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Title:	Oppenheimer Science and Energy Leadership Program(OSELP) Welcome!
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Los Alamos NATIONAL LABORATORY

Oppenheimer Science and Energy Leadership Program (OSELP)

Welcome!

Angela Mielke, Executive Officer for the Deputy Directorate for Science, Technology & Engineering (DDSTE)

Oct. 16, 2023

Agenda: Monday, Oct. 16

Monday, October 16, 2023

7:30	Meet in Buffalo Thunder Hilton Lobby and Depart for LANL	LANL Taxi
8:00	Walk to JRO Study Center; Coffee & Pastries	

J.R. Oppenheimer Study Center, Jemez Cochiti, TA-03-0207-0218

8:15	Welcome and Plan for the Visit	Angela Mielke *Executive Officer for Science, Technology, and Engineering*
8:30	Laboratory Overview and NNSA 101 Mission Context, Capability Pillars, Lab Agenda, & Simultaneous Excellence	Angela Mielke
9:30	LDRD Overview and Strategy	Laura Stonehill *Program Director, Laboratory Directed Research and Development* *OSELP Alumna*
10:00	Break	
10:15	NA-LA Perspective	Ted Wyka *Field Office Manager, Los Alamos Field Office*
10:45	Campus and Infrastructure Strategy	Deb Lewis *Senior Director, Infrastructure Program & Planning Office*
11:30	FLM Engagement and Disciplined Operations	Angela Mielke
12:15	Break	
12:30	Lunch Discussions: Perspective from former Laboratory Director	Sig Hecker
1:30	Walk to Badge Office	
1:35	Badge Office Processing (Otowi)	Sarah Mathis *Protocol*
2:15	Finish Badging; Transit to SM-40	LANL Taxi

SM-40, Quantum Conference Room, TA-03-0040-N101

2:30	Deep Dive & SM-40 Tour (Fuel Cells and Space Programs)	Andrew Dattelbaum *Division Leader, Materials Physics & Applications Division*
3:45	Break; Transit to JRO Study Center	LANL Taxi

J.R. Oppenheimer Study Center, Jemez Cochiti, TA-03-0207-0218

4:00	Director's Perspective	Thom Mason *Laboratory Director*
5:00	Day One Wrap Up/Plan for Day Two	Angela Mielke
5:20	Adjourn; Transit to Bradbury Science Museum	LANL Taxi

Bradbury Science Museum, 1350 Center Ave, Los Alamos NM

5:30	Dinner Reception and Presentation: *The Manhattan Project and The Survival of Los Alamos*	Nic Lewis *Laboratory Historian*
7:30	Return to Buffalo Thunder Hilton	LANL Taxi

Agenda: Tuesday, Oct. 17

7:15	Meet in Buffalo Thunder Hilton; Depart for LANL; Coffee & Breakfast	LANL Taxi
J.R. Oppenheimer Study Center, Jemez Cochiti, TA-03-0207-0218		
8:00	Workforce & University Outreach	Dave Clark *Program Director, National Security Education Center* J. Bradley Beck *Program Director, Workforce, Partnerships & Pipeline Office*
	Diversity Office	Katherine Haight *EEO Diversity Specialist, Human Resources Division Office*
	Technology Transfer at LANL	Mariann Johnston *Deputy Division Leader, Richard P. Feynman Center for Innovation* Candice Siebenthal *Deputy Division Leader, Richard P. Feynman Center for Innovation*
9:00	Mark Peters Engagement with Cohort	
10:00	Break; Transit to Sigma (*FN to stay at Study Center)*	
Sigma, Sheinberg Conference Room TA-03-0066-J105		
10:15	Deep Dive: Materials and Manufacturing	
	Safety & Security Briefing; Sigma Welcome and Overview	Matthew Kerr *Deputy Division Leader, SIGMA-DO*
	Advanced Manufacturing & Facility Tour	John Carpenter *Finishing Manufacturing Science; SIGMA-2*
12:00	Break; Transit to JRO	
12:30	Lunch Discussion: Pit Production Overview (U)	David Dooley *Senior Director, ALDWP Defense Programs Office*
1:30	Break	
1:45	Place-Based Climate and Clean Energy Efforts	George Guthrie *Program Manager, Office of National Security and International Studies* *OSELP Alumnus*

2:45	Break; transit to LANSCE	
LANSCE, Conference Room A234, TA-53-0001-A234		
3:00	LANSCE Overview & Tour (Front End + Isotopes, Accelerator Strategy)	Frank Merrill *Division Leader, Physics Division*
5:00	Wrap Up / Farewell (at LANSCE)	
5:30	Adjourn; Return to Buffalo Thunder Hilton	LANL Taxi

Los Alamos NATIONAL LABORATORY

Oppenheimer Science and Energy Leadership Program (OSELP)

Lab Overview and NNSA 101

Angela Mielke, DDSTE Executive Officer

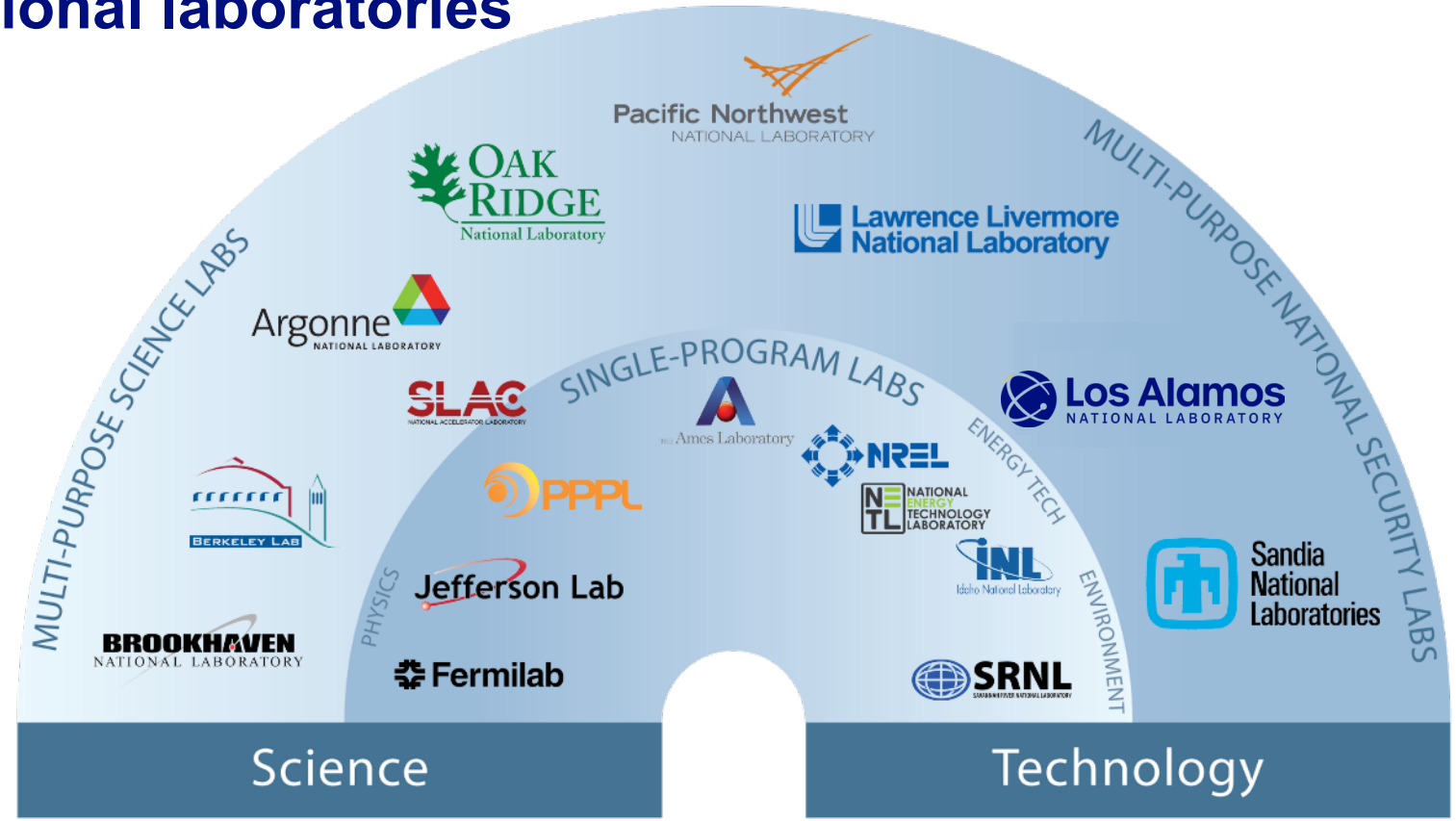
Los Alamos delivers national security solutions

- **We are dedicated to addressing complex national security issues and the world's most difficult challenges**
  - By applying multidisciplinary science, technology & engineering capabilities;
  - In unique experimental, computational, and nuclear facilities;
  - With an agile, responsive, and innovative workforce;
  - And by partnering with peer institutions for mission success

LANL Statistics

$4.4B budget
40 square miles, 47 technical areas
727 bldgs., 7.6M sq ft.
13 nuclear facilities
17,000 + workers
12,000 career employees
1,812 students, 468 postdocs
Employee average age: 42
67% male; 33% female 49% minorities
40.2% of employees are native New Mexicans

Los Alamos is one of 17 Department of Energy national laboratories



LANL is a key part of the U.S. nuclear security enterprise

National laboratories and test sites

Los Alamos National Laboratory*

Lawrence Livermore National Laboratory

Nevada National Security Site

Sandia National Laboratories*

Production complexes

Kansas City National Security Campus

Pantex Plant

Savannah River Site

Y-12 National Security Complex

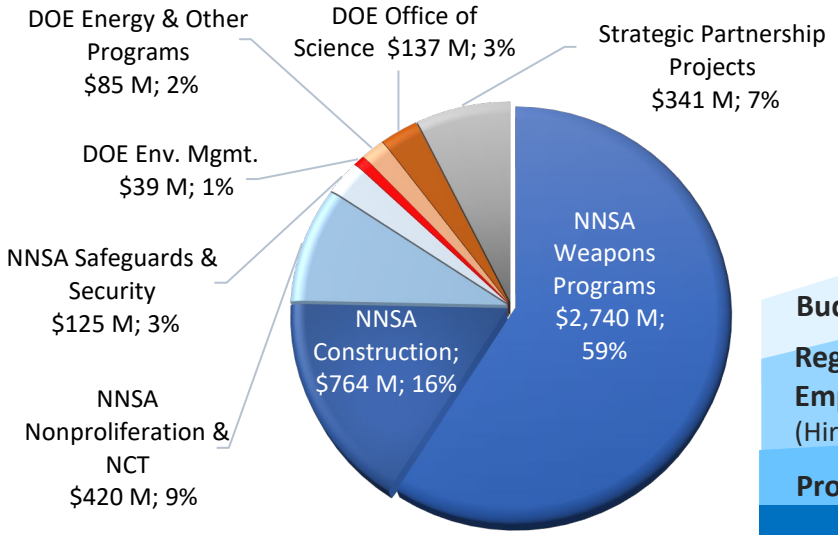
*Also production facilities

Significant increase in funding has driven hiring and procurement to record highs

We have added capacity and are focused on increasing efficiency

- We're working to simplify processes and exploring off-site campus to address space needs

FY23 LANL Programmatic Portfolio $4.6B



	FY19	FY20	FY21	FY22	FY23 est.
Budget	$2.9B	$3.2B	$4B	$4.03B	$4.6B
Regular/Term Employees (Hires/Attrition)	8,835 (1,250 / 746)	9,410 (1,152 / 571)	9,931 (1,277 / 756)	10,853 (2,077 / 1,065)	~12,300* (2,439 / 842)
Procurement	$0.773B	$1.096B	$1.4B	$2B	>$2.13B

Total FY23 workforce: ~17,500

Los Alamos NATIONAL LABORATORY

Our demographics compare favorably to other Labs

	Total No. (LANL)	Women (LANL) Number / %		Women (All Labs, %)	URM (LANL) Number / %		URM (All Labs, %)
Senior Leadership	66	21	**31.8%**	**36.4%**	8	**12.1%**	**12.0%**
Research/Technical Management (first-line and mid-level)	430	107	**24.8%**	**19.8%**	78	**18.1%**	**12.3%**
Operations (or Research Support) Management	945	308	32.5%	35.0%	414	43.8%	18.0%
Technical Research Staff	3696	997	**26.9%**	**20.5%**	751	**20.3%**	**13.0%**
Operations Support Professionals	4745	2217	46.7%	43.9%	2439	51.4%	32.0%
Postdoctoral	475	119	**25.1%**	**27.5%**	52	**10.9%**	**8.5%**
Technicians	2072	451	21.7%	20.5%	1131	54.6%	13.0%
Administrative Support	286	259	90.6%		227	79.4%	
Craft and Union	1502	80	5.3%		1196	79.6%	
Graduate Students	661	221	**33.4%**	**32.9%**	153	**23.1%**	**18.9%**
Undergraduate Students	839	361	**43.0%**	**39.3%**	354	**41.1%**	**29.4%**
TOTALS	**15920**	**5232**	**32.9%**	**31.1%**	**6803**	**42.7%**	**20.4%**

Data as of October 2023: Includes Laboratory recruited roles (includes roles waived from posting), Post-doc employees, and students funded by the Lab (not DOE funded students)

URM": Under-represented minorities (e.g., African American/Black, Hispanic/Latino, and American Indian/Alaskan Native

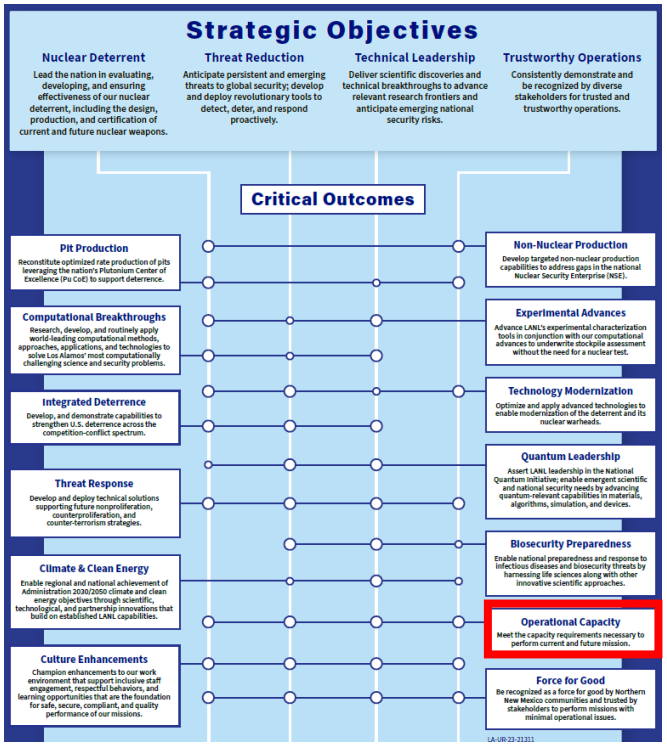
We are focused on achieving representative demographics AND an inclusive culture

	Women			URM			OPC			Protected Veterans			IWD		
	2020	2021	2022	2020	2021	2022	2020	2021	2022	2020	2021	2022	2020	2021	2022
Executive Managers	28.6%	26.8%	28.6%	10.2%	10.7%	6.3%	0.0%	0.0%	0.0%	14.0%	8.9%	3.2%	12.0%	10.7%	6.3%
Technical Managers	23.7%	24.3%	23.2%	12.3%	15.3%	17.3%	5.8%	4.7%	3.9%	5.2%	4.0%	4.4%	2.7%	4.7%	2.6%
Operations Support Managers	29.7%	34.5%	33.5%	39.7%	42.7%	44.9%	1.1%	1.2%	1.2%	16.5%	13.5%	13.3%	8.1%	7.8%	5.5%
Technical Research Staff	23.3%	24.5%	25.6%	15.6%	17.6%	19.9%	7.9%	7.9%	7.8%	4.2%	3.4%	3.5%	2.6%	2.5%	3.6%
Operations Support Staff	42.3%	41.0%	41.5%	52.8%	54.0%	55.3%	2.1%	1.9%	2.1%	7.9%	6.7%	6.4%	5.8%	6.2%	6.0%
Post Docs	24.9%	27.2%	27.0%	6.8%	8.9%	9.0%	36.8%	33.5%	36.0%	0.4%	0.6%	0.5%	4.7%	6.3%	6.6%
Graduate Students	37.3%	36.7%	34.1%	24.4%	29.6%	26.2%	14.8%	12.5%	16.0%	0.5%	0.5%	0.3%	4.3%	6.0%	5.7%
Undergraduate Students	45.0%	45.6%	41.0%	43.6%	45.3%	42.4%	6.7%	6.3%	7.9%	0.4%	0.4%	0.6%	3.2%	4.3%	6.3%
Total numbers	**3933**	**4143**	**4515**	**4066**	**4595**	**6123**	**657**	**650**	**728**	**676**	**616**	**673**	**525**	**612**	**680**

Data as of Oct. 1 of each year

URM: Underrepresented Minorities (African Americans, Hispanics, Native Americans, Two or More Races)
OPC: Other People of Color (Asians and Pacific Islanders)
IWD: Individuals With Disabilities

Operational Capacity Critical Outcome: Initiatives



1. Implement **talent acquisition** plans, tools, practices, and **career development** opportunities to meet requirements of the Laboratory missions.
2. Improve the fidelity of **procurement planning** and increase **procurement volume** in support of Lab spending plans, leveraging new tools such as Ariba and Master Agreement Task Order Contracts (MATOCs), and Construction Manager/General Contractor (CM/GC) project delivery method, and using both forward-looking input and existing data from previous procurement cycles. Assure procurements are executed efficiently and support missions and community-centered/small business targets to the extent possible.
3. Ensure **construction capacity** to meet construction growth by leveraging tools such as MATOCs to decrease self-perform work and to support entire site's plans as identified in the critical outcomes.
4. Meet increased demand for **space** including office space and lab space for critical outcomes and to support growth in mission and support activities.
5. Complete and present a **comprehensive transportation study** and develop/execute a plan that enables mission, optimizes commute times, incentivizes user adoption of mass transit as the preferred option, leverages regional partnerships for off-hill parking/bussing, and supports net-zero goals.
6. Develop and execute a comprehensive **facility-based five-year plan for major maintenance** to improve the overall reliability and mission readiness of the LANL facility portfolio.
7. Improve and measure **critical mission process efficiencies** through innovations in process design and implementation, increased use of automation and workflow tools, better training with end users in the loop, consistent with the integrated System of Management Systems (iSoMS) online tool framework for improvement.
8. Develop an IT RoadMap to improve and prioritize IT infrastructure investments and communications tools, including wireless in PF-4, red net capacity in new and existing Laboratory facilities, and other capabilities to ensure modern collaboration tools.
9. Continue to develop the **campus master plan** (CMP) and the CMP White Board application to fully integrate facility/infrastructure requirements with mission drivers, environmental opportunities and constraints, and security requirements.
10. Deliver operational tools, processes, and management systems that are streamlined to provide effective and efficient mission execution.
11. Deploy innovative and strategic approaches to **permitting strategy and implementation** to enable mission delivery.

Leadership team continues to evolve

Laboratory Director
Thomas Mason

Staff Director
Frances Chadwick

Deputy Director
Science, Technology & Engineering
Mark Chadwick (interim)

- **ALD, Global Security** — Nancy Jo Nicholas
- **ALD, Chemical, Earth & Life Sciences** — J. Patrick Fitch
- **ALD, Physical Sciences** — Ellen Cerreta
- **ALD, Simulation & Computation** — Andy Wolfsberg (acting)

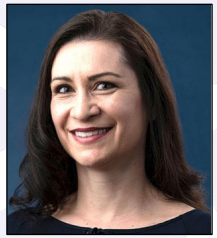
Deputy Director
Weapons
Robert Webster

- **ALD, Weapons Physics** — Charlie Nakhleh
- **ALD, Weapons Engineering** — James Owen
- **ALD, Weapons Production** — John Benner
- **ALD, Plutonium Infrastructure** — Mark Anthony

Deputy Director
Operations
Kelly Beierschmitt

- **ALD, Defense Protection Program** — Unica Viramontes
- **ALD, ESHQ** — Steve Coleman
- **ALD, Infrastructure & Capital Projects** — Dave Teter
- **ALD, Business Management** — LeAnne Stribley
- **ALD, Facilities & Operations** — Bret Simpkins

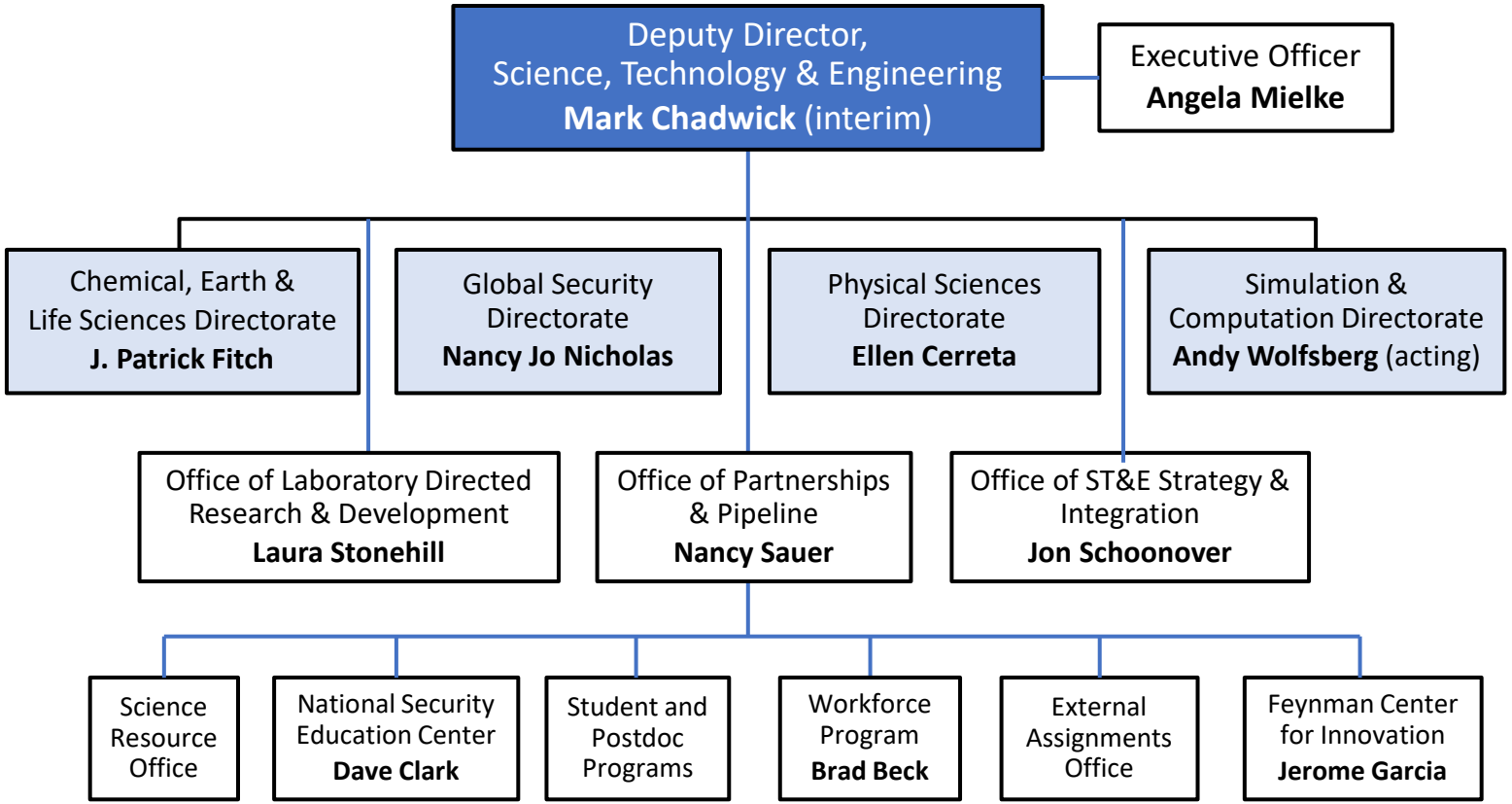
Human Resources
Laurie Monfiletto


Unica Viramontes


Ellen Cerreta


Steve Coleman

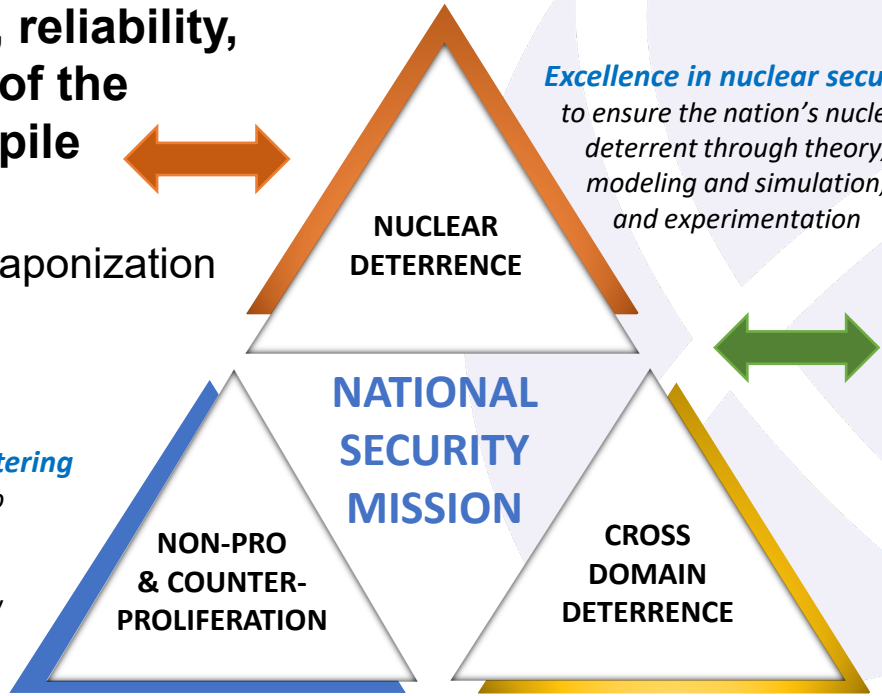
DDSTE stewards institutional capabilities for the Laboratory



Our national security mission is broad and important
— and motivates and is enabled by ST&E discoveries

Ensure the safety, reliability, and performance of the U.S nuclear stockpile

- Physics & Design
- Engineering & Weaponization
- Production



Excellence in nuclear security *to ensure the nation's nuclear deterrent through theory, modeling and simulation, and experimentation*

Preventing and countering *efforts of proliferants to acquire, develop or disseminate materials and expertise necessary for nuclear weapons*

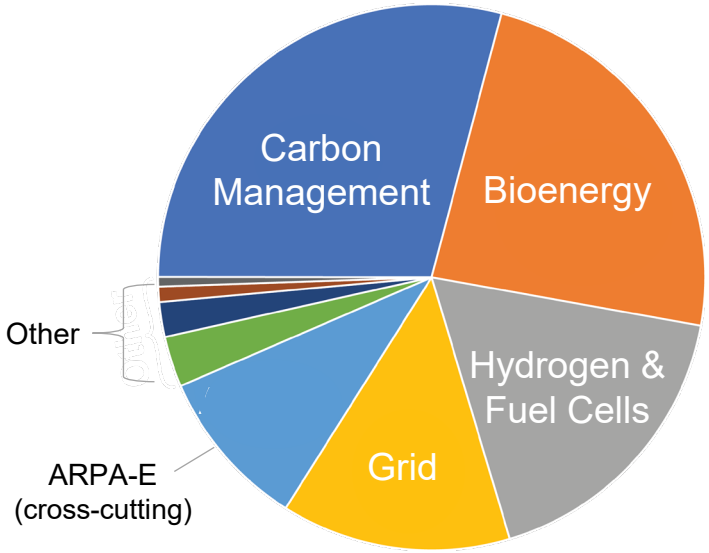
Energy security

- Sustainable Nuclear Energy
- Resilient Materials
- Complexity in Energy Systems

Supporting *the DoD, IC, and other national security partners to execute multidomain operations across land, air, sea, space, and cyber*

Building on 40 years of R&D in key areas of energy, Los Alamos is ready to accelerate deployment

Our applied energy portfolio is dominated by 4 key areas



~$35M/year

Technology Deployment

National energy targets

FACT SHEET: President Biden Sets 2030 Greenhouse Gas Pollution Reduction Target Aimed at Creating Good-Paying Union Jobs and Securing U.S. Leadership on Clean Energy Technologies

On Day One, President Biden fulfilled his promise to rejoin the Paris Agreement and set a course for the United States to tackle the climate crisis at home and abroad, reaching net zero emissions economy-wide by no later than 2050. As part of re-entering the Paris Agreement, he

Our Lab Agenda emphasizes Simultaneous Excellence

How **we do our work is as important as *what* we do**

Strategic Objectives

- **Nuclear Deterrent**
- **Threat Reduction**
- **Technical Leadership**
- **Trustworthy Operations**

Critical Outcomes

- Pit Production
- Non-Nuclear Production
- Computational Breakthroughs
- Experimental Advances
- Integrated Deterrence
- Technology Modernization
- Threat Response
- Quantum Leadership
- Climate & Clean Energy
- Biosecurity Preparedness
- Culture Enhancements
- Operational Capacity
- Force for Good

Strategic objectives are achieved through critical outcomes

Strategic Objectives

Nuclear Deterrent: Lead the nation in evaluating, developing, and ensuring effectiveness of our nuclear deterrent, including the design, production, and certification of current and future nuclear weapons.	**Threat Reduction:** Anticipate persistent and emerging threats to global security; develop and deploy revolutionary tools to detect, deter, and respond proactively.	**Technical Leadership:** Deliver scientific discoveries and technical breakthroughs to advance relevant research frontiers and anticipate emerging national security risks.	**Trustworthy Operations:** Consistently demonstrate and be recognized by diverse stakeholders for trusted and trustworthy operations.

Critical Outcomes

Pit Production	Reconstitute optimized rate production of pits leveraging the nation's Plutonium Center of Excellence (Pu CoE) to support deterrence.
Non-Nuclear Production	Develop targeted non-nuclear production capabilities to address gaps in the national Nuclear Security Enterprise (NSE).
Computational Breakthroughs	Research, develop, and routinely apply world-leading computational methods, approaches, applications, and technologies to solve Los Alamos' most computationally challenging science and security problems.
Experimental Advances	Advance LANL's experimental characterization tools in conjunction with our computational advances to underwrite stockpile assessment without the need for a nuclear test.
Integrated Deterrence	Develop and demonstrate capabilities to strengthen U.S. deterrence across the competition-conflict spectrum.
Technology Modernization	Optimize and apply advanced technologies to enable modernization of the deterrent and its nuclear warheads.
Threat Response	Develop and deploy technical solutions supporting future nonproliferation, counterproliferation, and counter-terrorism strategies.

Quantum Leadership	Assert LANL leadership in the National Quantum Initiative; enable emergent scientific and national security needs by advancing quantum-relevant capabilities in materials, algorithms, simulation, and devices.
Climate and Clean Energy	Enable regional and national achievement of 2030/2050 climate and clean energy objectives through scientific, technological, and partnership innovations that build on established LANL capabilities.
Biosecurity Preparedness	Enable national preparedness and response to infectious diseases and biosecurity threats by harnessing life sciences along with other innovative scientific approaches.
Culture Enhancements	Champion enhancements to our work environment that support inclusive staff engagement, respectful behaviors, and learning opportunities that are the foundation for safe, secure, compliant, and quality performance of our missions.
Operational Capacity	Meet the capacity requirements necessary to perform current and future mission.
Force for Good	Be recognized as a force for good by No. NM communities and trusted by stakeholders to perform missions with minimal operational issues.

HOW we do our work is as important as WHAT we do

- **Safety Culture**
  - 8 Safe Conduct of Research (SCoR) principles
  - SCOR applies equally to Security & Environmental Compliance
  - “Culture Alliance” is reiterating the fundamentals:
    - Leadership Expectations
    - Workforce Engagement
    - Organizational Learning
- **Commitment to diversity, inclusion, and belonging**

“Diversity is a fact, inclusion is a behavior, but belonging is the emotional outcome that people want in their organization.”

– Christianne Garofalo, Heidrick & Struggles

1. Everyone is personally responsible for ensuring safe operations.
2. Leaders value the safety legacy they create in their discipline.
3. Staff raise safety concerns because trust permeates the organization.
4. Cutting-edge science requires cutting-edge safety.
5. A questioning attitude is cultivated.
6. Learning never stops.
7. Hazards are identified and evaluated for every task, every time.
8. A healthy respect is maintained for what can go wrong.

Technical Leadership

Deliver scientific discoveries and technical breakthroughs to advance relevant research frontiers and anticipate emerging national security risks

Long-term ST&E stewardship is based on Capability Pillars

- Our capability pillars define six key areas of science, technology, and engineering in which we must lead

ENGINEERING	MATERIALS FOR THE FUTURE	Defects and Interfaces Extreme Environments Emergent Phenomena
	NUCLEAR AND PARTICLE FUTURES	Accelerator Science, Eng. & Technology Applied Nuclear Science & Engineering High Energy Density Plasmas & Fluids Nuclear, Particle, Astrophysics & Cosmology
	INTEGRATING INFORMATION, SCIENCE, AND TECHNOLOGY FOR PREDICTION	Computing Platforms Computational Methods Data Science
	SCIENCE OF SIGNATURES	Nuclear Detonation Nuclear Processing, Movement, Weaponization Natural and Anthropogenic Phenomena
	COMPLEX NATURAL AND ENGINEERED SYSTEMS	Human–Natural System Interactions: Nuclear Engineered Systems Human–Natural System Interactions: Non-Nuclear
	WEAPONS SYSTEMS	Design Manufacturing Analysis

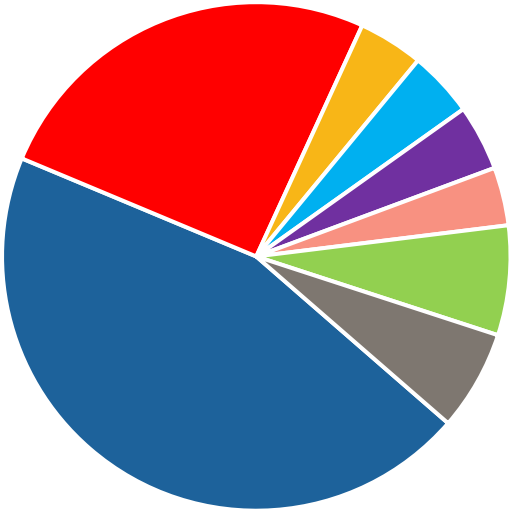
LDRD supports technical vitality, mission agility, and workforce development

Exploratory Research
26%
Innovate at the frontiers of technical disciplines

Directed Research
45%
Create multidisciplinary solutions to complex problems defined by Lab strategy

Reserve (unencumbered)
6%

Director's Initiatives
7%
Invest in the Lab Agenda with the rigor and creativity of LDRD



Baseline LDRD Program
FY23 Budget: $215M
[FY22 was $180M]

Early Career Research
4%
Develop next-generation technical leaders

Postdoctoral R&D
4%
Attract and recruit top-quality talent into the Lab's pipeline

Mission Foundations
4%
Translate discovery into novel mission solutions

Centers Research
4%
Incubate emerging ideas and talent in areas defined by the Lab's Strategic Centers

Partnerships & Pipeline Office (PPO) enhances our internal coordination and external outreach

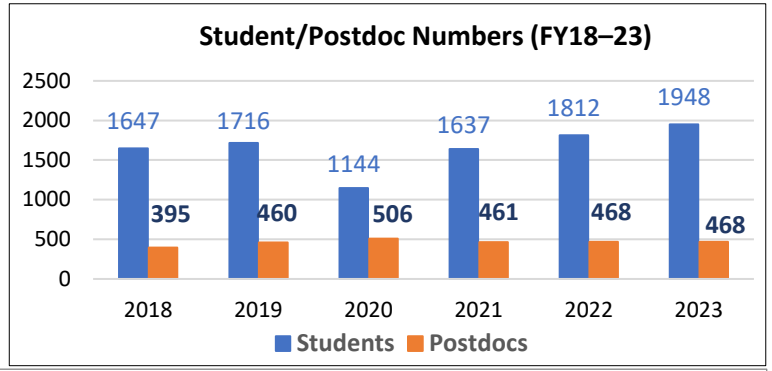
- **Student Programs:** Education opportunities for high school, undergraduate, and graduate students
- **Postdoctoral Programs:** Postdocs contribute to research efforts, enhance our science, technology, and engineering capabilities

- **National Security Education Center Strategic Centers:** Scientific centers of excellence with high international visibility that innovate strategic new science and education programs
- **New Mexico Consortium Coordination:** Creative mechanisms for collaboration with NM research universities through joint appointments and unique facilities
- **Feynman Center for Innovation:** From “tech transfer”’ to innovation asset stewardship, with strategy driven through Innovation Asset Strategic Council

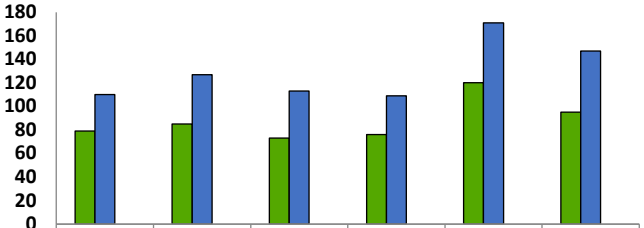
Student and Postdoc pipelines are essential

- 2023 Student Program had 1,948 student interns and guests at peak in July
  - Up 7.5% from 2022
- Summer schools are a unique pipeline to recruit students in key technical areas
- Rigorous postdoc conversion process leads to talented early career staff with key mission skills
- Student programs, pipeline initiatives boost diversity in student pipeline
  - See e.g., women.lanl.jobs

31.7% of regular/term employees have at least one degree from a NM college or university



Postdoc Conversions compared to total non-management technical hires (FY18-FY23)



	FY18	FY19	FY20	FY21	FY22	FY23
Postdoc Conversions to Scientist and R &D Engineer	79	85	73	76	120	95
Total PhD Non-Management Scientist and R&D Engineer, Levels 1-3 plus PhD GRA & Postdoc Conversions	110	127	113	109	171	147
% of Postdoc Conversions to Total PhD Staff Hires	72%	67%	65%	70%	70%	65%

Los Alamos delivers national security solutions

- **We are dedicated to addressing complex national security issues and the world's most difficult challenges**
  - By applying multidisciplinary science, technology, and engineering capabilities
  - In unique experimental, computational, and nuclear facilities
  - With an agile, responsive, and innovative workforce
  - And by partnering with peer institutions for mission success




Backup slides

Los Alamos is working with DOE & other partners to pioneer a new, place-based initiative on energy transitions

Intermountain West Energy and Sustainability Transition (I-WEST)

A Place-based Approach to Achieving Carbon Neutrality in the Intermountain West

- **Two Primary Goals (for Phase I)**
  - Develop a stakeholder-based roadmap to achieve carbon neutrality by 2035
  - Build regional coalitions to deploy the roadmap
- **Place-Based Approach**
  - Prioritize regional attributes and societal readiness first, and technologies second
- **Multiple Technologies and Economies**
  - Carbon capture, storage, and utilization; clean hydrogen, bioenergy, and electricity
  - Cross-cutting solutions from all DOE energy programs to ensure sustainability in an evolving climate

I-WEST

www.iwest.org

Modern stockpile stewardship differs radically from last-century stewardship

- **LANL is the design laboratory for 4 of the 7 weapons systems in the nation's on-alert deterrent**
- Stewardship today involves testing facilities, surveillance, simulation and supercomputing, and nuclear material facilities
- Multidisciplinary science and engineering underpin all LANL programs, as experiments enrich our nation's confidence in the stockpile
- LANL collaborates exclusively with DOE labs and industry to perform R&D for federal sponsors

U.S. testing site craters and the Trinity supercomputer

LANL is modernizing three weapon systems and beginning development of the first new system since the Cold War

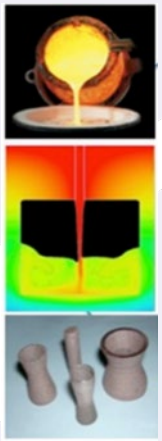
- The **W76-1 and W76-2 Life Extension Programs** are complete, refreshing the backbone of the US deterrent
- The **W88 ALT 370, high explosive refresh, and ALT 940** will modernize the balance of the seaborne deterrent
- The **B61-12 LEP** will consolidate four B61 weapons into a modernized, sustainable system with enhanced accuracy
- The **new W93 program** will deliver the next-generation of sea-launched warhead to meet evolving military needs

Significant experimental effort

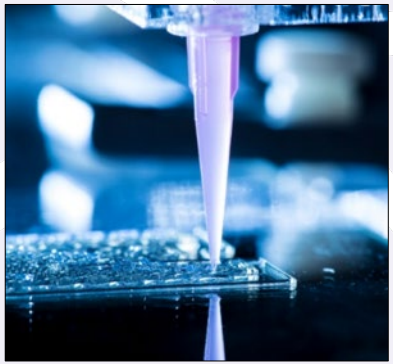
Significant R&D effort

LANL is also responsible for the production of essential weapon components

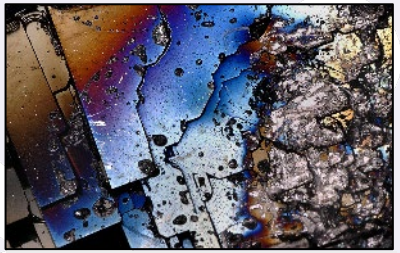
- LANL serves as the **production agency** for:
  - Detonators, Power supplies, Pits
- We serve as **technical reachback** for
  - High explosives, Cases, Gas systems
- Our **enhanced pit production mission** (from boutique R&D capability to sustained 30 pits per year) is a major focus of the entire Laboratory
- LANL is the **NNSA Center of Excellence for Plutonium**:
  - NASA radiothermal generator production
  - Plutonium science and metallurgy
  - Americium production for the Office of Science



Casting



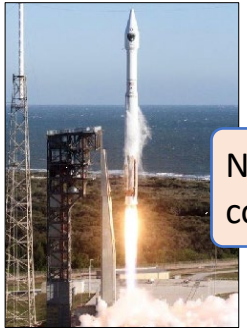
Additive Manufacturing

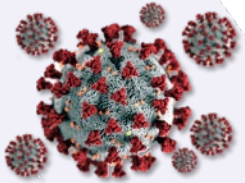


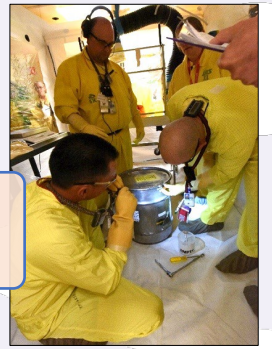
Actinide Science

Our Global Security portfolio is responsive to national needs and answers “Why LANL?”

- “It takes a weapons lab to find a weapons lab”
- The Laboratory as a testbed: experimentally validated intelligence





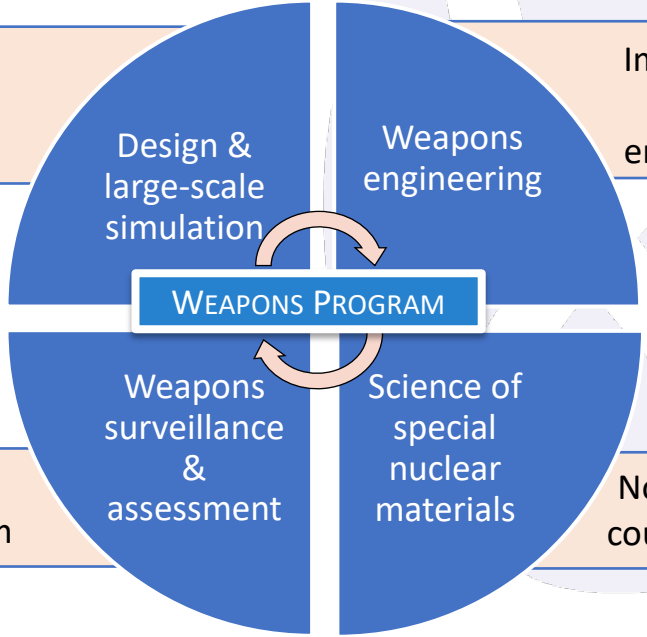


Foreign weapons & program assessments

Improvised nuclear devices & nuclear emergency response

Nuclear counterterrorism

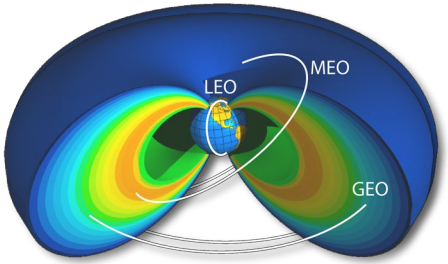
Nonproliferation & counterproliferation



GLOBAL SECURITY PROGRAMS

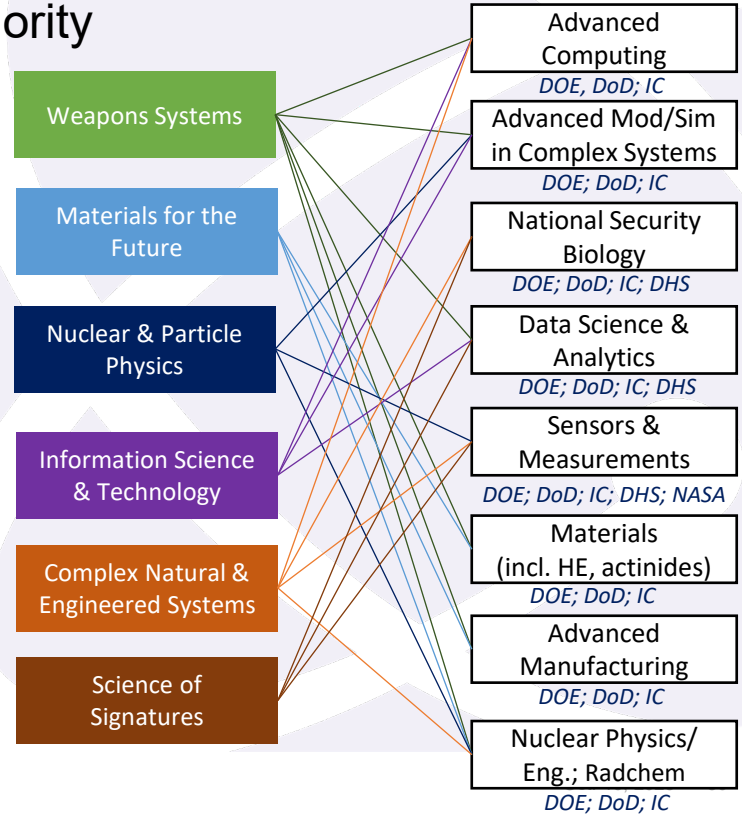
Our non-NNSA portfolio spans diverse programmatic partners and is consistent with our core capabilities

- LANL contributes to key mission drivers and priority objectives for DOE and other USG sponsors
  - Space and biological science are two areas with strong representation in SPP Projects



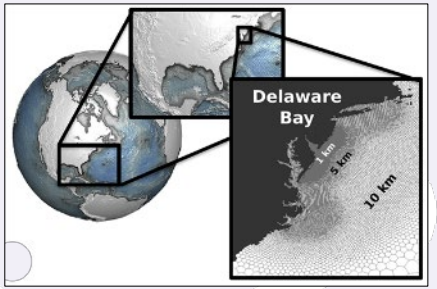
LANL capabilities address new and evolving threats in space situational awareness and space protection

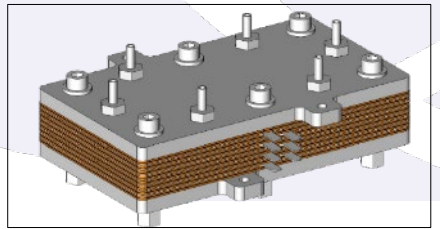
LANL leverages its capabilities in biotechnology, bioinformatics, and life sciences



Los Alamos has a history of research in climate science, clean energy, and decarbonization

- Interface of energy, climate, environment, human health, and national security
  - Energy security
  - Climate resilience
- From basic to applied
- From planet to region to networks to new sustainable materials & devices



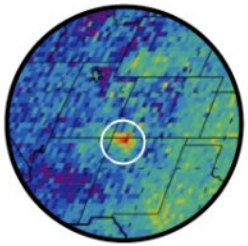


E3SM

Los Alamos translational work in climate science has civilian and national security foci

- Predictions for coastal resiliency
- Emergency infrastructure response to extreme weather
- Detection and attribution of climate manipulation
- Permafrost vulnerability, sea level rise
- Impacts of climate, extreme weather, fire, regional forest mortality on water resources
- Disease forecasting using satellite imagery, clinical surveillance data, climatological data, demographic data, and Google search queries


Coastal Resilience


Geoengineering


The New Arctic


Nuclear Env.


Regional Stability

Nuclear energy efforts span Office of Nuclear Energy and beyond…

- Current strong support for the next generation of reactors, including robust microreactors, compact space systems, small modular, and advanced molten salt, gas-cooled, etc.
- Partnership is multi-agency (not just civilian)
  - DoD, NASA, industry, DOE joint interagency agreements, with NNSA engagement
- Growth of nuclear energy is true under a range of futures:



NASA

INL Idaho National Laboratory

NNSA National Nuclear Security Administration

DARPA DEFENSE ADVANCED RESEARCH PROJECTS AGENCY

Our goal is to maintain LANL as a key partner in synergistic R&D: reactor design and safeguards, nuclear data and modeling/simulation, advanced ceramic fuels, and sub-scale proof-of-principle nuclear experiments.