



Sandia-NMT FY24 Informational Meeting

NMT Team:

Ron Baker (Campus Executive)

Adele Doser (Campus Partnership Manager)

Josh Martinez (Technical Business Dev.
Specialist)

Angela Meyer (Admin Support)



NATIONAL SECURITY IS OUR BUSINESS

For more than 70 years, Sandia has delivered essential science and technology to address the nation's most challenging security issues



PURPOSE

Render exceptional service in the national interest

VISION

On behalf of our nation, we anticipate and solve the most challenging problems that threaten security in the 21st century

MISSION

Our unique mission responsibilities in nuclear weapons create a foundation from which we leverage capabilities, enabling us to solve complex national security problems





SANDIA HAS FIVE MAJOR PROGRAM PORTFOLIOS

NUCLEAR DETERRENCE

Supports Sandia's primary mission to ensure that the **U.S. nuclear arsenal is safe, secure, and reliable** and can fully support our nation's nuclear deterrence policy.

GLOBAL SECURITY

Develops and implements innovative engineering solutions to **anticipate and counter the emergence, proliferation, and use of weapons of mass destruction**.

NATIONAL SECURITY PROGRAMS

Provides systems, science, technology, and expertise in support of **national security objectives**.

ENERGY & HOMELAND SECURITY

Secures the nation's critical **infrastructures and the environment** against attacks, threats, and climate change by performing world-class research and development.

ADVANCED SCIENCE & TECHNOLOGY

Delivers **use-inspired basic research that combines foundational science and science-based engineering** to solve the nation's greatest security challenges today and in the future.



Laboratory-Directed Research & Development (LDRD)

LDRD is one of the primary ways research collaborations are seeded between Sandia and university partners

Research Foundations

Conduct fundamental discovery research essential to national security mission needs

- Bioscience
- Computing & Information Sciences
- Earth Science
- Engineering Science
- Materials Science
- Nanodevices & Microsystems
- Radiation, Electrical & High Energy Density Science



Mission Foundations

Conduct applied research in areas directly relevant to current and anticipated missions

- Advanced Science & Technology
- Energy & Homeland Security
- Global Security
- National Security Programs
- Nuclear Deterrence

Strategic Initiatives

Promote strategic collaborations and Labs-directed initiatives

- Academic Partnerships
- Exploratory Express
- Grand Challenges
- Mission Campaigns
- New Ideas



MISSION CAMPAIGNS AND GRAND CHALLENGES

These two Strategic Initiatives provide strong avenues to impact

Mission Campaigns provide an **agile**, intentional process to **bridge science, technology & engineering R&D** to **mission application impact**. They are integrated, multi-disciplinary portfolios of LDRD-funded projects focused on **addressing current and future national security needs**. (up to \$40M over 5-7 years)



MISSION CAMPAIGNS

Autonomy for Hypersonics (A4H)
(FY18-FY24)

Resilient Agile Deterrence (RAD)
(FY18-FY24)

Science and Technology Advancing Resilience for Contested Space (STARCS)
(FY20-FY26)

Assured Survivability and Agility with Pulsed Power (ASAP)
(FY21-FY26)

Resilient Energy Systems (RES)
(FY21-FY27)

Grand Challenges represent Sandia's largest investment in a single discretionary R&D project. They seek the **boldest national security-relevant** outcomes, create **enduring** cross-disciplinary teams, and generate **differentiating strategic capabilities**. (up to \$5M/year for up to 3 years)



GRAND CHALLENGES

Computational Approaches for Predicting Shared Interactions of Infectious Diseases (CAPSIID)
(FY24-FY26)

Climate Impact, Dynamically Trace Attribution (CLDERA)
(FY21-FY24)

Beyond Fingerprinting
(FY21-FY24)

Thermal Protection System (TPS) Materials
(FY22-FY25)

Radiation-hardened Edge Processing Systems (RAD-EDGE)
(FY22-FY25)

LDRD PROGRAM GOALS & PHILOSOPHIES

TRANSFORMATIONAL RESEARCH INSPIRED BY & ENABLING THE MISSION

Overarching CRO Strategies

- Align with Labs' strategic priorities and strategic direction.
- Create technology surprise through visionary research.
- Position the Labs strategically for the future.
- Implement metrics-based management.
- Increase transformational R&D.

Enable current and future national security missions

- **Mission Agility** – Enabling agile responses to national security challenges.
- **Technical Vitality** – Advancing the frontiers of science, technology, and engineering relevant to the Labs' missions.
- **Workforce Development** – Attracting, developing, and retaining tomorrow's technical workforce.

Maintain investments across all stages of R&D

- **Discovery** – Study of fundamental aspects of phenomena and of observable facts.
- **Applied** – Systematic study to gain knowledge or understanding necessary to determine the means by which a recognized and specific need may be met.
- **Development** – Application of knowledge or understanding directed toward the production of useful materials, devices, and systems or methods.

LDRD FUNDING AND UNIVERSITY COLLABORATIONS

SANDIA LDRD PROPOSALS

- Driven by Sandia PIs
- Facilitate connections between Sandia and academia
- Seed projects (as opposed to maintain) collaborations

UNIVERSITY COLLABORATIONS

- Can be funded through the core project
- Can be funded through supplemental funding managed by Sandia University Partnerships Network portfolio

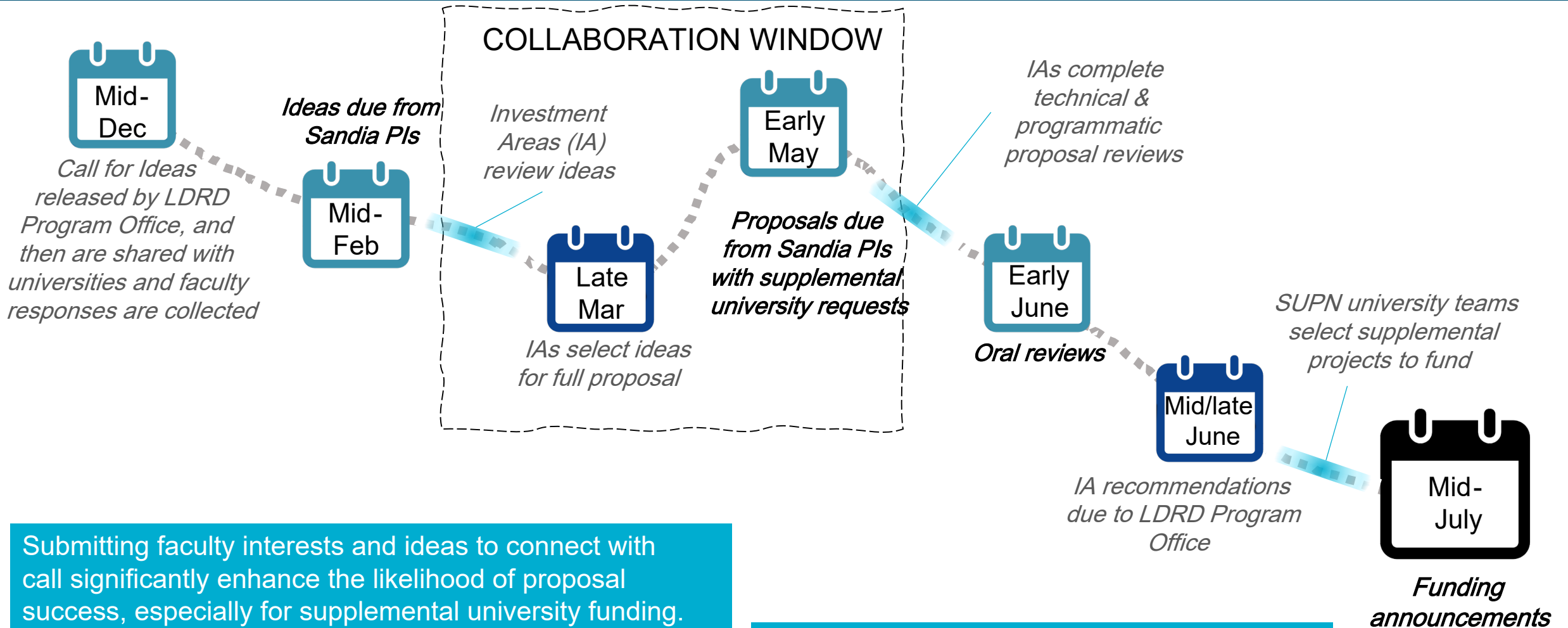
Funding can be used to support faculty research, student research assistants, project-related travel, and certain purchases if necessary.

Sandia PIs are responsible for submitting proposals for funding, but can collaborate with faculty on the proposal to gather information on the potential collaboration.

Communicating project needs and purchases early will enable Sandia to determine allowability.

U.S. citizenship is preferred for faculty and is expected for students working on Sandia LDRDs.

Sandia's LDRD Process & Key Dates



Submitting faculty interests and ideas to connect with call significantly enhance the likelihood of proposal success, especially for supplemental university funding. Information is available to Sandia PIs for other program calls.

Funding runs from October 1 (or as soon as contract is completed) to September 30.



LDRD projects are foundational

~450

LDRD PROJECTS

44%

NEW PROJECTS

56%

SECOND/THIRD-YEAR PROJECTS

RESEARCH FOUNDATIONS (RF)

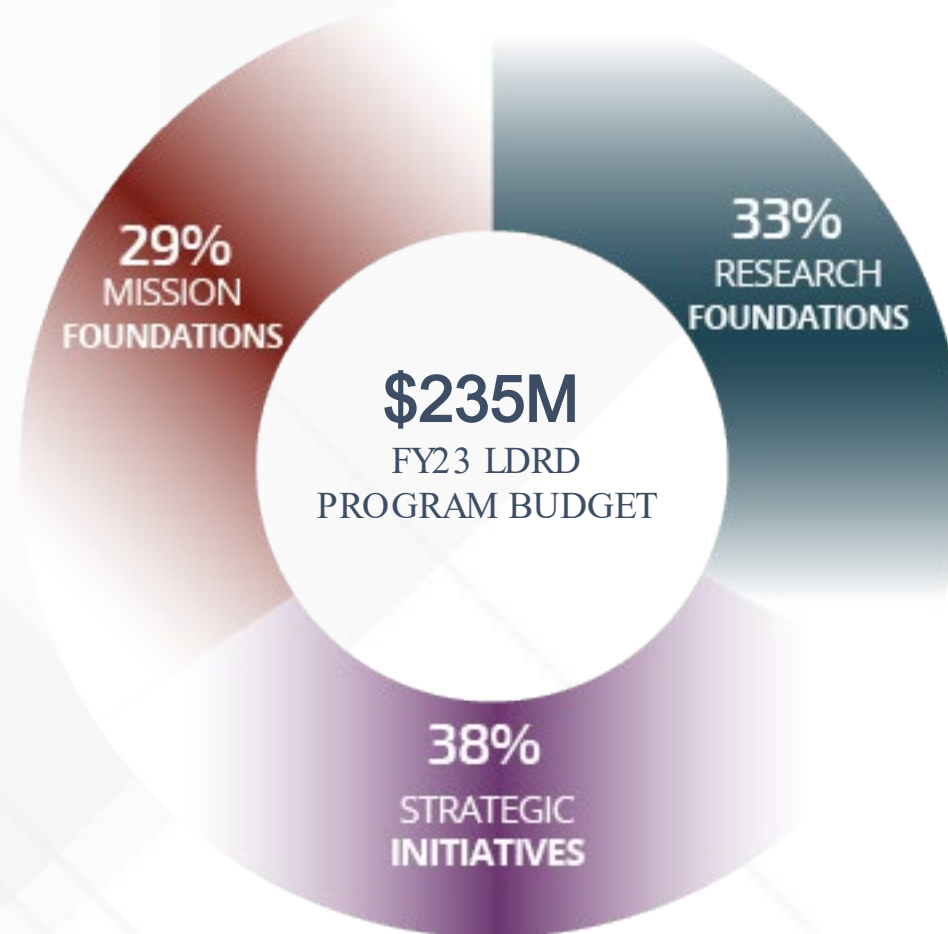
Conduct **fundamental/discovery and use** -inspired research in disciplines germane to national security mission needs.

MISSION FOUNDATIONS (MF)

Conduct **applied research** in areas directly relevant to current and anticipated missions.

STRATEGIC INITIATIVES (SI)

Bridge or advance science, technology, and engineering to meet mission demands. The research is strategic, involves cross-collaboration, and is directed by the CRO Fellows, or Labs-directed.



Sandia Academic Partnership Team for NMT



Sandia University Partnerships Network
NM PARTNERSHIPS - NEW MEXICO TECH

Sandia Leadership, Business, and Communications Team



Doug Kothe
Associate Lab Director
& Chief Research
Officer



Ron Baker
NMT Campus
Executive



Adele Doser
NMT Campus
Partnership Manager



Angela Meyer
NMT Admin &
Communications



Basil Hassan
Deputy Chief Research
Officer



Diane Peebles
Academic Programs
Senior Manager



Josh Martinez
NMT Partnership
Development



Antoinette Cummings
NMT Recruiting Lead



Sandia University Partnerships Network (SUPN)

Facilitating access to talent, ideas, and research & development capabilities

SUPN Goals:

- Cultivate Strategic & Enduring Institutional Relationships
- Build & Grow Impacts of Research Collaborations
- Stimulate Workforce Development
- Fuel the Talent Pipeline



Highlights of Sandia/NMT Partnership

- Sandia and NMT have a long history of successful collaborations with Sandia funding numerous research projects each year
- Foci in Advanced Instrumentation, Space Systems, Cyber Security, Infrastructure Resilience, Biology, Energetics, and Artificial Intelligence.
- 23 joint publications in 2021-2023 calendar years
- Student research institutes in the area of cyber security and atmospheric research
- In FY23, Sandia funded \$960K in research contracts at NMT, including 4 Alliance LDRDs (~\$300K)
- Approximately 320 NMT alumni currently work at Sandia
- 8 Sandians serve on NMT advisory boards
- 7 Sandians hold university affiliations with NMT



Further Information

- Link to unlimited release version of FY25 LDRD call:
https://www.sandia.gov/app/uploads/sites/113/2023/12/SUPN_IAResearchSummaries.pdf
- POCs:
 - Ron Baker (rmbaker@sandia.gov), campus executive
 - Adele Doser (abdoser@sandia.gov), campus partnership manager



Acknowledgements

Special thanks to Natalie Pitcher, Nadine Miner, Angela Meyer, and Michael Green for these slides



Sandia University
Partnerships Network

Questions?



Back-Up



SUPN STRUCTURE for corporate supported universities

Establish and cultivate enduring strategic and mutually beneficial relationships with a focused set of schools

Alliance Partners

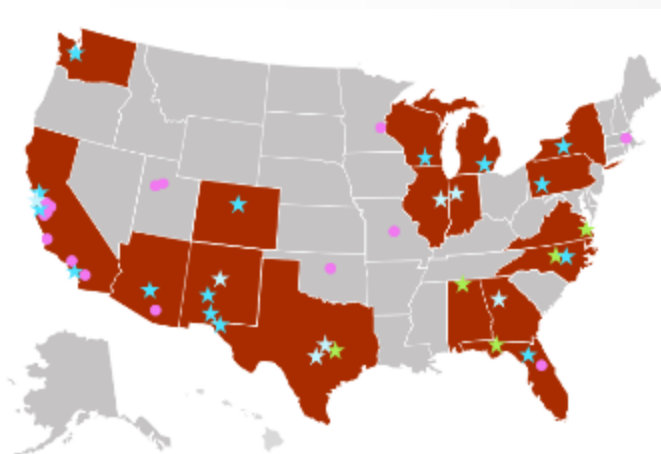
- GA Tech
- Purdue
- TX A&M[^]
- Univ CA - Berkeley
- Univ IL
- Univ of NM[^]
- Univ of TX - Austin

National/Regional Partners

- | | |
|----------------------------|-----------------------------------|
| AL A&M [*] | Prairie View A&M [*] |
| AZ State [^] | Stanford |
| Carnegie Mellon | Univ of CA - Davis [#] |
| Cornell | Univ CA - LA |
| FL A&M [*] | Univ of CO - Boulder |
| NM Tech [^] | Univ of FL |
| NM State [^] | Univ of MI |
| NC A&T [*] | Univ of TX - El Paso [^] |
| NC State | Univ of WA [#] |
| Norfolk State [*] | Univ of WI |

Recruiting Only ¹

- Brigham Young Univ
- CA Poly San Luis Obispo
- CA State East Bay^{^#}
- Caltech
- Las Positas College[^]
- Missouri S&T
- MIT
- OK State
- San Jose State^{^#}
- Univ of AZ[^]
- Univ of Central FL[^]
- Univ of MN[#]
- Univ of Southern CA
- Univ of UT
- Univ CA Davis San Ramon



Securing Top Academic Research & Talent with HBCUs

¹ May be program/line partners

^{*} Historically Black College & University (HBCU)

[^] Hispanic Serving Institution (HSI)

[#] Asian American & Native American Pacific Islander Serving Institution (AANAPISI)



Light blue = Alliance Partners



Blue = National/Regional Partners



Green = START HBCUs



Magenta = Corporate recruiting only

SUPN Resources

All Alliance and National/Regional Universities have CRO and HR Resources



Committed Campus Executive is paramount to success

Deputy Campus Executives help connect more broadly

Dedicated LDRD investments at all Alliance and National/Regional Partners to seed collaborations

(does not include LDRD or program investments made outside of the CRO program)

Alliance Partner funding of ~\$1M/school

National/Regional Partner funding of ~\$300K/school

Support from the Academic Programs team

External joint proposal support

Connections to Corporate Partners (Legal, Procurement, Tech Transfer, LDRD, Prime Contract, ...)

Talent Acquisition support

Recruiting Specialist and Line Recruiting Lead

Recruiting Team

Alliance Partners receive additional resources

Campus Partnership Manager

Partnership Development staff

On-campus events and activities

ACADEMIC PROGRAMS MISSION

Building an innovation pipeline through partnerships that facilitate access to talent, ideas, and R&D capabilities

Stimulate innovation through strategic academic relationships while growing the talent pipeline and increasing workforce development opportunities.

▶▶▶ CULTIVATE STRATEGIC AND ENDURING INSTITUTIONAL RELATIONSHIPS

- Establish university engagement guidelines and best practices
- Facilitate research contracting and university memberships

▶▶▶ BUILD AND GROW IMPACTS OF RESEARCH COLLABORATIONS

- Develop university networks and joint research opportunities
- Capitalize on research seed funding

▶▶▶ STIMULATE WORKFORCE DEVELOPMENT

- Enable faculty exchanges/faculty loans/joint appointments
- Leverage university networks and research consortiums

▶▶▶ FUEL THE TALENT PIPELINE

- Maximize student and educational outreach events
- Recruit high-caliber, diverse candidates through targeted development initiatives
- Cultivate the pipeline in critical skills areas

Helping the line accomplish their mission objectives by facilitating and coordinating university relationships.

FY24 NMT SUPN LDRDs, ~\$325K



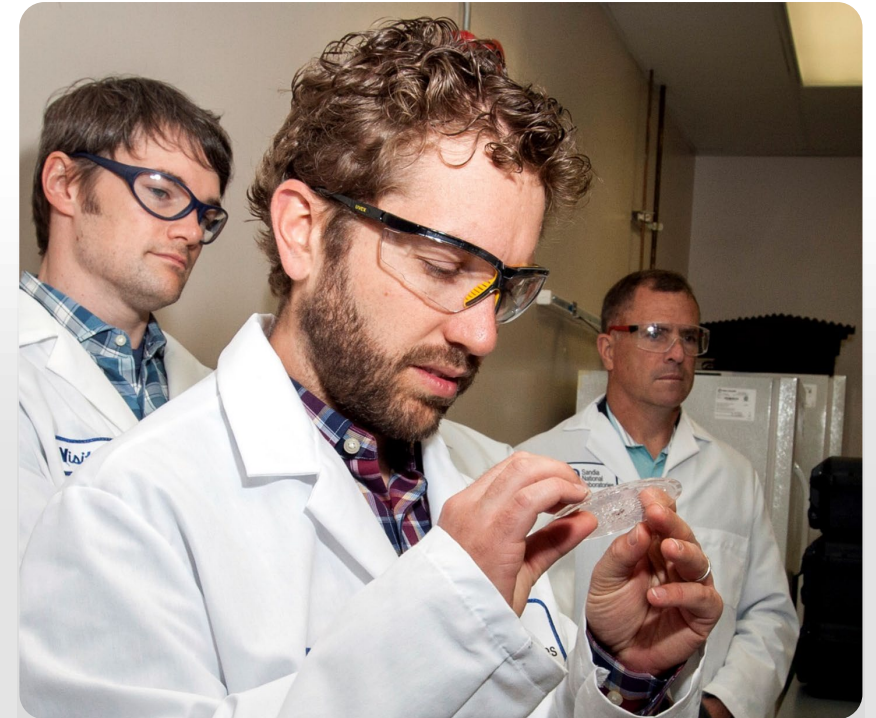
Sandia University Partnerships Network
NM PARTNERSHIPS - NEW MEXICO TECH

PI Org	New/Continuing	Title	Investment Area/ Focus Area	University Collaborator	Sandia PI
06771	NEW	High Fidelity Surface Interacting Explosion Models	Global Security	Mike Hargather	Mark Woods
01353	Continuing	Past, present, and future trends of global lightning with the USNDS space-based sensor constellation	Global Security	Richard Sonnenfeld	Julia Tilles
05345	Continuing	Sandia Wide Aperture Radar Magnifique (SWARM)	National Security Programs	Aly El-Osery	Hung Loui and David Olson

NEW (ACORN)	Title	Focus Area	University Collaborator	Sandia PI
(Early Career Award)	Understanding competitive adsorption between water, volatile organic compounds, and UiO-66 using ab initio molecular dynamics	E&HS	Deep Chouduri	Scott Bobbitt

Partnering with Sandia

- Sandia LDRD funding is *not* a grant, but a research contract with defined deliverables. The funding is managed by Sandia, and expectations vary by project.
- These projects are expected to develop **collaborative research relationships**, and not merely enable independent research by both institutions.
- Universities are expected to invoice projects in a timely manner, and adhere to agreed terms and conditions outlined in the contracts.
- Sandia may share some levels of sensitive information with universities, so please discuss Sandia project information before release and properly acknowledge collaborative work.
- University accomplishments and project results must be received **by the end of August** each year to be included in Annual Reports



UNIVERSITY PARTNERSHIPS SUPPLEMENTAL FUNDING

- Restrictions on university supplemental funding
 - Work is an enhancement to or an extension of the work proposed for core LDRD project.
 - Core project milestones can still be met if not funded.
 - Work is not attached to a Mission Campaign, Grand Challenge, or Exploratory Express project.
 - Total funding for purchases and contracts do not exceed 40% of the total LDRD funding.
- Selection criteria for university supplemental funding
 - Aligns with university's strategic focus areas.
 - Seeds and grows collaborations.
 - Builds strategic research partnerships.
 - Enhances Sandia's talent pipeline.
- Supplemental funding accomplishments and outcomes
 - Technical outcomes of the project.
 - Joint presentations and publications.
 - Student intern and post doc hires.
 - Follow on funding received.

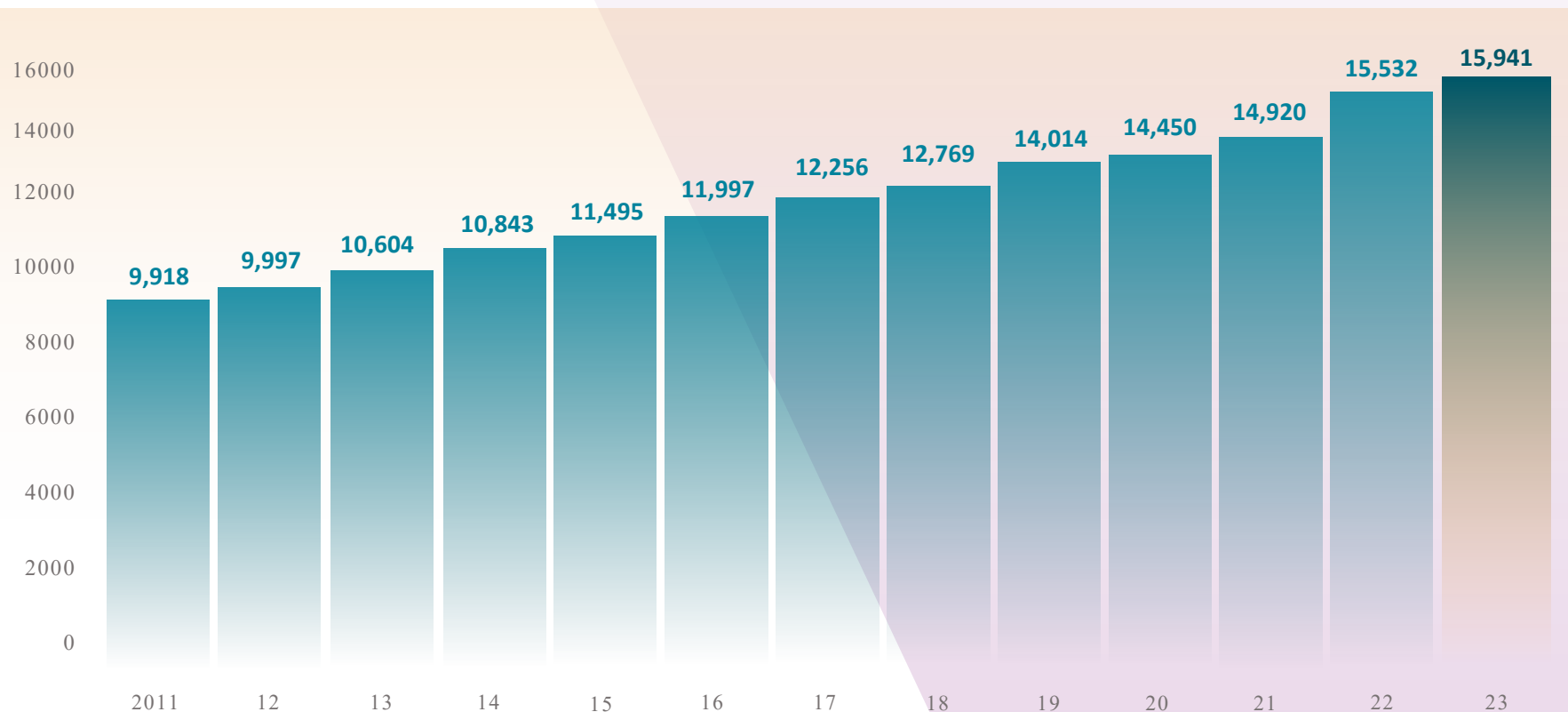
SANDIA'S WORKFORCE IS GROWING

Staff has grown by over 5,000 since 2011 to meet all mission needs



14,034
New Mexico

1,907
California









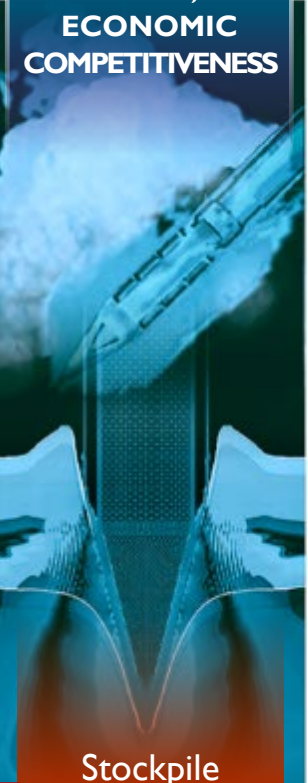


SANDIA IS A FEDERALLY FUNDED RESEARCH AND DEVELOPMENT CENTER (FFRDC) MANAGED AND OPERATED BY

National Technology & Engineering Solutions of Sandia, LLC, a wholly owned subsidiary of Honeywell International Inc.

Government owned, contractor operated

FFRDCs are long-term strategic partners to the federal government, operating in the public interest with objectivity and independence and maintaining core competencies in missions of national significance

OUR MULTIMISSION ROLE HAS EXPANDED OVER THE DECADES

1950s	1960s	1970s	1980s	1990s	2000s	Today
NUCLEAR WEAPONS ENGINEERING AND TESTING	NW STOCKPILE DIVERSITY AND BUILD-UP	NW + ENERGY: MULTIPROGRAM LABORATORY	DOE MULTIPROGRAM + MISSILE DEFENSE AND OTHER DoD WORK	DOE MULTIPROGRAM + DoD, ECONOMIC COMPETITIVENESS	EXPANDED NATIONAL SECURITY ROLE POST 9/11	MULTIMISSION LAB: LEPs CYBER, BIO, SPACE, TERRORISM
						
Arms race	Cuban missile crisis & Vietnam War	Energy crisis	End of Cold War	Stockpile stewardship	Broader national security	Evolving national security challenges