

# AFRL

## Perspective

# Accelerating the Future Through Particle Accelerators

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# AFRL OVERVIEW



## Global Footprint

Accelerated, game changing S&T to ensure DAF keeps pace with adversaries in force protection, strategic, homeland defense (DOW – DAF Sec Priorities)

**~12,883**

Employees including military, civilians, and contractors

**~\$8.7 Billion**

Annually executed in Research, Development, Test and Engineering funding and funds from other S&T agencies



● AFRL Facilities

**50**

International Countries

**536**

Grants And Agreements

**120**

International Research Agreements



### Contracts

AFRL executes over **7,000** contracts

- ~50% goes through Small Businesses

**Collaborations** include **386** CRADAs and **163** Educational Partnership Agreements

### Major Operating Locations in 14 states:

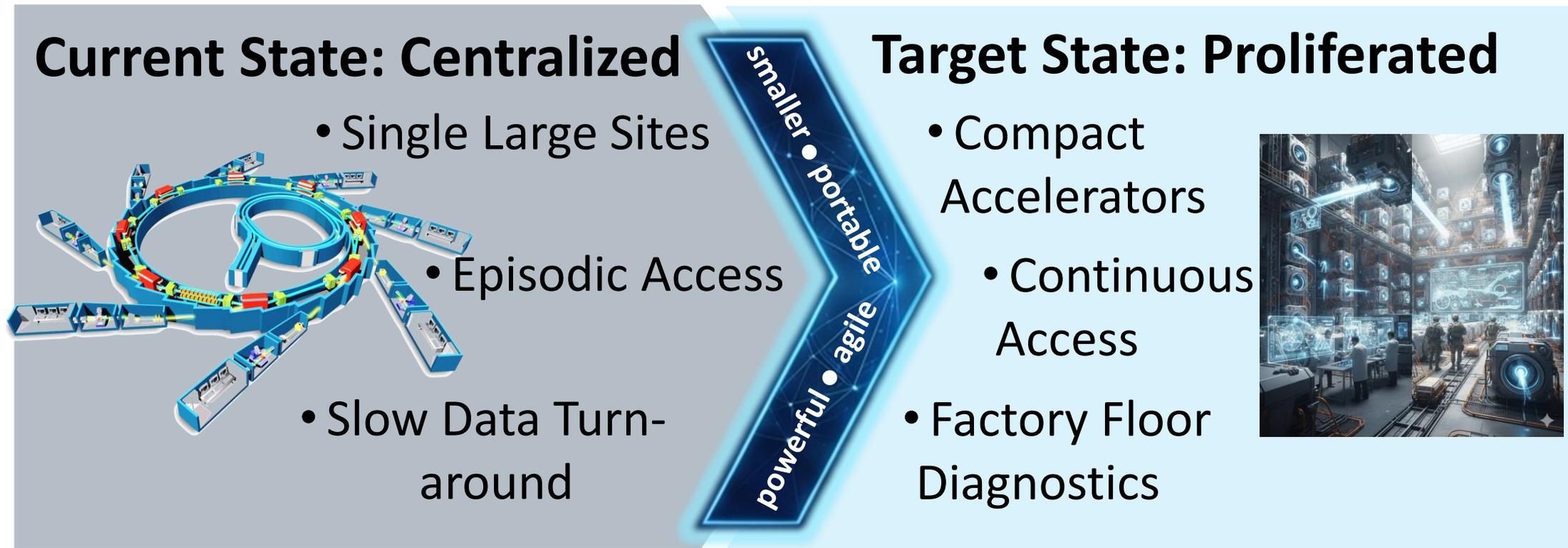
California, District of Columbia, Florida, Hawaii, Maryland, Missouri, Nebraska, Nevada, New Mexico, New York, Ohio, Tennessee, Texas and Virginia



# Accelerated Development to Deployment Transition

Need to move away from reliance on expensive, single-site facilities towards proliferated, accessible capabilities.

- To keep pace with adversarial advancement, we must accelerate development cycles.



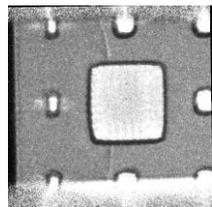
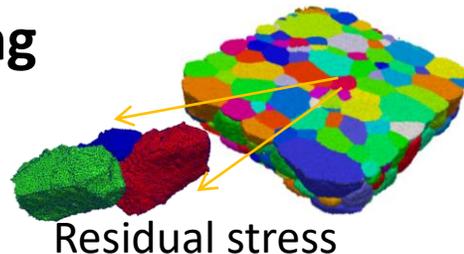
→ Accelerated materials discovery to deployment – Gold-standard data for qualifying models, use in M&M and DE

# Accelerator Mission Impact

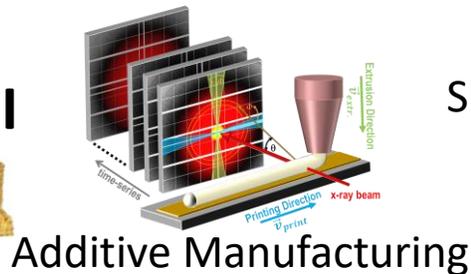
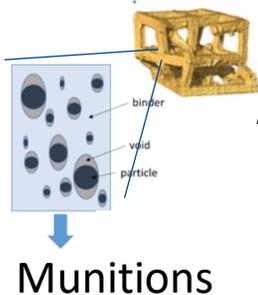
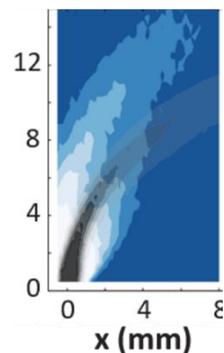
## Materials & Manufacturing

Surge and mass for the fight, low cost/large volume; requires

- New metrology
- Ground truth data for qualifying models
- Inspection tools (70% field issues is M&M source)



## APS, CHESS, NSLS-II



## HP lasers



## Beam Technologies

New threats require new technologies

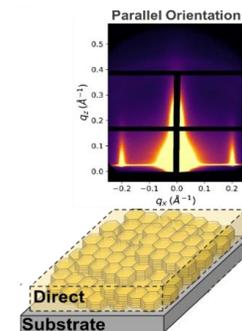
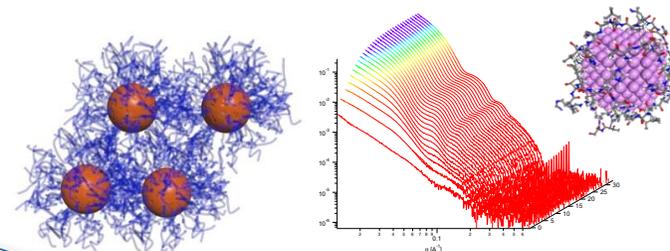
- ISR: see farther, higher speed and throughput
- C2: talk farther, more secure, stealth
- DE: threat of swarms; accelerated, urgent integration (LOCUST – El Paso), cost-effective alternatives to missiles

## Research

Next generation fighting capabilities require new materials and processes. Accelerated materials discovery to deployment.

- General discovery
- Benchmark data/standard on beam-material interactions

## ALS, APS, CHESS, NSLS-II



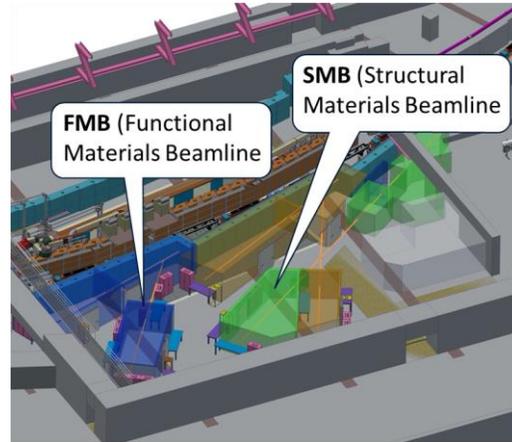


# Innovation Ecosystem – Converging of Tools and Partners

## MOU with NSF to synchronize NSF, AFRL and PIs

Example: CHEX, MSN-C at CHESS

- Demonstrates push to development
- Ecosystem partnerships (academic-industry-lab)
- Tight NSF-AFRL coupling to make it happen
- Cost share
- Bringing use-inspired DAF/DOW problems to challenge and focus the science



Proven Model: MSN-C  
Transforming synchrotron techniques into engineering tools with standards, automation, and mature workflows



Characteristics we strive for any “big bet joint effort”.



# Thank You!

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