Title:	An Overview of Los Alamos Weapons Program
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An Overview of Los Alamos Weapons Program

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Los Alamos
NATIONAL LABORATORY
EST 1943

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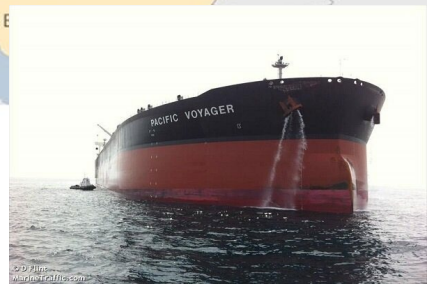
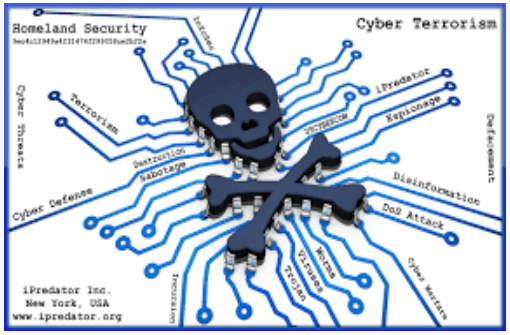
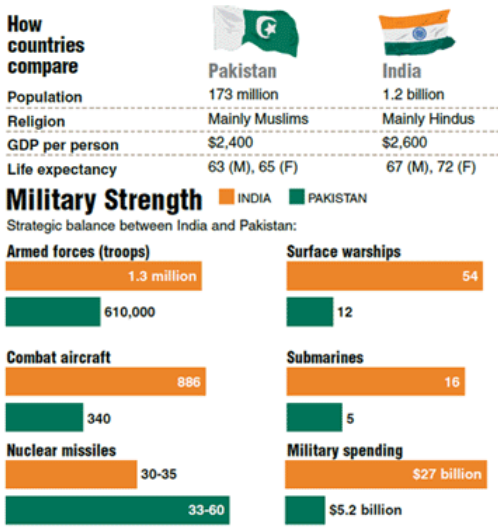
National Nuclear Security Administration
Managed by Triad National Security, LLC for the U.S. Department of Energy's NNSA

21st century geopolitical realities are challenging the existing security/political/economic structures and institutions

- Revanchist Russia
- Expansionist China
- Confrontational North Korea
- Turmoil in Europe
- Chaos in Middle East
- Nuclear proliferation
- Terrorism/Cyber
- Resource competition







The geopolitical realities demand the Laboratory's excellence for solutions to national security

- @12,000 employees
  - 2200 PhDs
  - 1100 veterans
  - @1800 summer students
- $2.8B budget
- 36 square miles
- 47 technical areas
- 1,280 buildings / 9M sq. feet
  - 11 nuclear facilities
- 268 miles of roads (100 paved)

LANL is hiring @1000 new employees annually

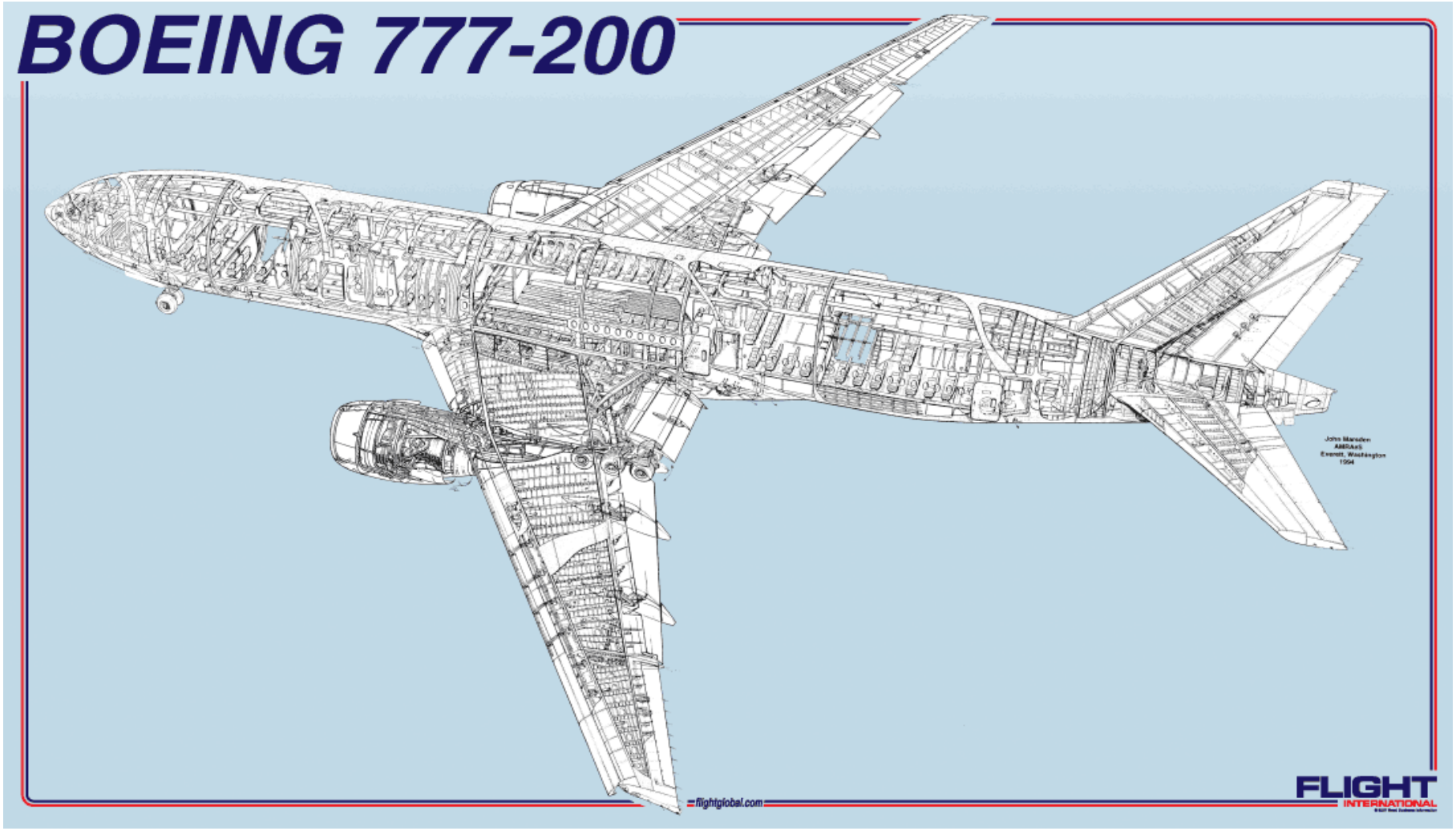
LANL is *the* design laboratory for the majority of the Nation's on-alert deterrent

W76
W88
} US Navy

W78
B61
} US Air Force

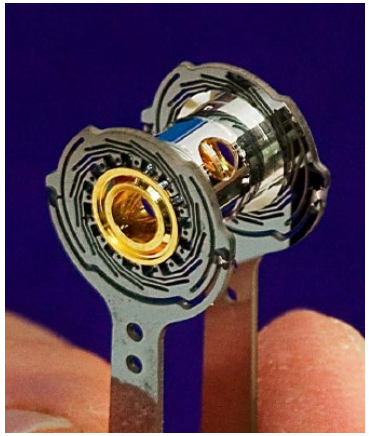
"Nuclear weapons have and will continue to play a critical role in deterring nuclear attack and in preventing large scale conventional warfare between nuclear armed states… "
Former Secretary of Defense Jim Mattis, Nuclear Posture Review

Would you fly in it after its been parked for 20 + years?



Science, engineering and computations underpins all national security work of the laboratory

- **Experiments**
  - 1000s experiments conducted annually to further our understanding and confidence in the stockpile
- **Modeling and simulation**
  - World class computing hardware/software
- **Designer judgement**
  - Experimental data used to check judgement
  - Train next generation

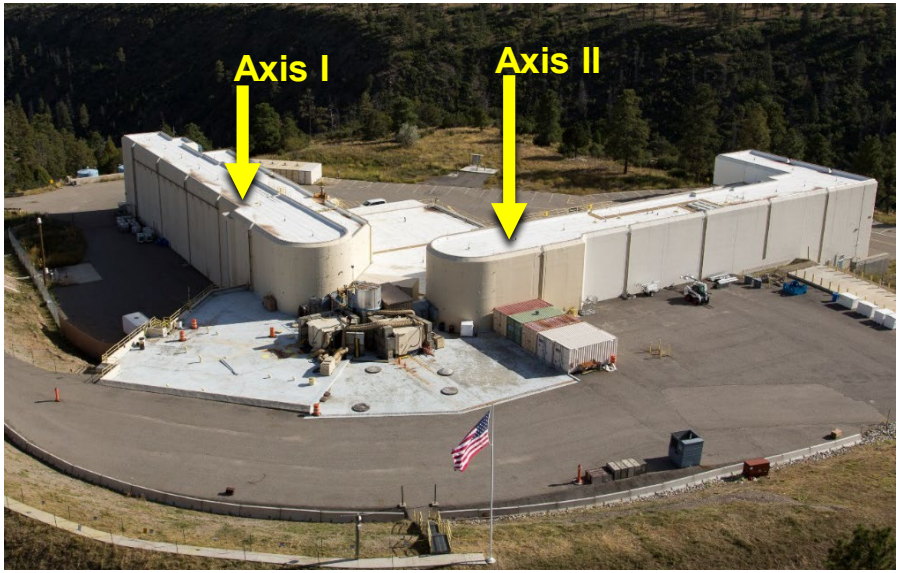


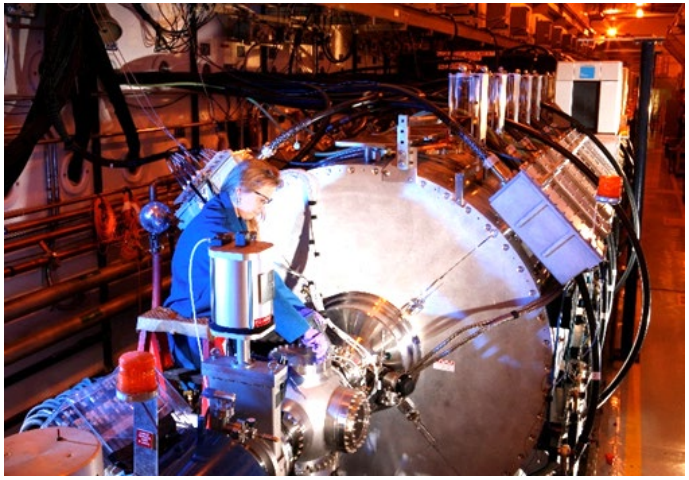
High Energy Density (HED) Experiments

Large bore powder gun – measure differences in performance of weapon materials of interest

World class radiographic capabilities supports LANL/LLNL weapons and global security programs

- DARHT world-class X-ray radiography for non-nuclear tests
- Axis I: single image
- Axis II: four images
- Experiments fully contained to reduce environmental impacts and increase shot rate





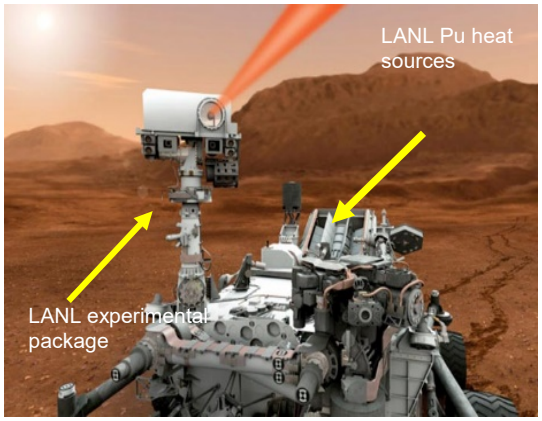
Petascale Supercomputing is critical to Los Alamos' national security missions

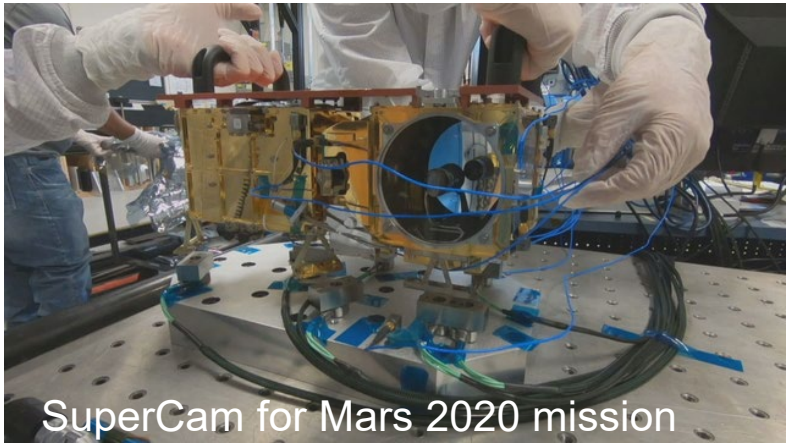
- Stockpile challenges are increasingly complex as systems continue to age
- DARHT, LANSCE etc provide large data sets to resolve stockpile challenges
- Data sets require ever more capable machines that can quickly process information
- Capacity and Capability machines
  - Trinity
  - Fire, Ice

Los Alamos: center for plutonium excellence and critical to science and security

- **Deliver parts for LANL experimental science**
- **Deliver parts for DoD Mission**
  - 30 pits per year 2030
  - Partner with STRATCOM, Global Strike, USAF, USN…….
- **Deliver parts for NASA and other federal agencies**
- **Provide technical options to meet new and emerging challenges**
  - IAEA training
  - Additive manufacturing

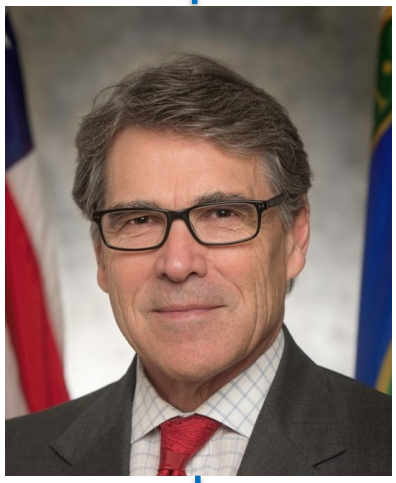
Mars Curiosity Rover





IAEA
International Atomic Energy Agency

By law, Los Alamos Director reports on the state and health of the Nation's deterrent



UNITED STATES CONGRESS

LANL's multidisciplinary science and engineering capability

A Final Thought

“This Laboratory has always been something of wonder. Everyone one of you should be very proud that you are part of it. Take note it does wonderful things. Do well with it.”

Roger Rasmussen
Trinity eyewitness
LANL employee 1944-2005

Rasmussen 1921-2017