



**Precision Strike Annual Review**  
**18 March 2014**

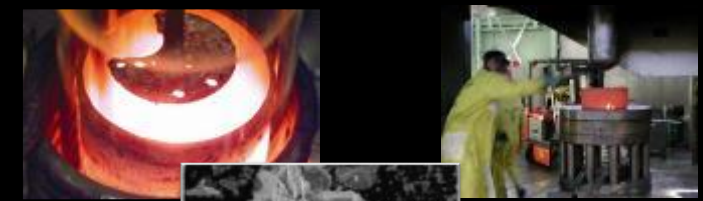
**MG (Ret) Doug Anson**  
**Director, DoD Strategic Development**



# Los Alamos: A National Security Laboratory (2013 NDAA)



**Physics & Nuclear Engineering**



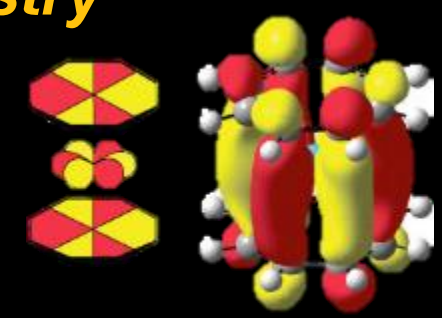
**Materials**



**Explosives**



**Chemistry**



**Bio & Biosecurity**

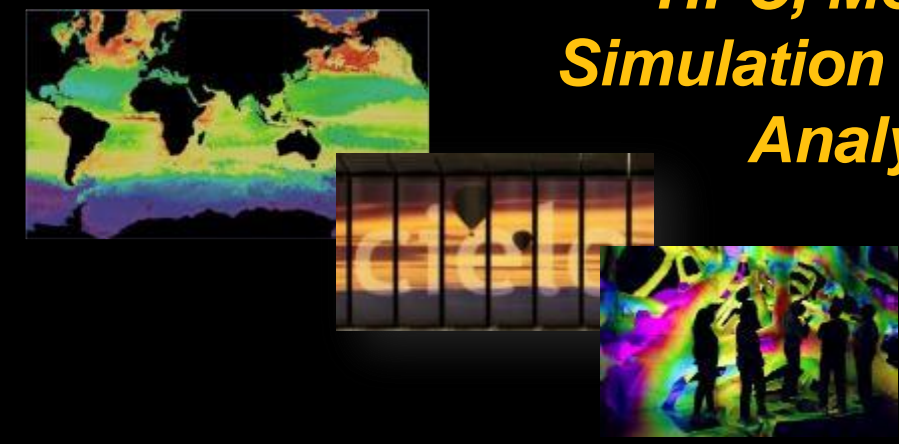
**Sensors & Detection Technology**



**Unique Testing & Experimentation Facilities**



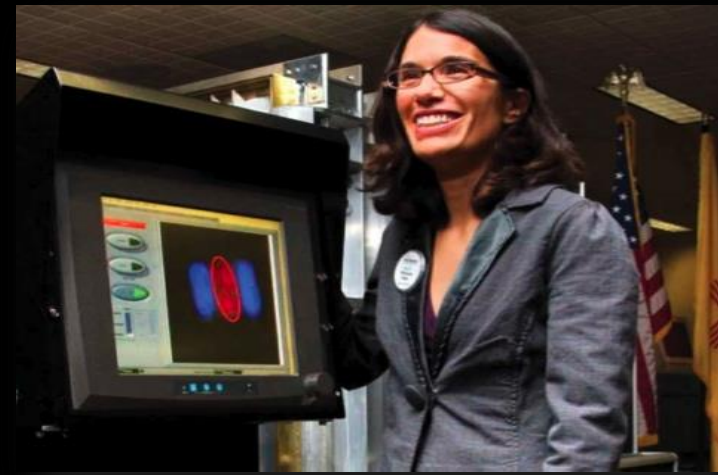
**HPC, Modeling, Simulation & Big Data Analytics**







# Los Alamos Global Security Directorate — *All Things Nuclear & Emerging Threats*

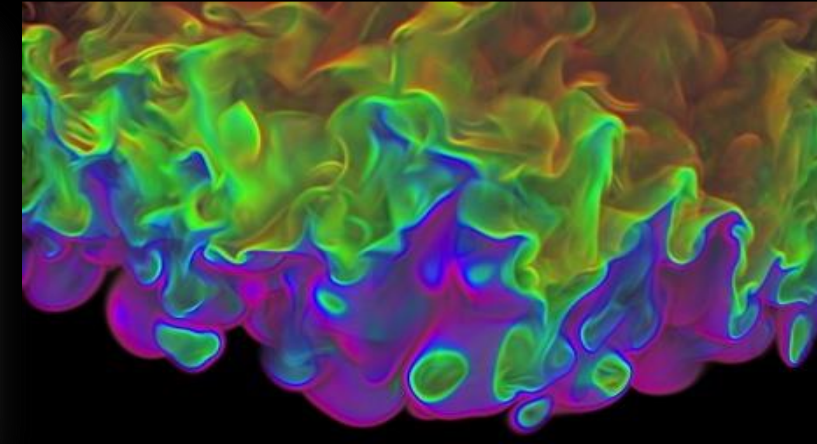
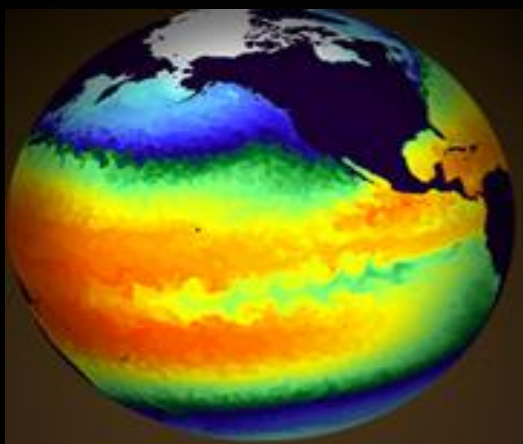
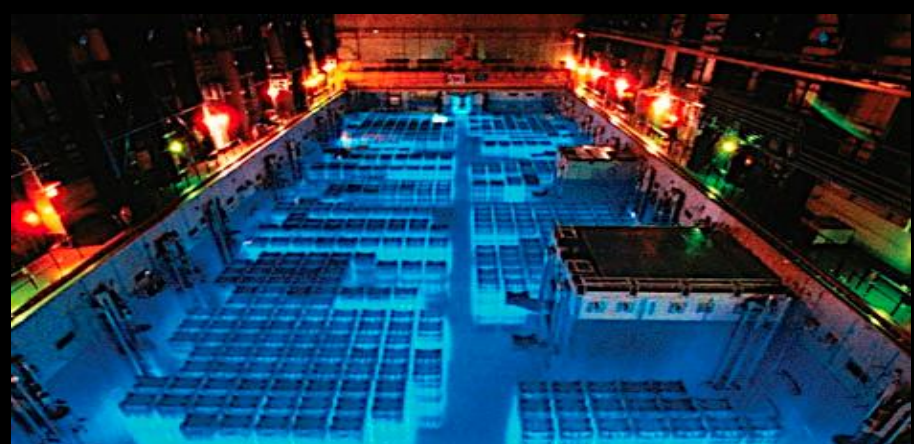
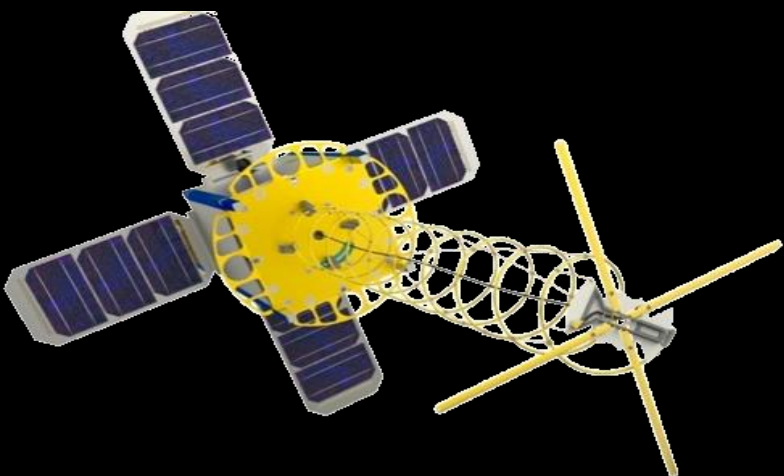


**US Nuclear Deterrent**

**Protecting against the Nuclear Threat**

**Emerging Threats & Energy Security**

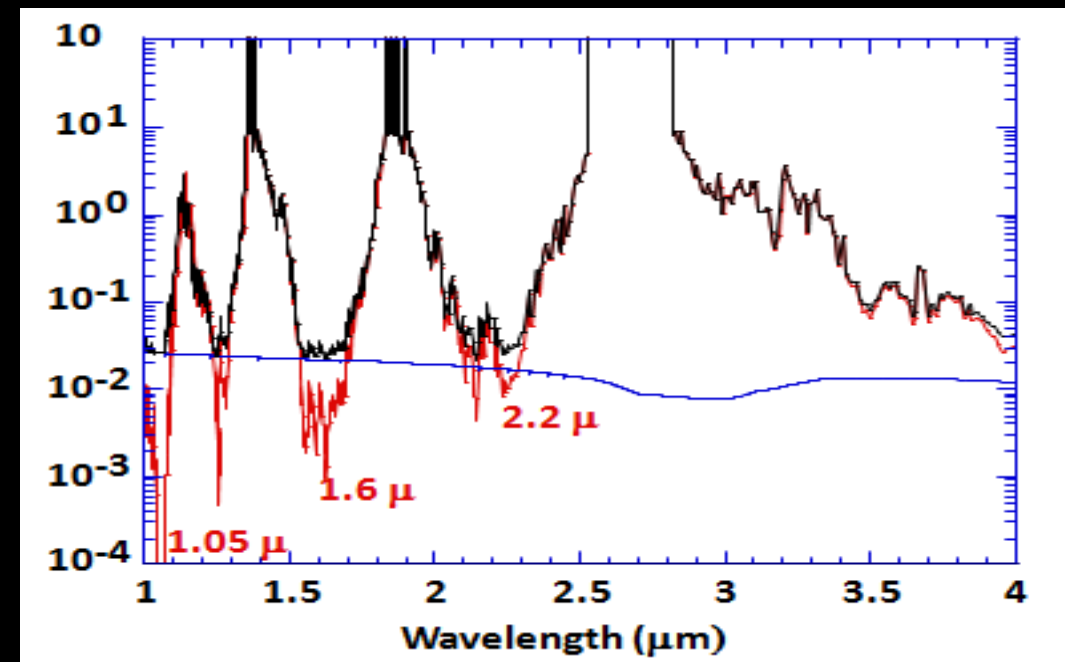
**Science, Technology & Engineering Capabilities**





# Free Electron Laser (FEL)

Los Alamos is developing a Megawatt-class FEL for ship-board defense against ballistic missiles and “swarmed threats”



## Requirements:

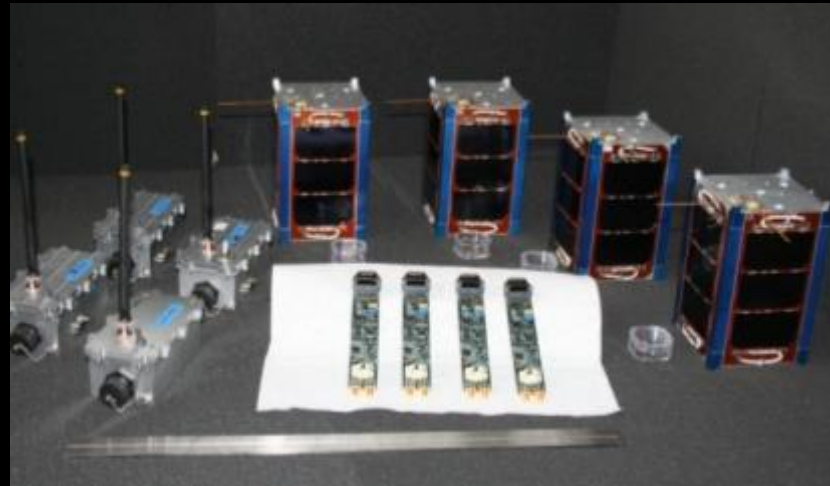
- High-quality laser beam that can be propagated over long distances
- All-electric laser requiring only electricity and water (no chemicals)
- FEL light wavelengths tuned to match transmission bands in the atmosphere
- Power that can be dialed to match other applications (e.g., power beaming, LADAR)

Status: Navy FY12-16 FEL program is in “MW Technology Maturation Development.” Navy will engage industry in FY16-17 for multi-year MW FEL demo if sufficient technical progress is demonstrated.

# Cube Satellites & Constellations

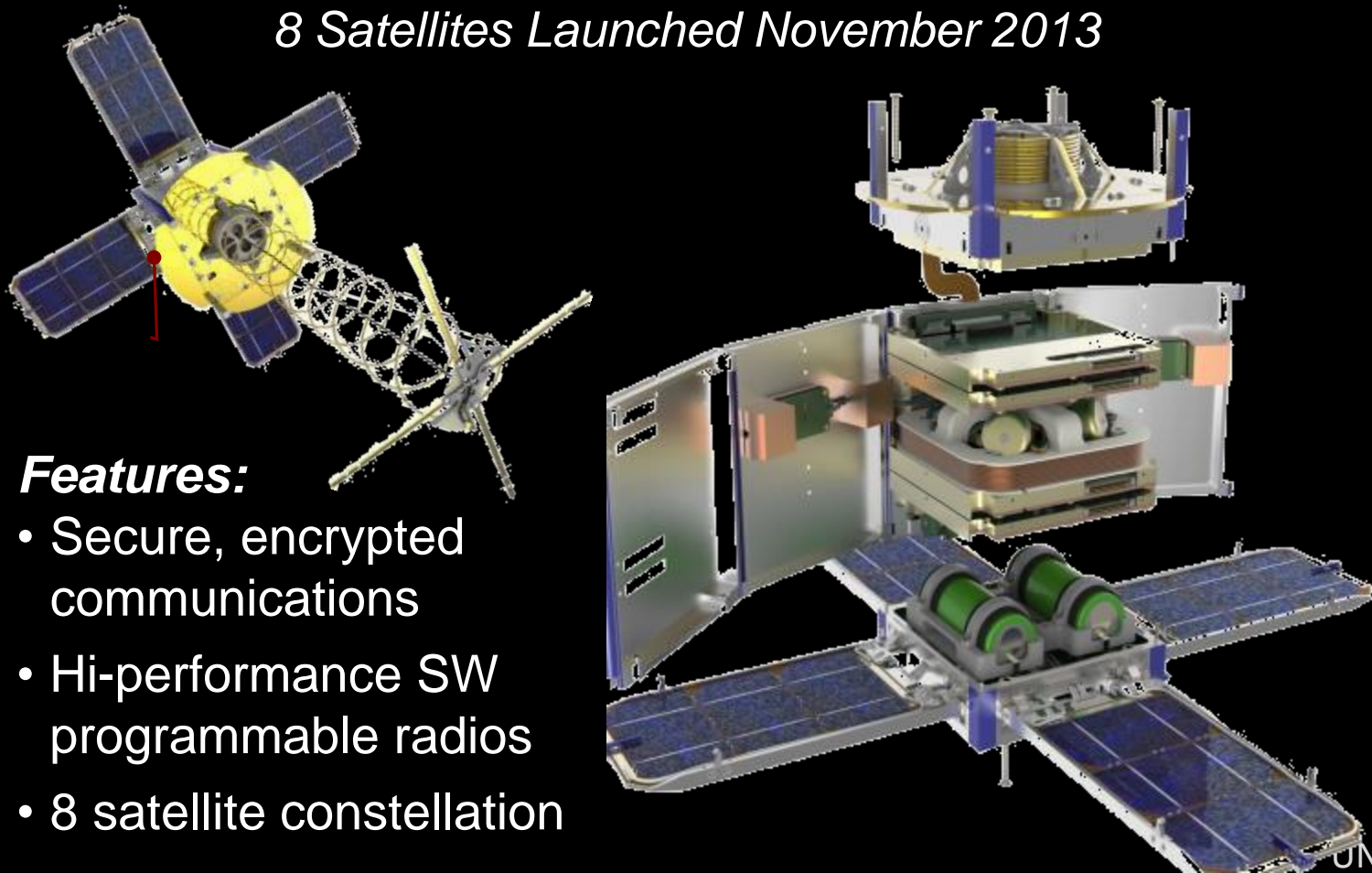
## Prototype System

4 Satellites Launched December 2010



## 2nd Generation System

8 Satellites Launched November 2013



### Features:

- Secure, encrypted communications
- Hi-performance SW programmable radios
- 8 satellite constellation

### Missions:

- C3
- TTL

### Benefits:

- Rapid development time
  - ✓ System is designed to the mission
- Low cost
  - ✓ Leverages COTS technology
  - ✓ Leverages affordable, high performance hardware, tested for space requirements
- Simple to use
  - ✓ User owns/operates/tasks system
  - ✓ Constellation Design
- Foundation for future missions





# Protecting Against the Nuclear Threat



## Los Alamos Supports All National Nuclear Counterproliferation Lines of Operations

- Identification & Prediction
- Monitor & Detection
- Upstream Defeat
- WMD Defeat
- Attribution

## Los Alamos also Supports National Nuclear Non-proliferation Efforts

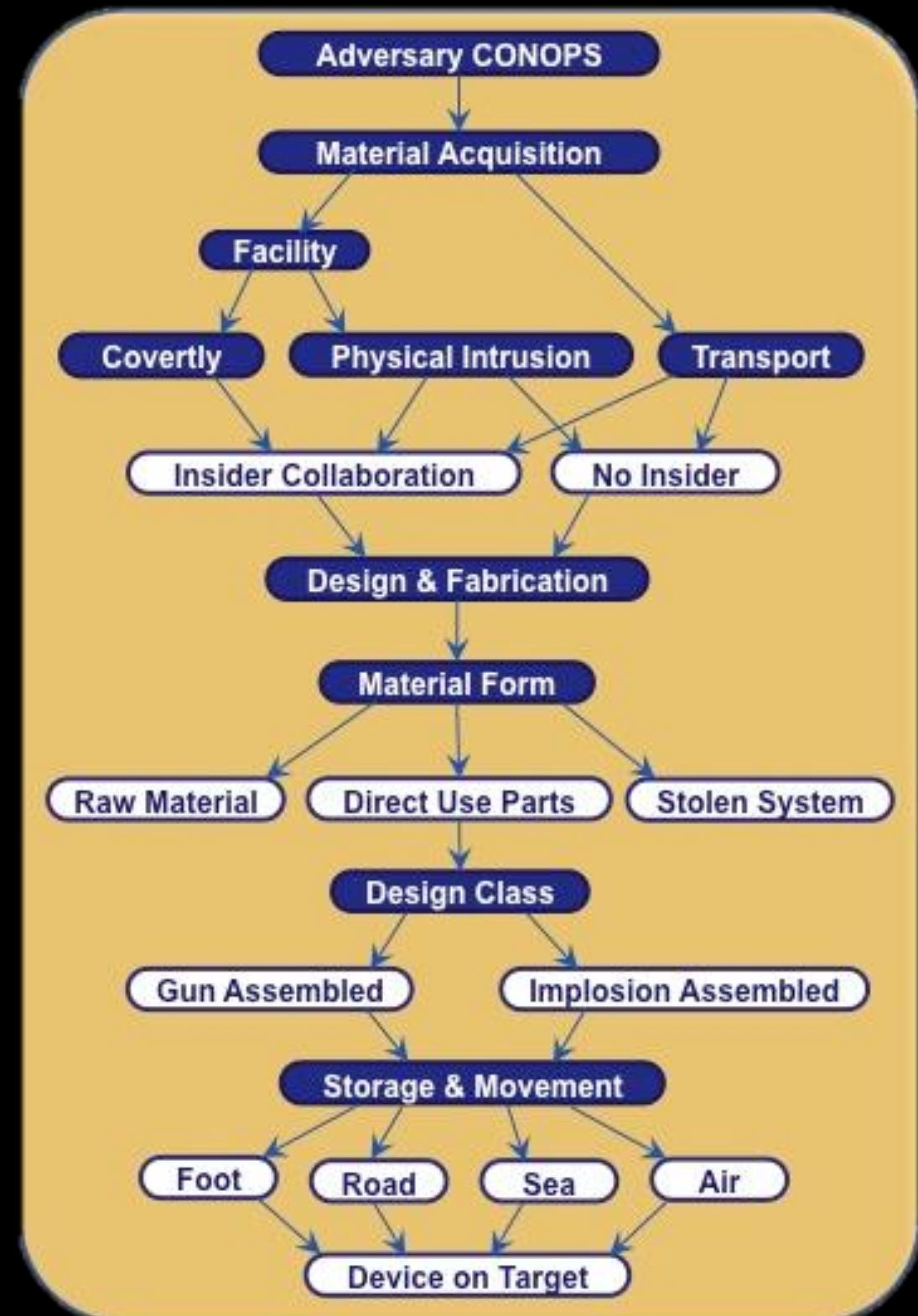


# “Loose Nuke” Project —

## *Applying LANL Expertise to Grand National Security Challenges*

### An internal Los Alamos effort to assess technology effectiveness against the “Loose Nuke” threat

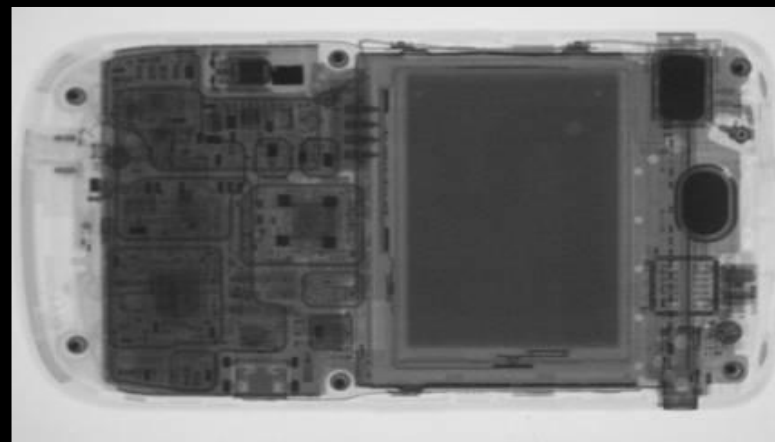
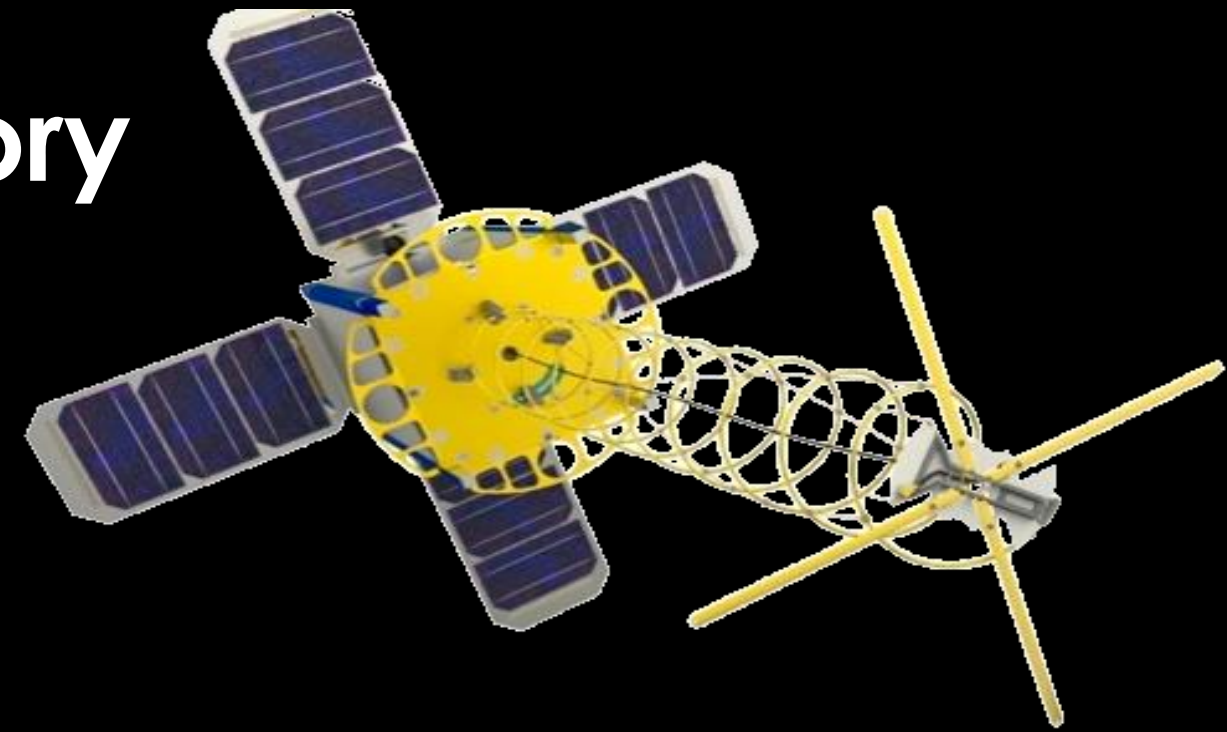
Built an analytical framework that generates the adversary “Loose Nuke” CONOPS space and measures the relative effectiveness of any given technology employed as a loose nuke countermeasure







# Los Alamos – National Security Laboratory



## Science-based Capabilities National Security Applications



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