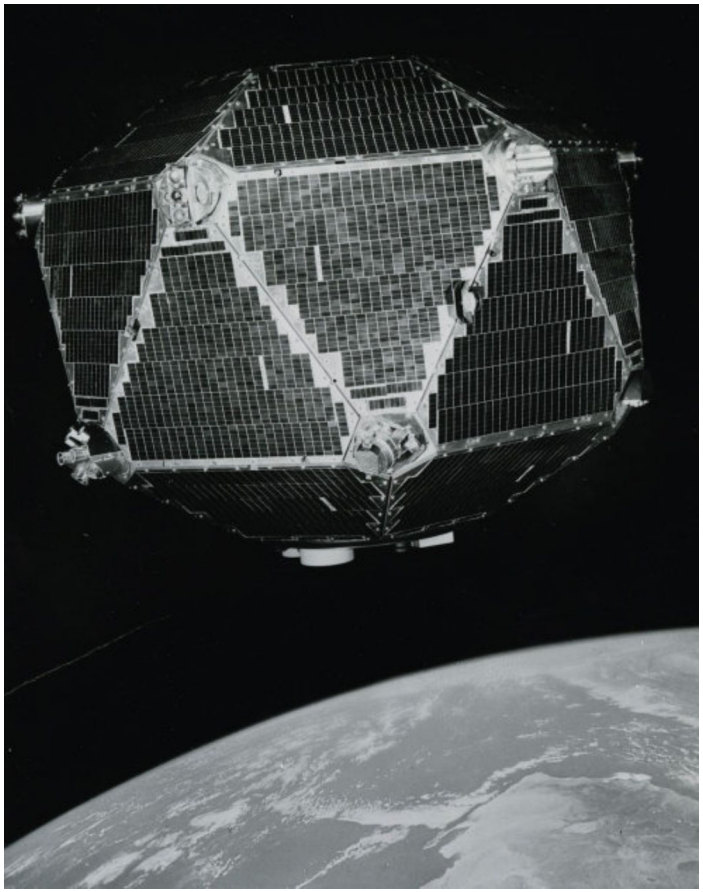
Testing Moves Underground

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

Vela and the Partial Test Ban Treaty



President Kennedy inspects a Vela satellite mockup, 1962.

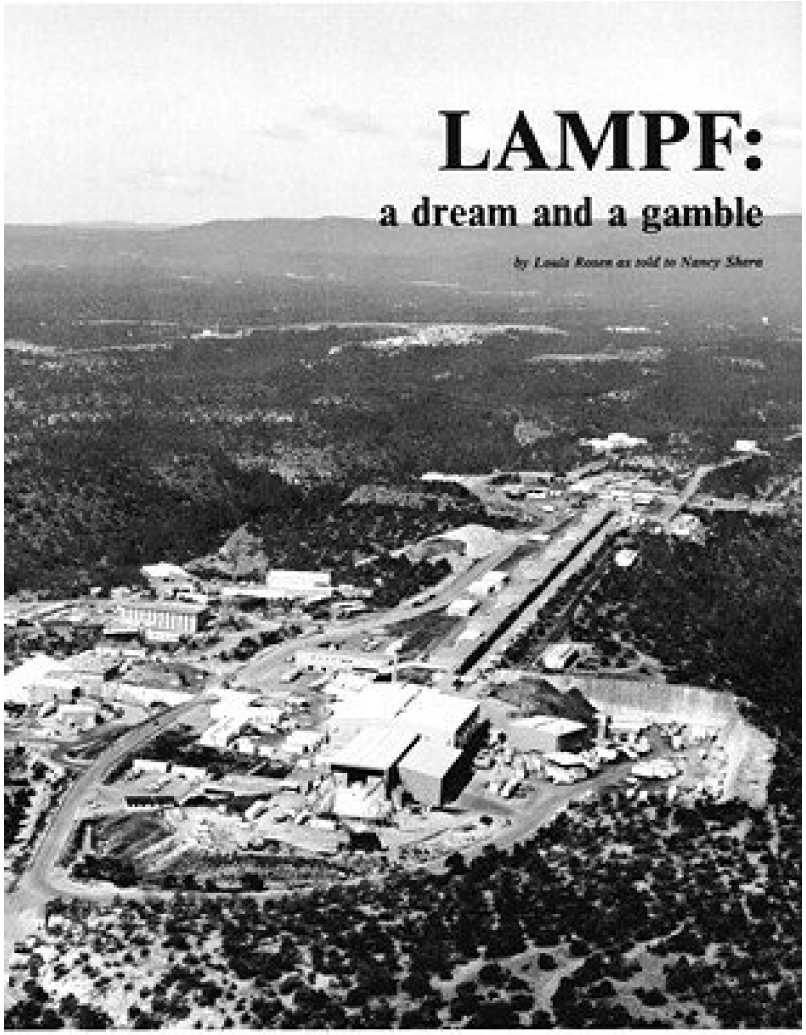


Artist depiction of a Vela satellite in orbit.

The Agnew Era

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

The 1970s



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

The 1970s

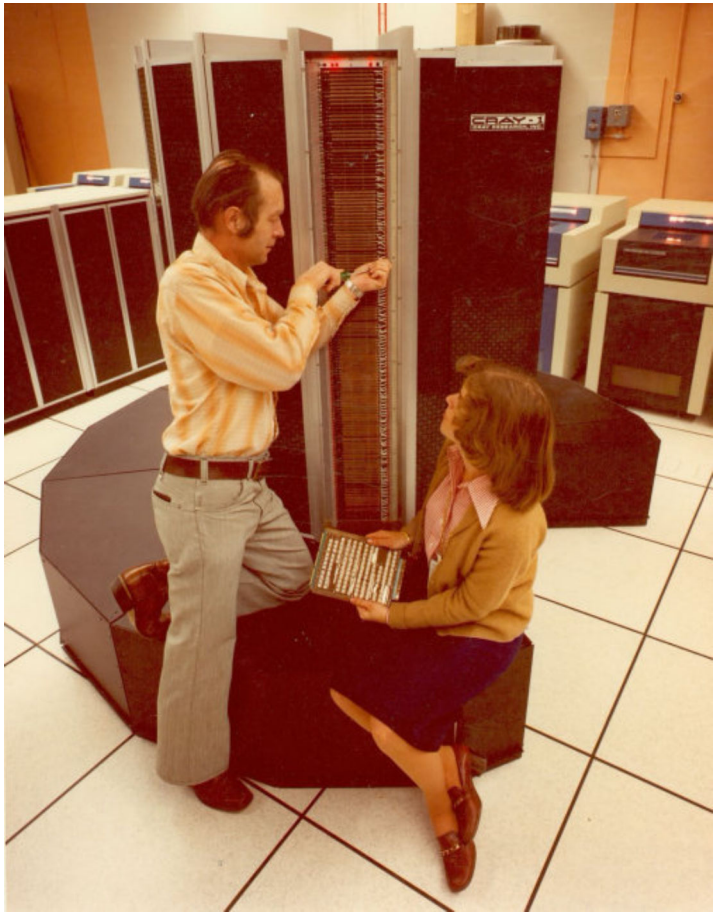
LOS ALAMOS SCIENTIFIC LABORATORY
OF THE UNIVERSITY OF CALIFORNIA
LOS ALAMOS, NEW MEXICO

LOS ALAMOS SCIENTIFIC LABORATORY

ERDA and the NRC replaced the AEC in 1974.

The 1970s

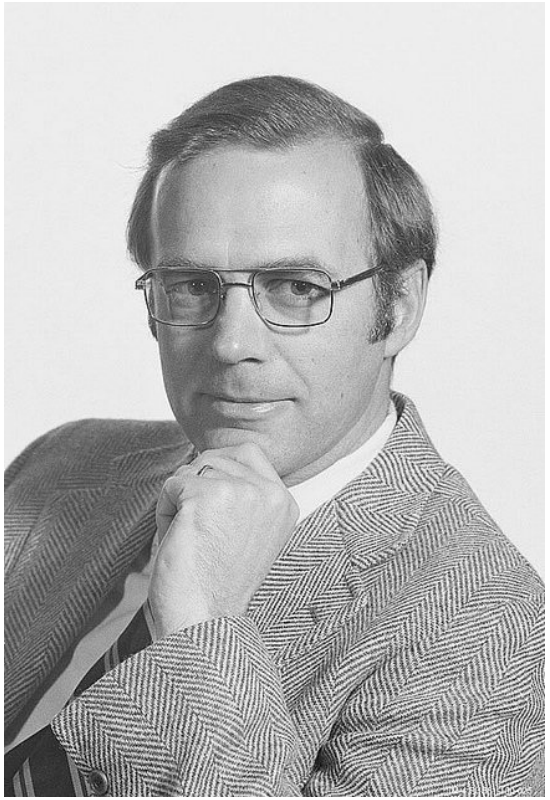
Research Library built with slanted roof for solar panels, as was the Otowi Building.



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

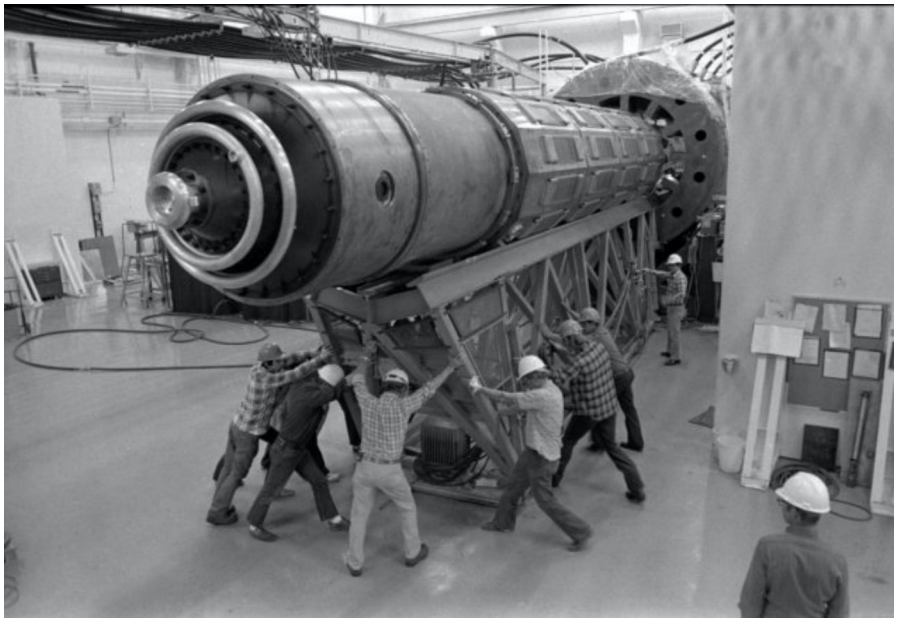
Department of Energy, formed1977.

Donald Kerr and the early 1980s



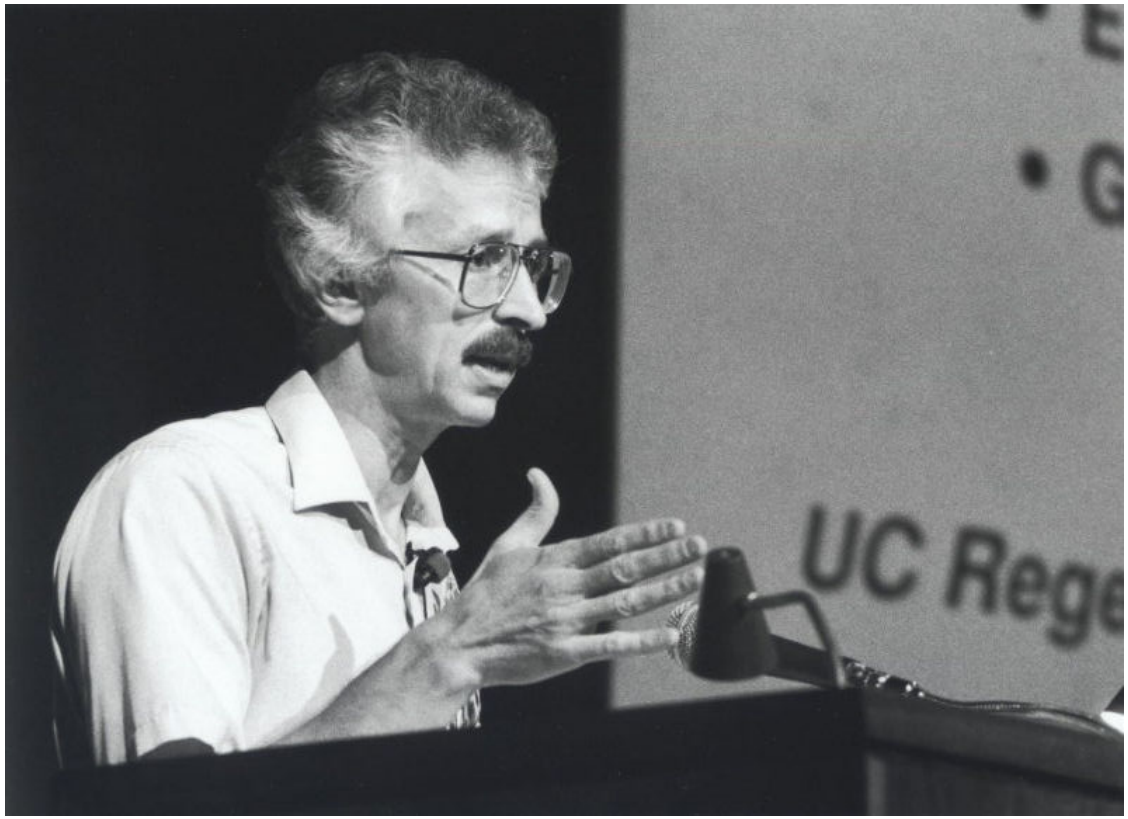
Donald Kerr
(Dir. 1979 – 1985).

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



Antares CO_2 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.

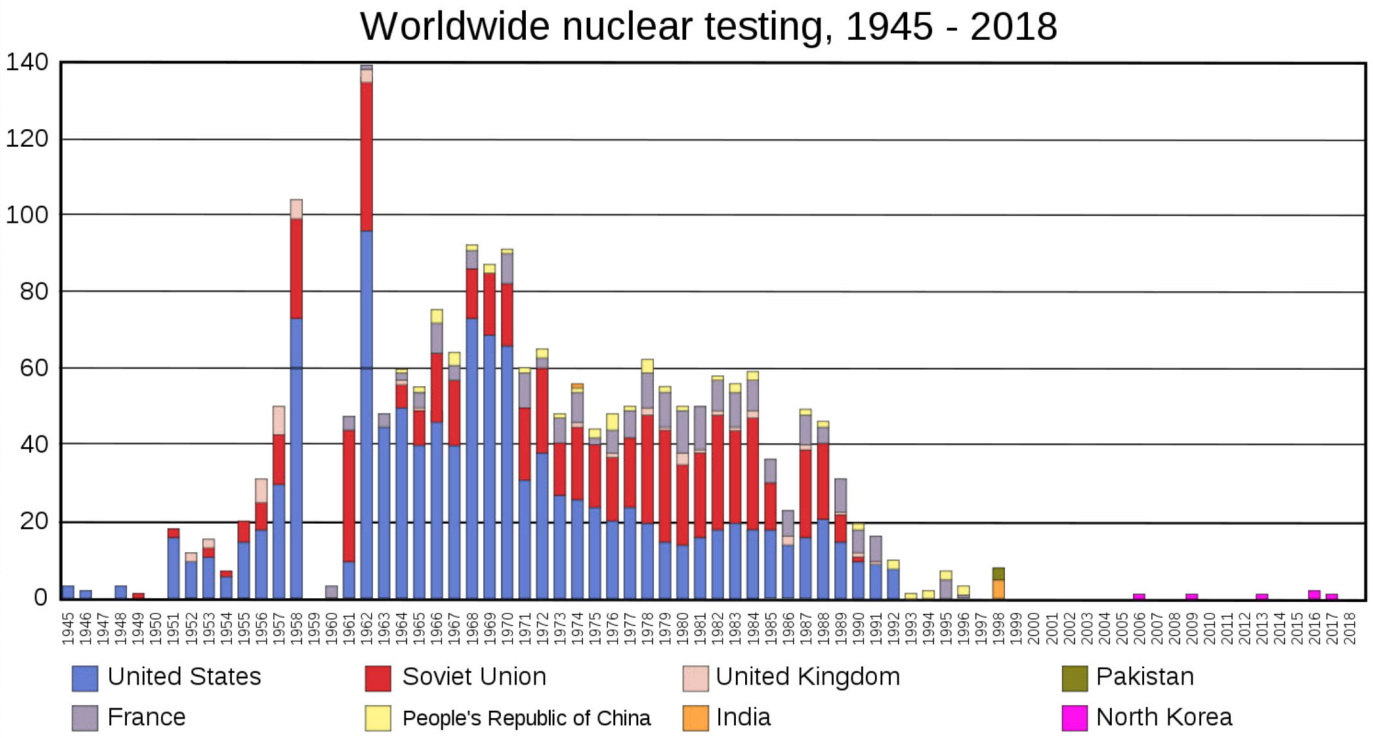
Sig Hecker and the Last Years of the Cold War

*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.



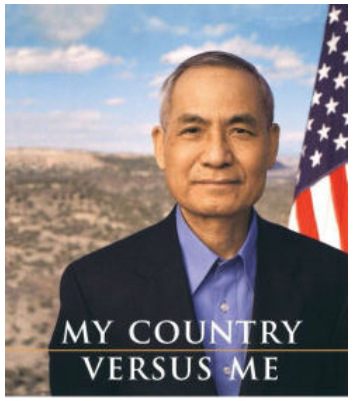
Stockpile Stewardship

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


Nicholas C. Metropolis Center
For Modeling & Simulation

Troubles and Reinvention

John Browne
(Dir. 1997-2003)



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)

The Las Conchas fire, June-August 2011 burned over 150,000 acres

Demolition of Administration Building, October 2011.

The LANS Era

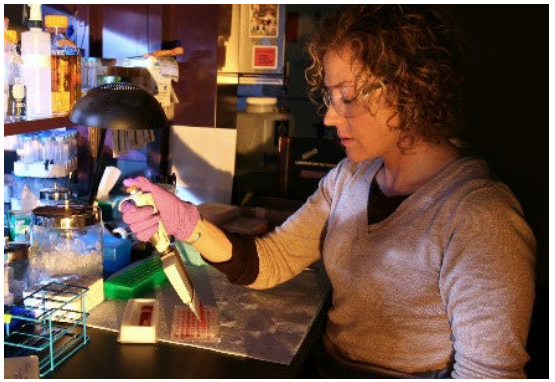
Roadrunner supercomputer

Terry Wallace, Jr.
(Dir. 2018)

LANL Today

Thomas Mason (Dir. 2018-Present)

Los Alamos NATIONAL LABORATORY



Our Heritage of Innovation

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