National Security Science

Science and Engineering Solving Challenges for Today and Tomorrow

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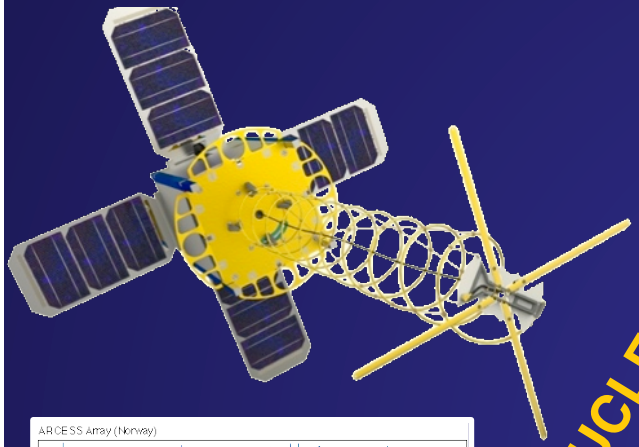
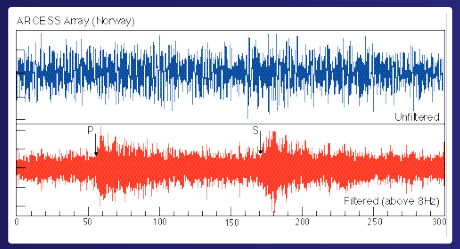
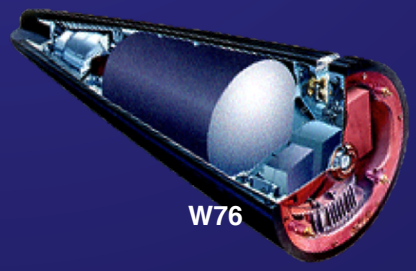
Operated by Los Alamos National Security, LLC for the U.S. Department of Energy's NNSA

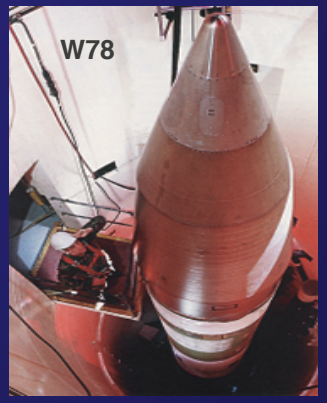
Strategic Deterrence
LANL's nuclear mission



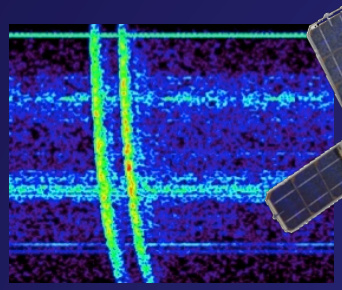


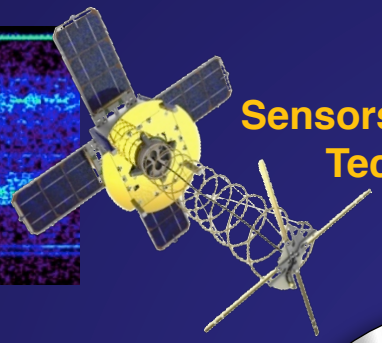
STOCKPILE STEWARDSHIP





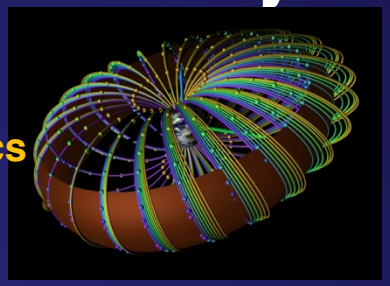
LANL is a National Security Science Laboratory





Sensors & Detection Technology

HPC, Modeling, Simulation & Big Data Analytics

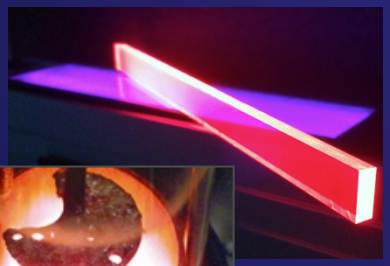


Unique Testing & Experimentation Facilities

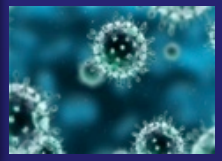
Explosives

Stockpile Stewardship

Chemistry



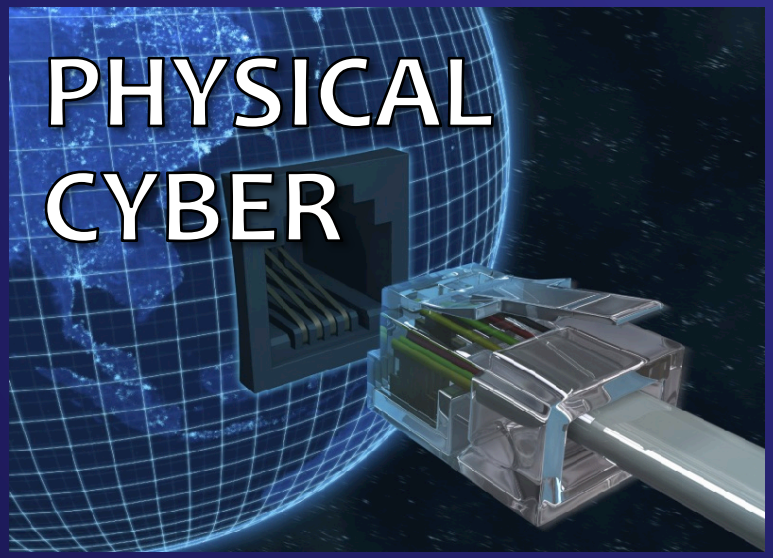
Materials

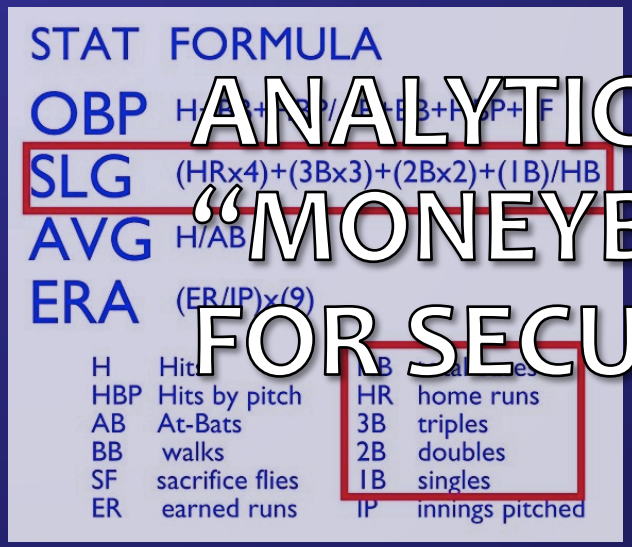


Biosecurity

Physics & Nuclear Engineering

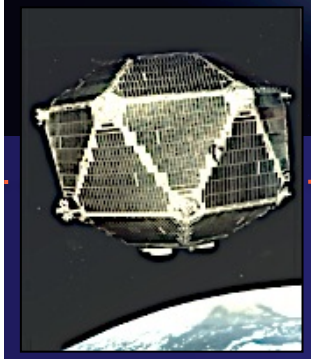
Preparing for the Future of Warfare





ANALYTICS:
"MONEYBALL"
FOR SECURITY

Celebrating more than 50 years of Los Alamos missions in space



1963: Our Vela satellites, built for nuclear detection, discovered cosmic gamma-ray bursts

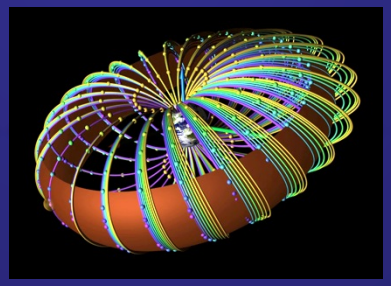
1969: Our RTG is first electrical generator with power from radioactive decay

1984: LANL x-ray detector launched aboard GPS satellite

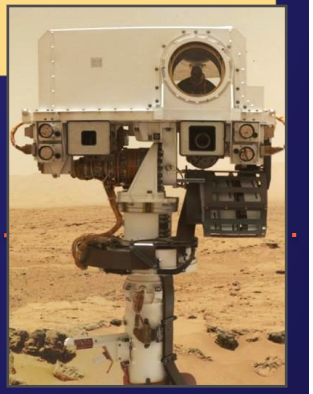
1989: LANL tested accelerator technology as a potential anti-missile weapon

1997: LANL sensors launched aboard Cassini to Saturn

2002: LANL instruments found indications of water on Mars

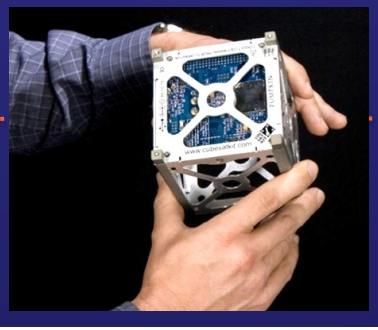


2006: LANL's DREAM model predicted space radiation & hazards



2006: Our Raptor discovered the birth of stellar-size black holes

2010: LANL built and launched four miniscule satellites —CubeSats



2013: LANL's ChemCam met Mars

New technology sees what cannot be seen

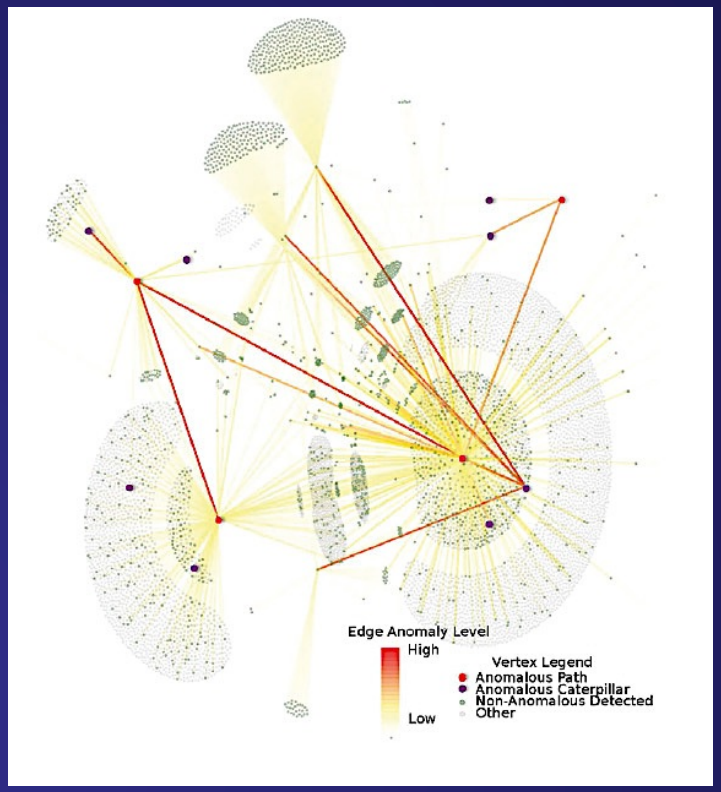
Muon Tomography
Fukushima, Japan
This Los Alamos tool is the best hope to assess damage in the reactor cores, locate melted fuel, and minimize radiation dose to workers.

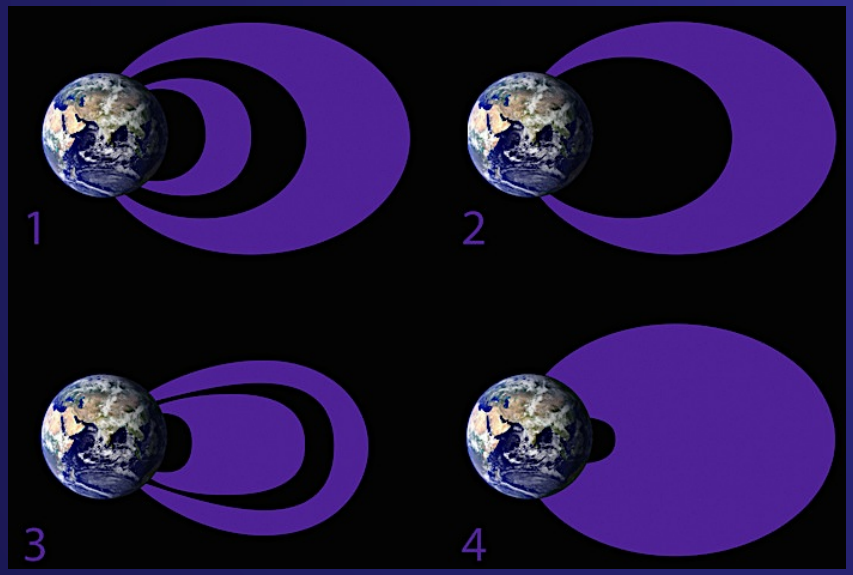
Hyper-spectral Imaging
Tianjin, China
LANL characterized chemical compounds from this fiery explosion using imagery from social media and i-Technology.

Predictive Data Analytics

Cyber Defense: PathScan

Builds statistical models to characterize the normal flows of traffic between each pair of communicating computers. Then passively monitors these paths and tests whether the flows observed are expected in the context of the statistical models. If a flow becomes unlikely, an adversary could be moving through the network.





Space Weather: Van Allen Belts

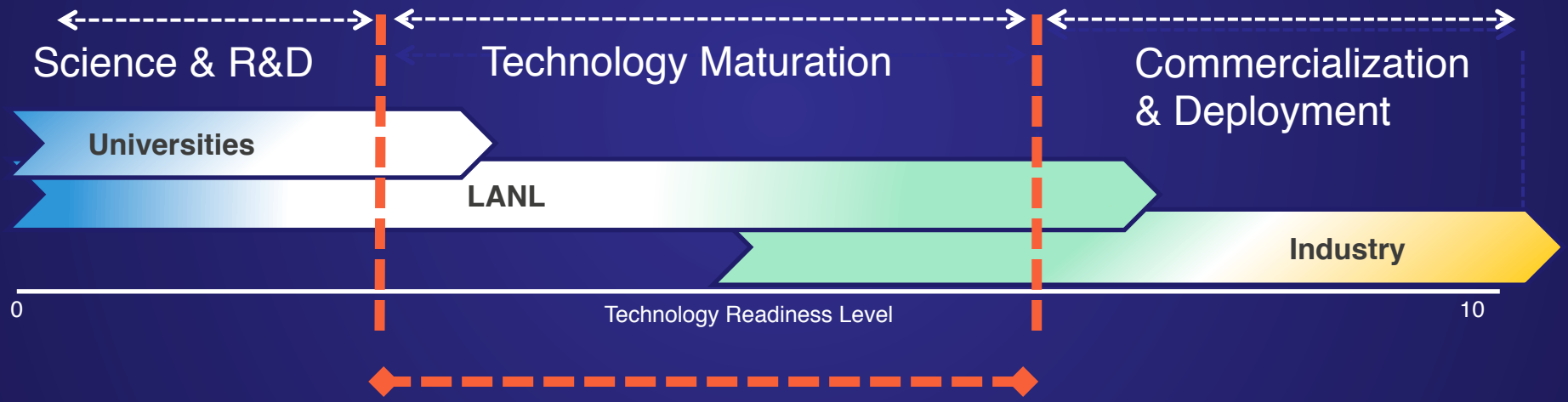
"The shape of the belts is actually quite different depending on what type of electron you're looking at…It's like listening to different parts of a song. The bass line sounds different from the vocals, and the vocals are different from the drums, and so on."

Geoff Reeves, LANL PI

Collaboration & Partnerships with Los Alamos

Sponsored Research Projects
(Industry/Defense Contractors)
- CRADAs
- Non-Federal Work For Others/ Consulting Agreements

Work-for-Others Agreements
(Government)
- Interagency Agreements
- MIPRs



The Challenge:
Bridging this gap for strong current technologies

Los Alamos
NATIONAL LABORATORY
EST.1943

Delivering science and technology
to protect our nation
and promote world stability

NNSA
National Nuclear Security Administration

Operated by Los Alamos National Security, LLC for the U.S. Department of Energy's NNSA