SAND2022-5790C

Exceptional service in the national interest

Sandia National Laboratories

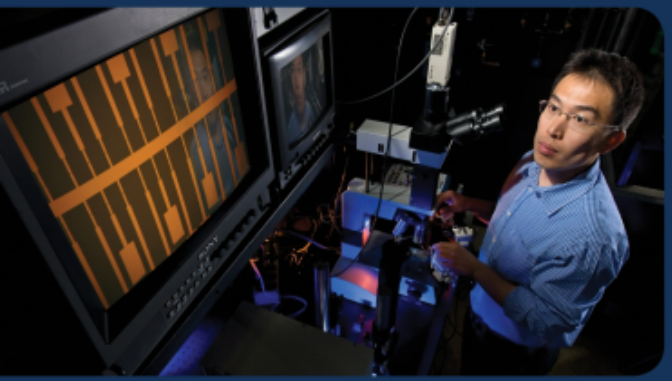
My Journey at a National Lab

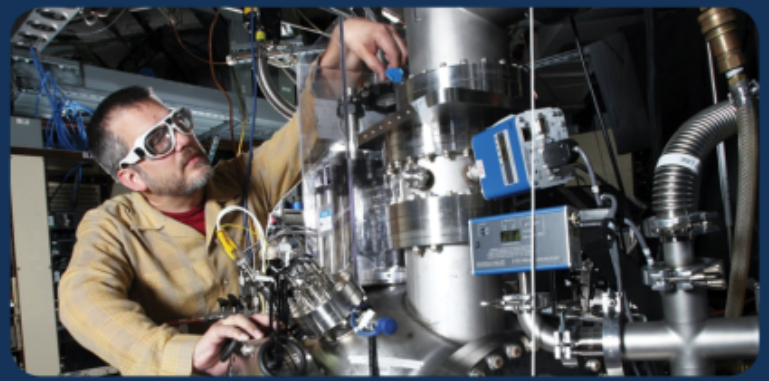
Dr. Patricia E. Gharagozloo

R&D Engineering Sciences Manager

Thermal/Fluid Sciences and Engineering

peghara@sandia.gov





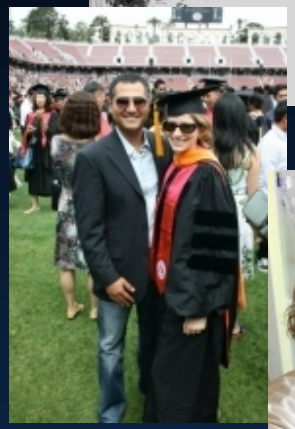
U.S. DEPARTMENT OF ENERGY

NNSA National Nuclear Security Administration

Sandia National Laboratories is a multi-mission laboratory managed and operated by National Technology and Engineering Solutions of Sandia, LLC., a wholly owned subsidiary of Honeywell International, Inc., for the U.S. Department of Energy's National Nuclear Security Administration under contract DE-NA-0003525.

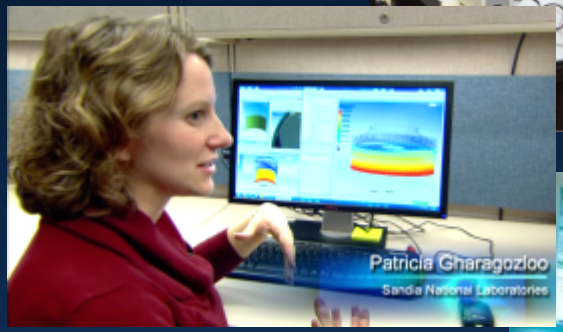
Equal opportunity employer/Disability/Vet/GLBT **04/2017**

My Journey



- Undergrad, Double BS Degree: University of Washington, June 2004
  - Mechanical Engineering; Applied Computational and Mathematical Sciences; Mathematics minor
  - IBM internship in 2002
  - Sandia internships in 2003, 2004
- Married my husband Ali, June 2004
- Graduate, MS/PhD: Stanford University, June 2010
  - Mechanical Engineering – Microscale Heat Transfer
  - Thesis: Characterization and Modeling of Temporal Thermal Diffusion / Aggregation Effects on Heat Transfer in Nanofluids
  - Sandia internship in 2008
- Joined Sandia in March 2010 as Senior Member of Technical Staff
- Gave birth to our daughter Ahang, April 2012
- Gave birth to our son Arya, March 2014
- Promoted to Principal Member of Technical Staff in January 2015
- Promoted to R&D Manager in April 2016

Why I chose Sandia?

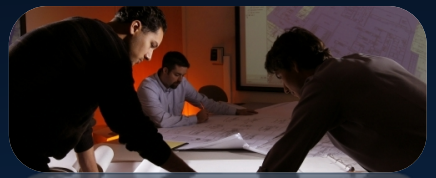


- State of the art facilities
- Cutting edge research
- Diverse research topics
- Service in the National Interest
- Work/Life Balance
- Inclusive culture
- Location in Bay Area
- Existing network/relationships

Fulfilling Our National Security Mission

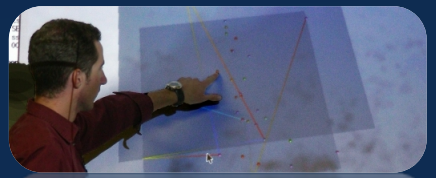
Sandia National Laboratories

Nuclear Weapons



International, Homeland & Nuclear Security

Energy & Climate



Defense Systems & Assessments

Our Foundations in Research

Sandia National Laboratories

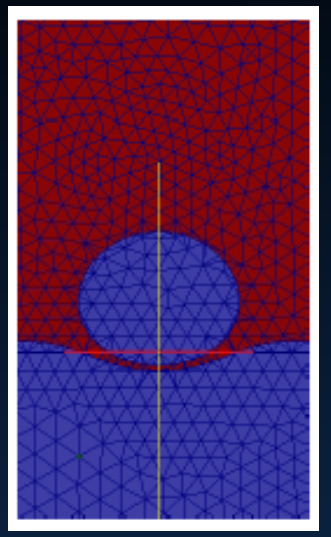
We support essential research-and-discovery activities that translate into invention, innovation, entrepreneurship, economic opportunity, and public benefit.

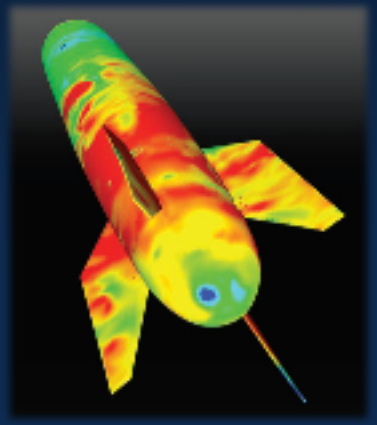
- Bioscience
- Computing and Information Science
- Engineering Science
- Geoscience
- Materials Science
- Nanodevices and Microsystems
- Radiation Effects and High Energy Density Science

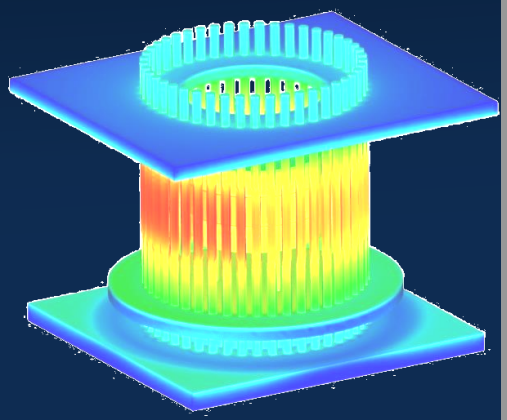
What is my career like at Sandia?

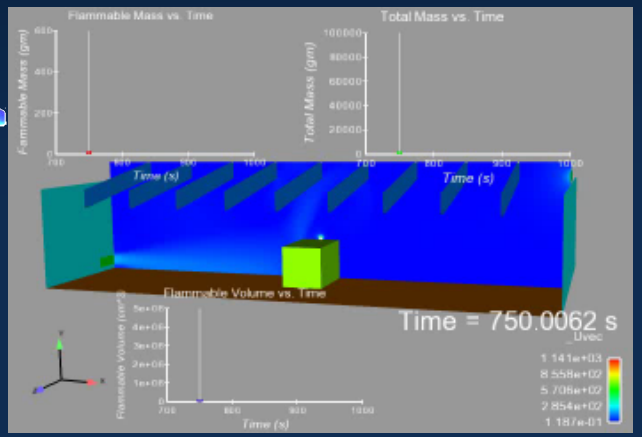
My Department

- Responsible for the development and application of predictive modeling capabilities for fluid dynamics and heat transfer at the California site
  - Fluid and thermal analysis for NW, energy, and industry
  - Physical model and computation technique development
  - Simulation and software code development and support
- Apply fluid/thermal modeling to wide range of fields







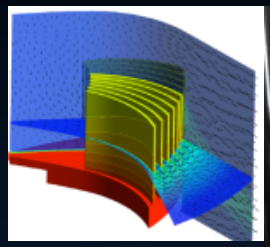


7

Staff Level Technical Work

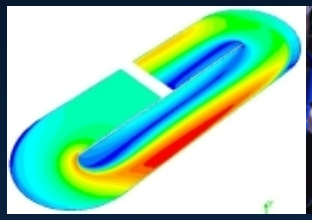
NW systems/component

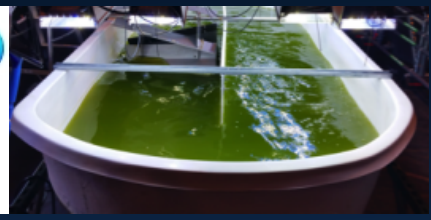
- W80-1 and W80-4: Led thermal analysis team
- B83: Analysis support.
- GTS: Led S&T Roadmap Function and Delivery Section

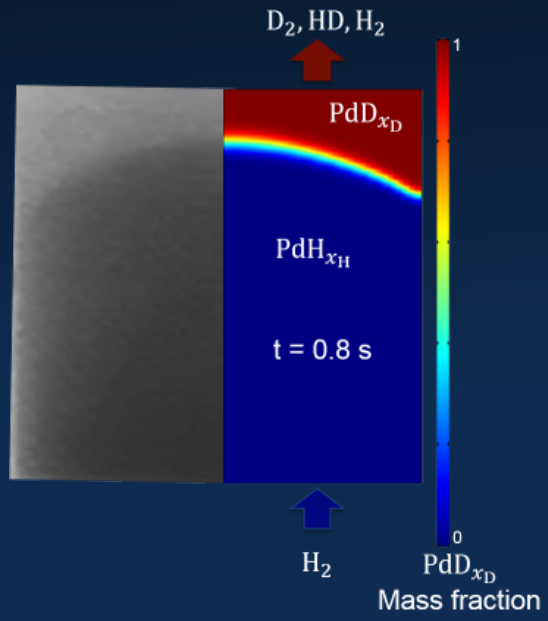


Sandia Cooler

- Led Thermal/Fluid analysis and parameter study







Algal biofuels

- Led Thermal/Fluid model development/verification

Metal hydride thermal decomposition and isotope exchange

- Lead interdisciplinary teams to develop models of UH3 and PdH thermal decomposition and isotope exchange.
- Work closely with experimentalists for model verification

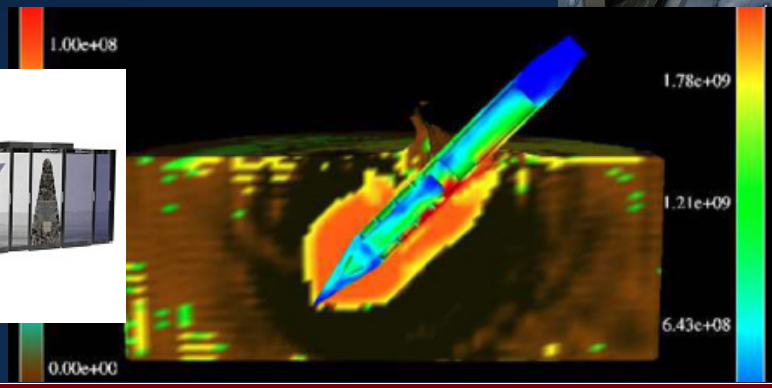
Management Level Work

Line Management

- Guide work of the department
- Build relationships with staff and customers
- Coach and develop staff members

Program Management

- Advanced Simulation & Computing
  - Verification and Validation Full System Models
  - Abnormal Thermal Mechanical Combined Environment
- Engineering Sciences integration with W80-4 LEP



Non-Technical Work

Stanford Recruiting Team Lead

- Built connections with Institute for Computational Mathematical Engineering
- Continued MEWG/SOLE connections

Diversity and Inclusion

- Led Policy Reformers team
- Presented on adverse impacts using GPA as hiring screen

SWC committee member

- Co-chair Women's Inreach Network CA
- Chair New/Expecting Parents committee
  - Coordinate with LLNL New Moms Group

Thunderbird Toastmasters Board

Career Paths

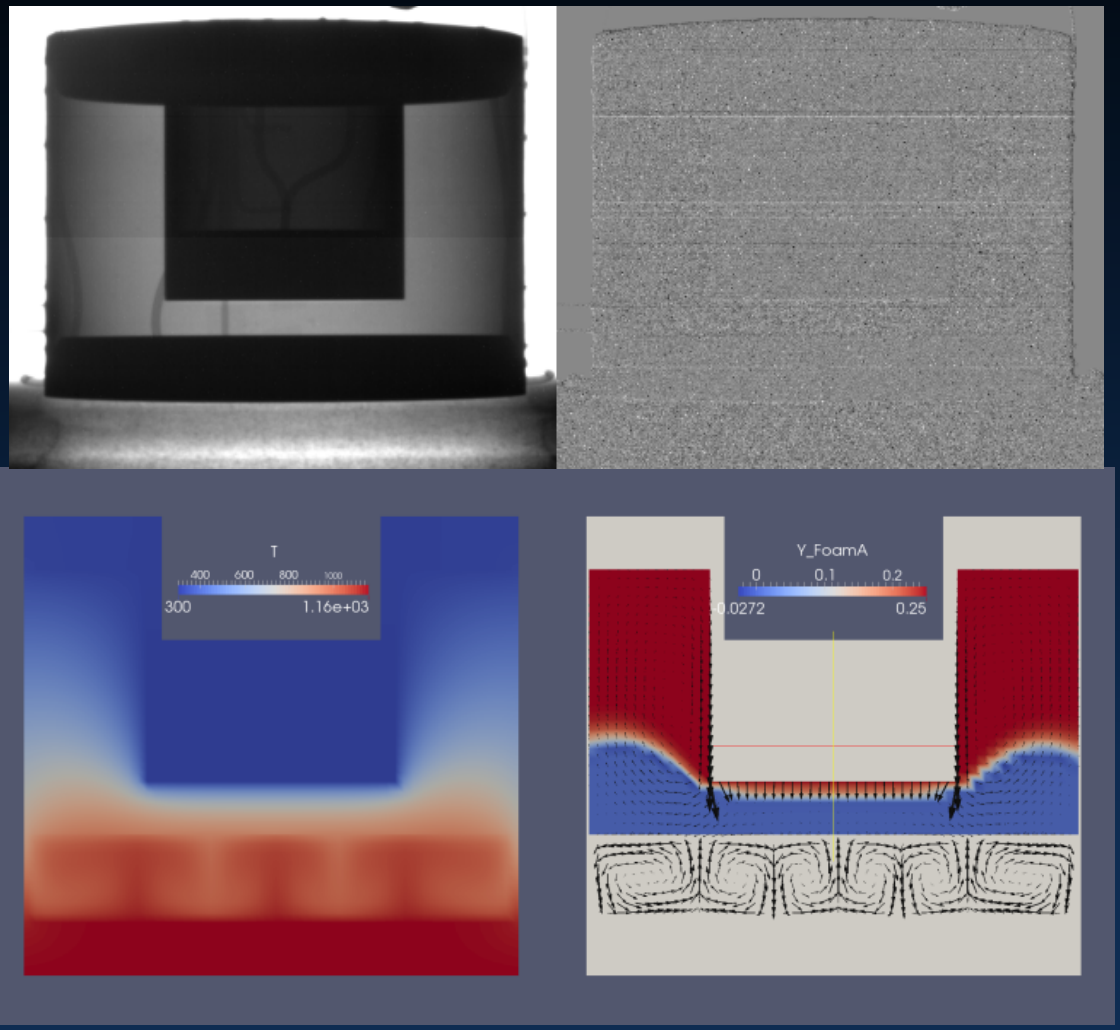
Sandia National Laboratories

Technical	Management
Science	Engineering
R&D	Programmatic
NW	Energy
Deep Expertise	Broad Understanding
Internal Funding	External Funding

Thank you!

Sandia National Laboratories

OMD



Exceptional service in the national interest

Sandia National Laboratories

Thank You

Backup Slides

Sandia California - *Livermore*

On-site workforce: ~1,300

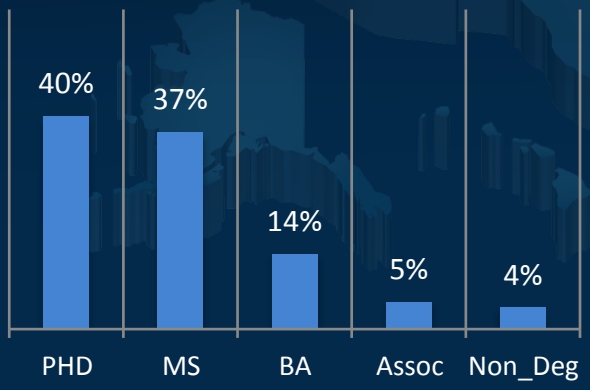
R&D staff: ~500

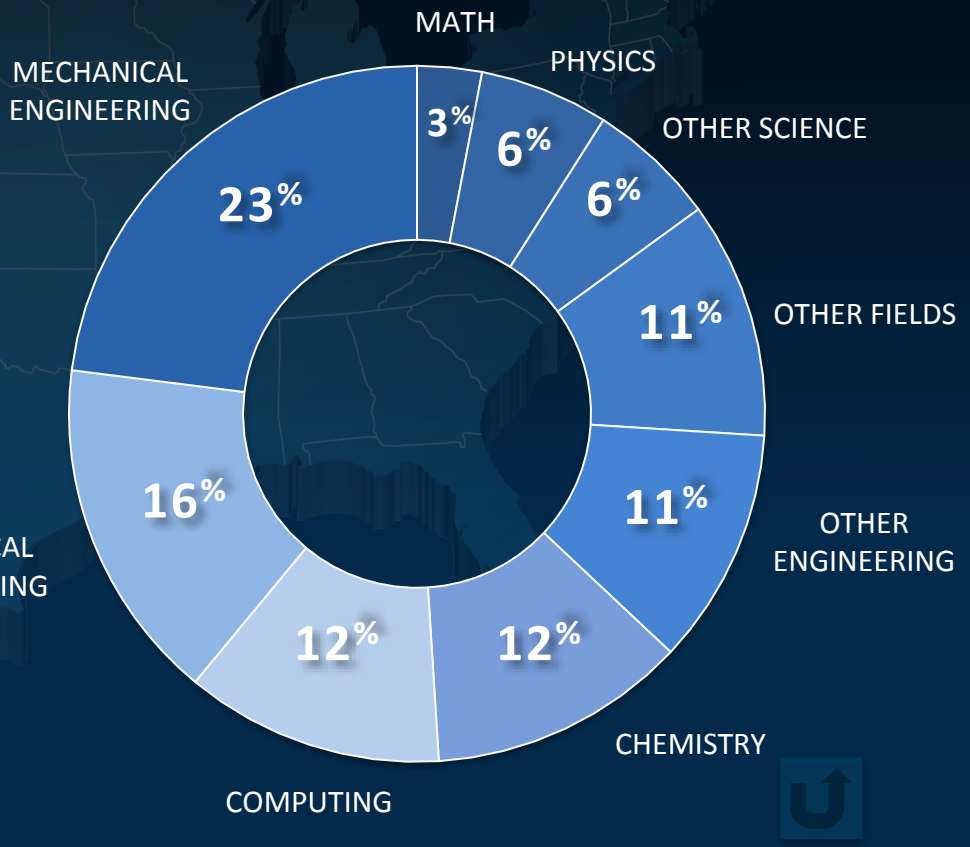
(excluding R&D Tech)

Distinguishing research capabilities:

- Applied Biosciences
- Combustion Research
- Information Systems
- Micro & Nano Technologies and *more*

Degree Level





Sandia New Mexico - *Albuquerque*

Sandia National Laboratories

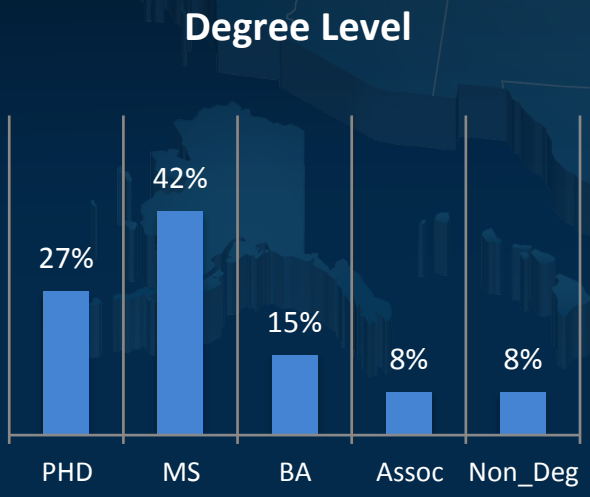
On-site workforce: ~10,500

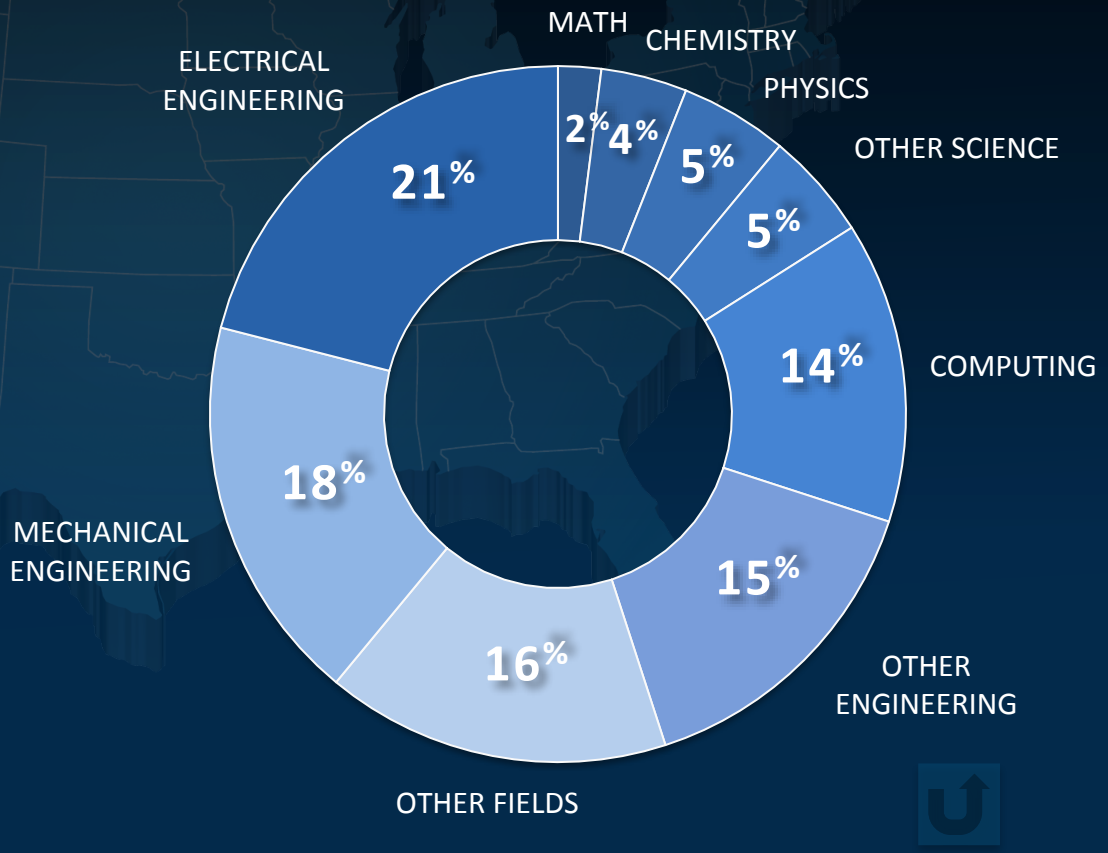
R&D staff: ~3,500

(excluding R&D Tech)

Distinguishing research capabilities:

- Renewable Energy
- Micro-electronics/Semiconductors
- Cyber Security
- Homeland Security *and more*



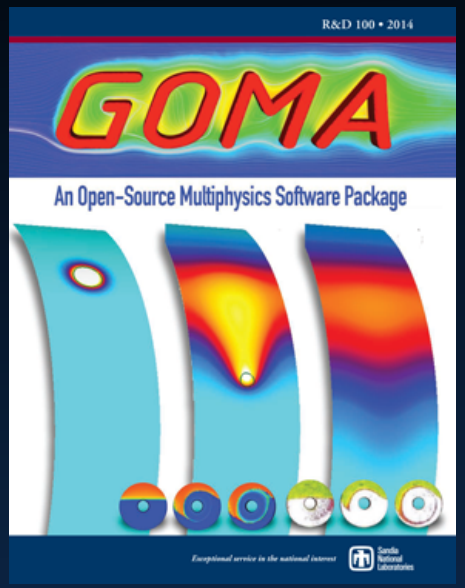


Work with real-world impact

Portable Diagnostic Device for Bacillus Anthracis Detection

Sandia developed a pocket-sized cartridge to sense concentrations of virulent B. anthracis, the bacteria that causes anthrax infection.

>> WATCH VIDEO



GOMA 6.0

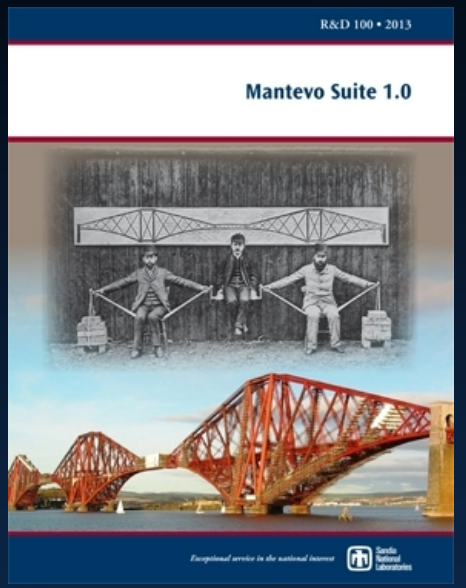
Sandia develops a software package for modeling and simulation, which solves problems in all branches of mechanics, including fluids, solids, and thermal analysis.

>> WATCH VIDEO

Triple Harvesting Plastic Scintillators

A new class of plastic scintillator enables efficient detection of illicit special nuclear materials that may be used to construct a nuclear weapon.

>> WATCH VIDEO



Montevo Suite 1.0

An integrated collection of small software programs (miniapps) models the performance of full-scale applications, yet requires a fraction of the code.

>> WATCH VIDEO

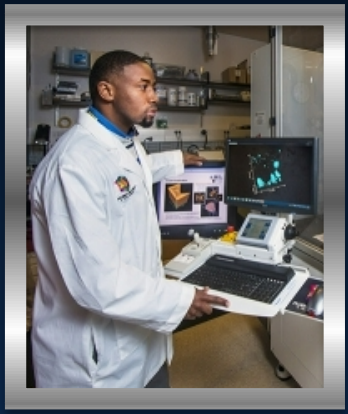
Work with top minds & be recognized

Sandia National Laboratories

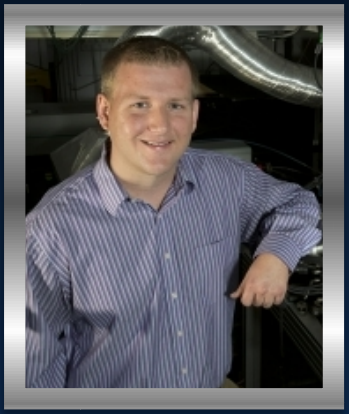
Our unique work requires the collective minds of the nation's top scientists, engineers, and support staff. Each year, Sandians are recognized for developing a range of breakthrough technologies with commercial applications of global importance.

Tamara Kolda
Fellow of the Society for Industrial and Applied Mathematics

Somuri Prasad
Asian American Engineer of the Year Award



Jon Madison
Black Engineer of the Year Award



Christopher Kliewer
Early Career Research Program Award

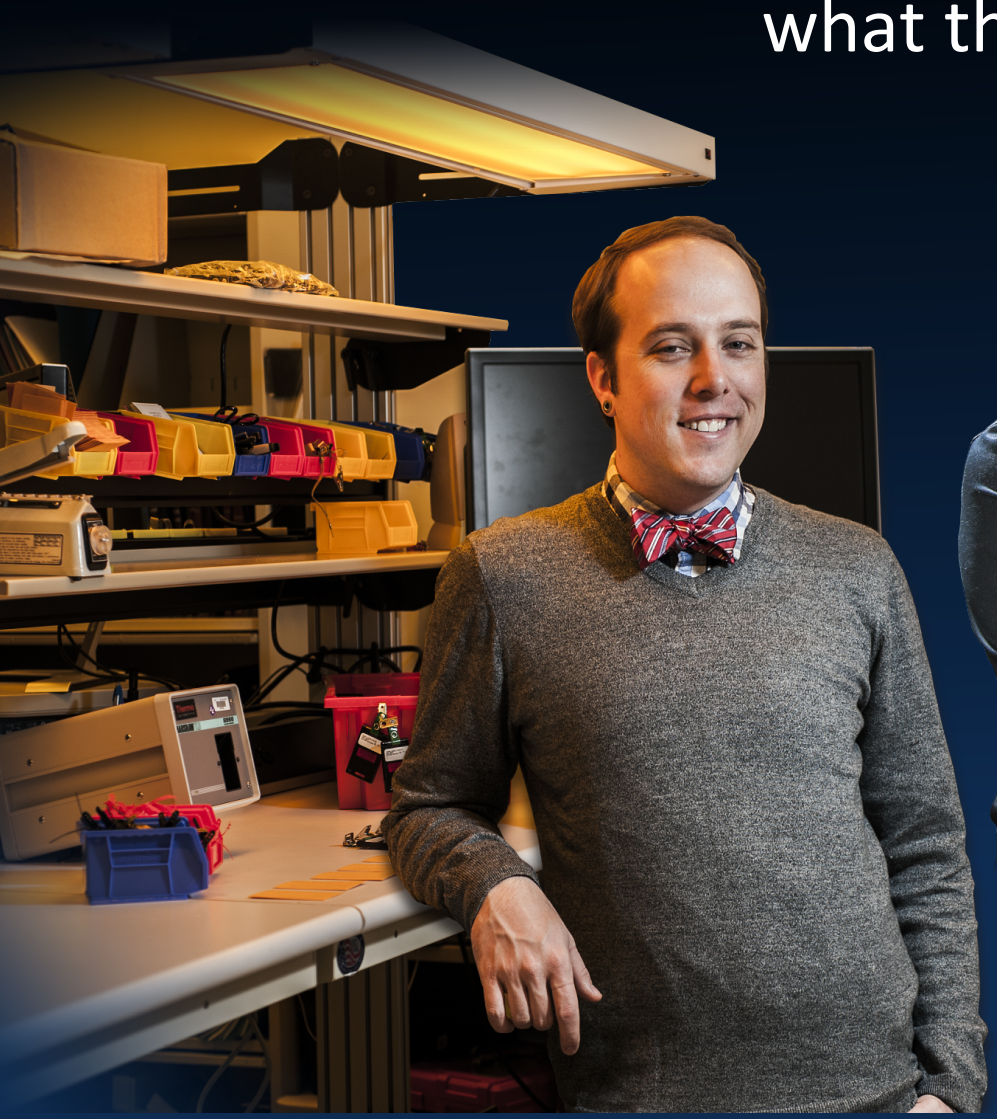
Inclusive Workforce

Outreach & Networking Groups

- American Indian Outreach Committee
- Asian Leadership & Outreach Committee
- Black Leadership Committee
- Hispanic Leadership & Outreach Committee
- Christians in the Workplace Networking Group
- Disability Awareness Committee
- Sandia Pride Alliance Network
- Military Support Committee

Newly Hired Sandians & what they're doing

Sandia National Laboratories



Nathan Elliott
University of New Mexico
& comic book collector

Alice Muna
Stanford University
& local foodie

Newly Hired Sandians & what they're doing

Sandia National Laboratories

Julia Craven Jones
University of Arizona
& cross-country skier

Matthew Denman
Massachusetts Institute
of Technology
& world traveler

Available Videos

Videos require wifi in order to play

Sandia National Laboratories

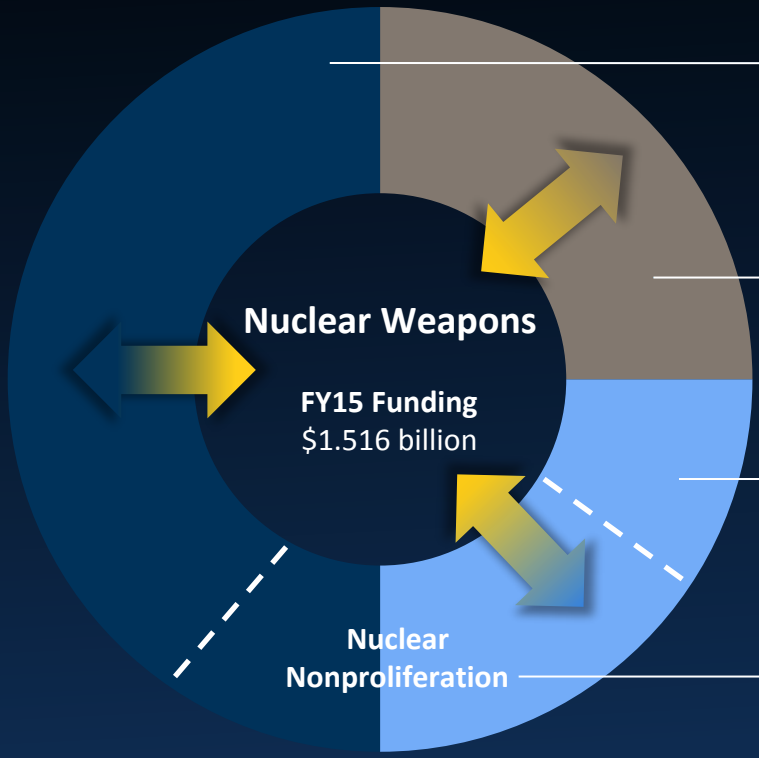
Sandia Mission Video (4:36)
Sandia Who We Are (3:05)

Location Videos
Sandia New Mexico Location (3:23)
Sandia California Location (3:23)

Diversity & Inclusion Videos
Black Leadership Outreach
Asian Leadership Outreach
American Indian Outreach
Hispanic Leadership Outreach

*For more Sandia Videos refer to Sandia's YouTube Channel

Sandia's Funding - ~$2.8 Billion



Department of Defense
$614M + $92M (Nuclear Nonproliferation)
= $706M

Department of Energy (DOE) Energy Programs
$167M

Department of Homeland Security & Department of Defense Infrastructure Security
$81M

NNSA Nuclear Nonproliferation
$144M

Note: **Other DOE and non-DOE Funding**
$195M

High reliability, high consequence of failure, challenging environments, and technology solutions

Nuclear Weapons

Sandia assumes an increasingly pivotal role in sustaining the nation's nuclear deterrent.

International, Homeland & Nuclear Security

Nonproliferation

Energy & Climate

Energy Security

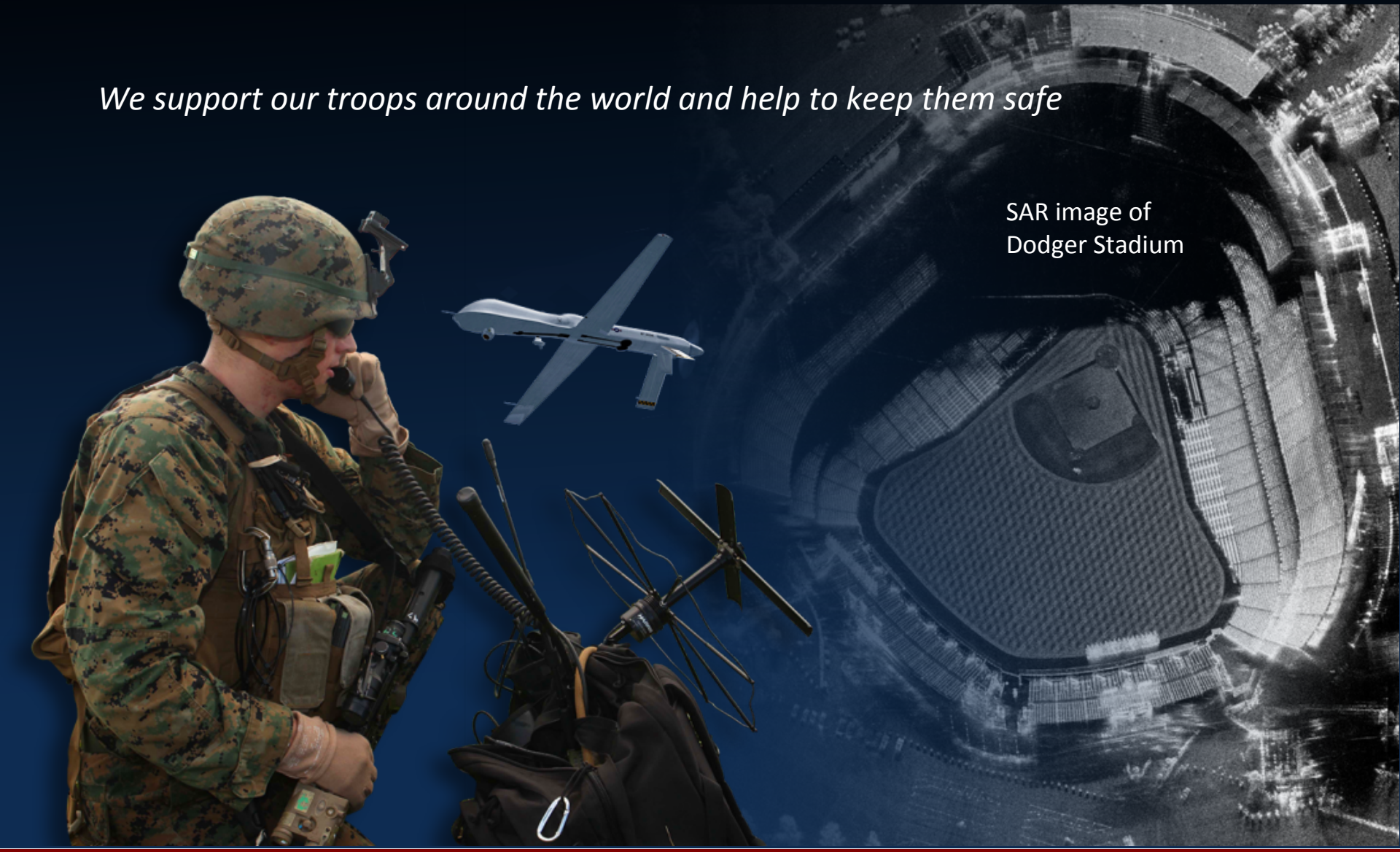
Climate Security

Infrastructure Security

Enabling Capabilities

Defense Systems & Assessments

We support our troops around the world and help to keep them safe



SAR image of
Dodger Stadium

Sandia National Laboratories

Our Workforce & Culture

Our Workforce ~12,000 employees

Sandia National Laboratories

~10,500 Regular employees

~1,600 Temporary employees, students & postdoctoral appointees

New Mexico Site:

Workforce: ~10,800

R&D employees: ~4,700

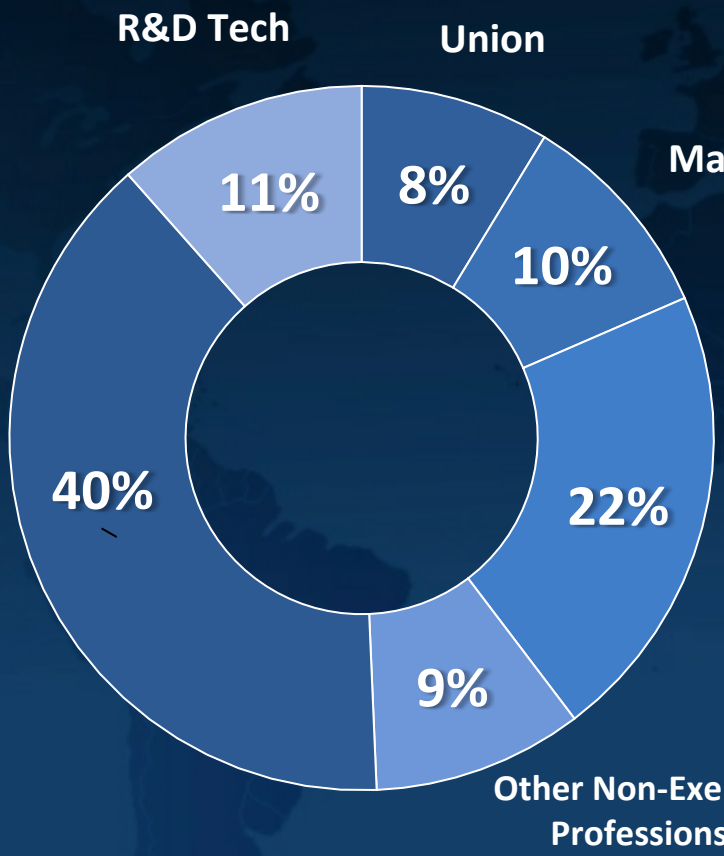
(R&D Staff & Technologists)

California Site:

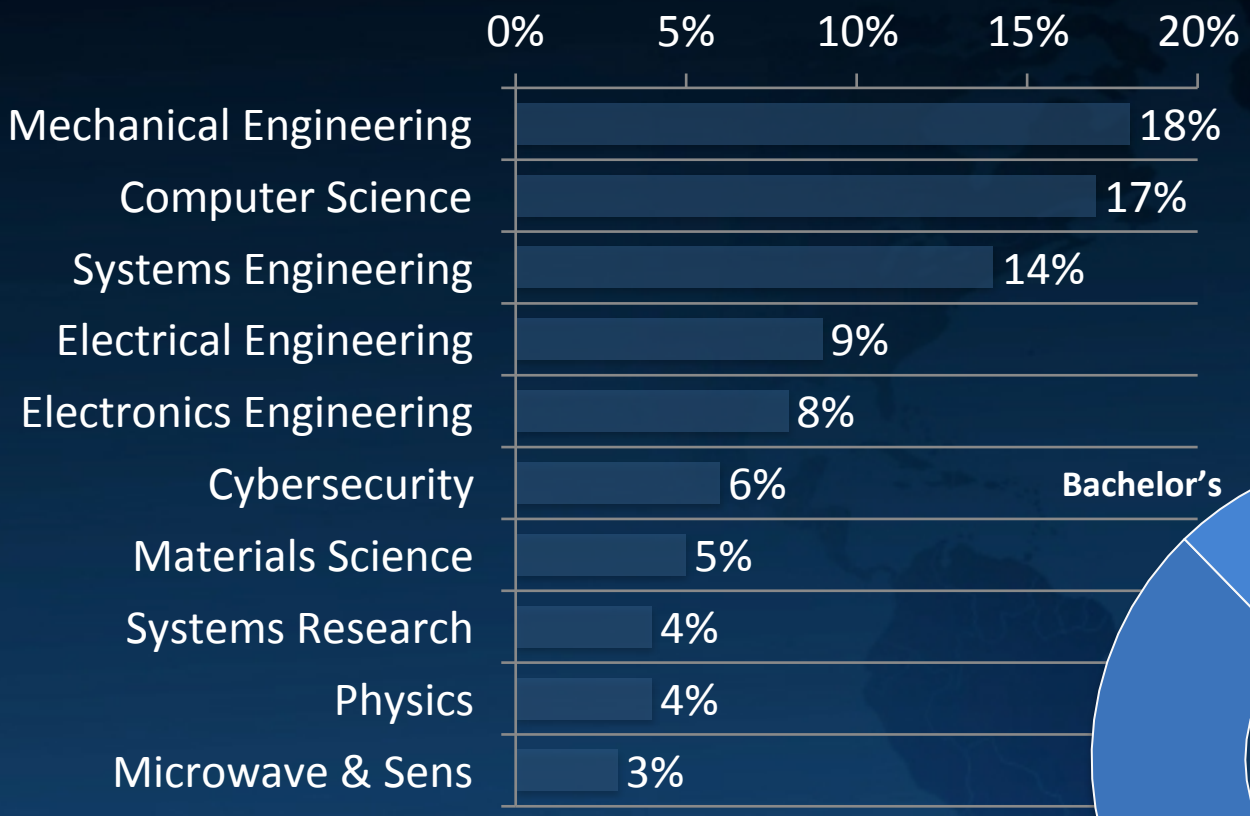
Workforce : ~1,300

R&D employees: ~600

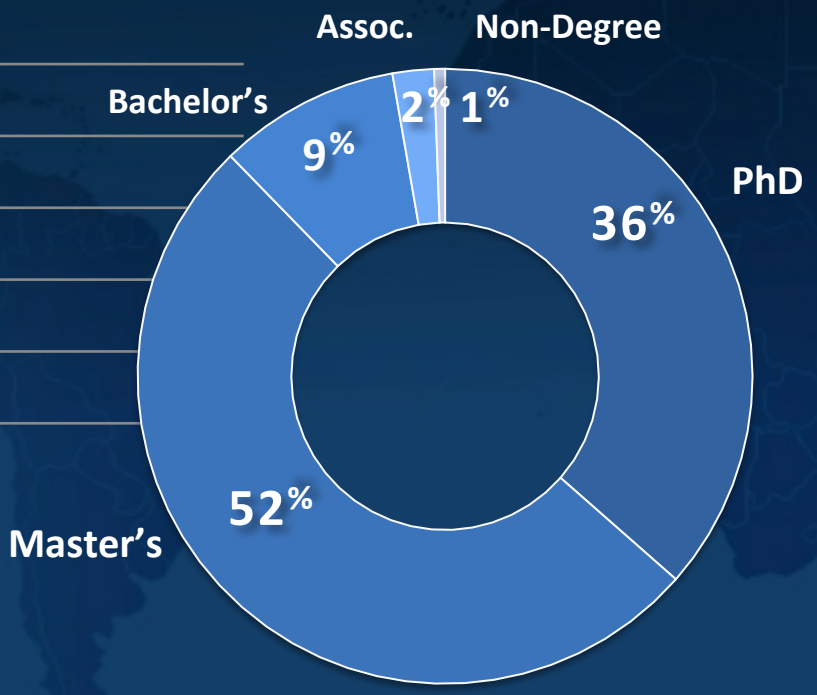
(R&D Staff & Technologists)



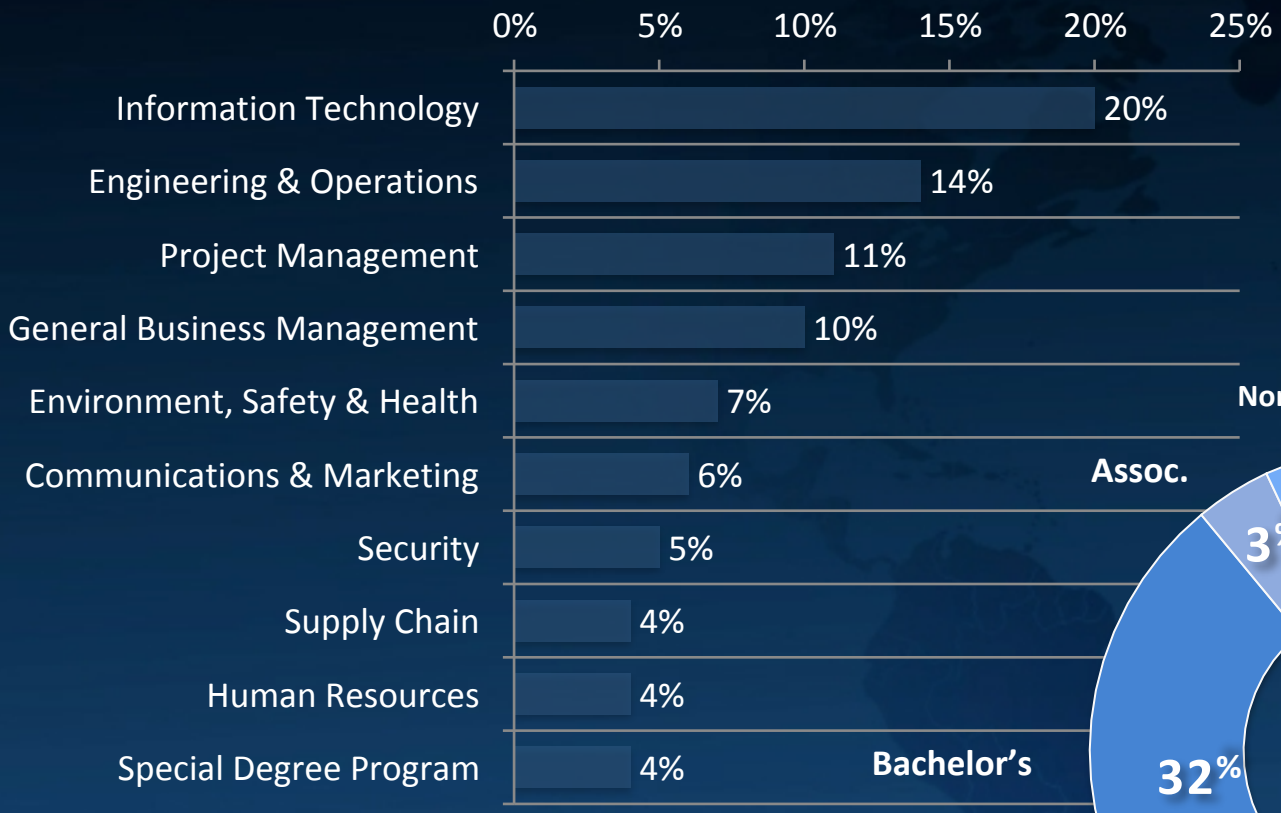
R&D by Discipline & Degree



Top 10 job descriptions shown, Regular exempt non-management employees only

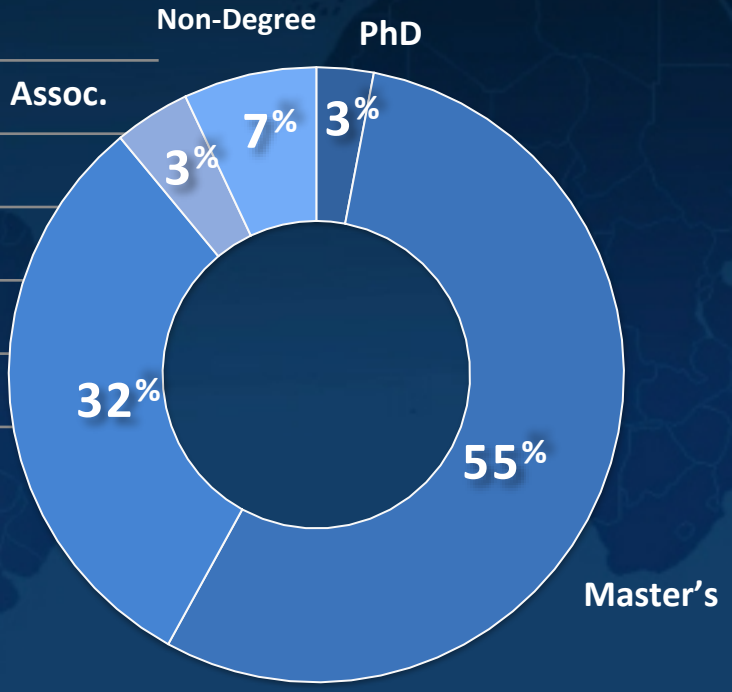


Business & Operations Staff



Top 10 job families shown , Regular exempt non-management employees only

Degree levels for all our non-management professions including those not represented



Our Culture – Giving Back

+ 100,000 Volunteer Hours Annually

~ $6 Million Donated to Nonprofits Annually

- Animal Adopt-a-thons
- Coach sports teams
- Lead scouting troops
- K-12 education outreach
- Help at food banks
- Build homes
- Contributions and drives

Special Programs, Education and Mentoring

University-based Education

- Tuition Assistance Program
- University Part-Time Program
- Special Master's Program
- Doctoral Study Program

In-house Education, Training and Mentoring Programs

- Business
- Communication
- Design and drafting
- Energy
- Health and wellness
- Information technology
- Manufacturing
- Marketing
- Project management
- Sciences

Employment Opportunities

Internships

Sandia National Laboratories

Encourages qualified students to develop interests in critical skills areas related to our mission, with the ultimate objective of developing our pipeline for our future. Available for Summer, Year Round and Co-op.

Eligibility Criteria

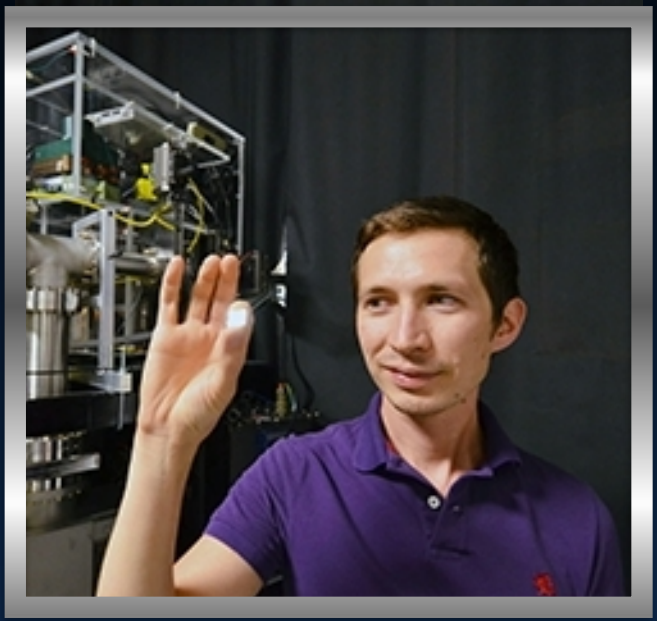
- Min. cumulative GPA (3.2 Undergrad/3.5 Grad)
- Have U.S. citizenship for positions that require clearance or as stated in the job posting
- Full-time enrollment status at an accredited college, university, or local high school
- At least 16 years of age

Technical Institute Internships

Technical institute interns perform leading-edge research under the guidance of Sandia research mentor and use world-class equipment and facilities.

- Center for Computing Research (CCR)
- Engineering Design and Integration Students (EDIS)
- Nonlinear Mechanics and Dynamics (NOMAD)
- Science of Extreme Environments Research Institute (SEERI)
- SENTINL: Energy Surety Incubator (ESI)
- SENTINL: Interns for Secruity, Arms Control, and Force Protection Engineering (iSAFE)
- TITANS: Center for Analysis Systems and Applications (CASA)
- TITANS: Center for Cyber Defenders (CCD)
- TITANS: Monitoring Systems and Technology Intern Center (MSTIC)

Post-doc Opportunities



Key areas for post-docs at Sandia:

- Biosciences and biotechnology
- Chemistry and materials science
- Combustion
- Computational mechanics
- Computer science
- Hydrogen
- Microelectronics and microfluidics
- Nanotechnology
- Physics

Eligibility Criteria

- A recent PhD (awarded within the past five years) or the ability to complete all PhD requirements before beginning
- No previous post-doc appointments at a national laboratory

Special Degree Programs & Fellowship Opportunities

Sandia National Laboratories

Special Degree Programs

- Critical Skills Master's Fellowship Program
- Master's Fellowship Program

Ph.D. Level Fellowships

- Harry S. Truman Fellowship
- John Von Neumann

The Work Experience

- Challenging assignments
- State-of-the-art research facilities
- Work with top minds
- Join outreach and networking groups
- Receive recognition,
  R&D 100 Awards *and more*
- Take a leave to pursue qualifying research and professional opportunities
- Receive patent royalties, if eligible
- Career mobility

Living in Albuquerque

Life in Albuquerque

- Albuquerque is the largest city in New Mexico with a population of over 500,000
- Affordable housing, reasonable cost of living
- Minimal traffic congestion

Watch:
Sandia New Mexico Video

Albuquerque Environment

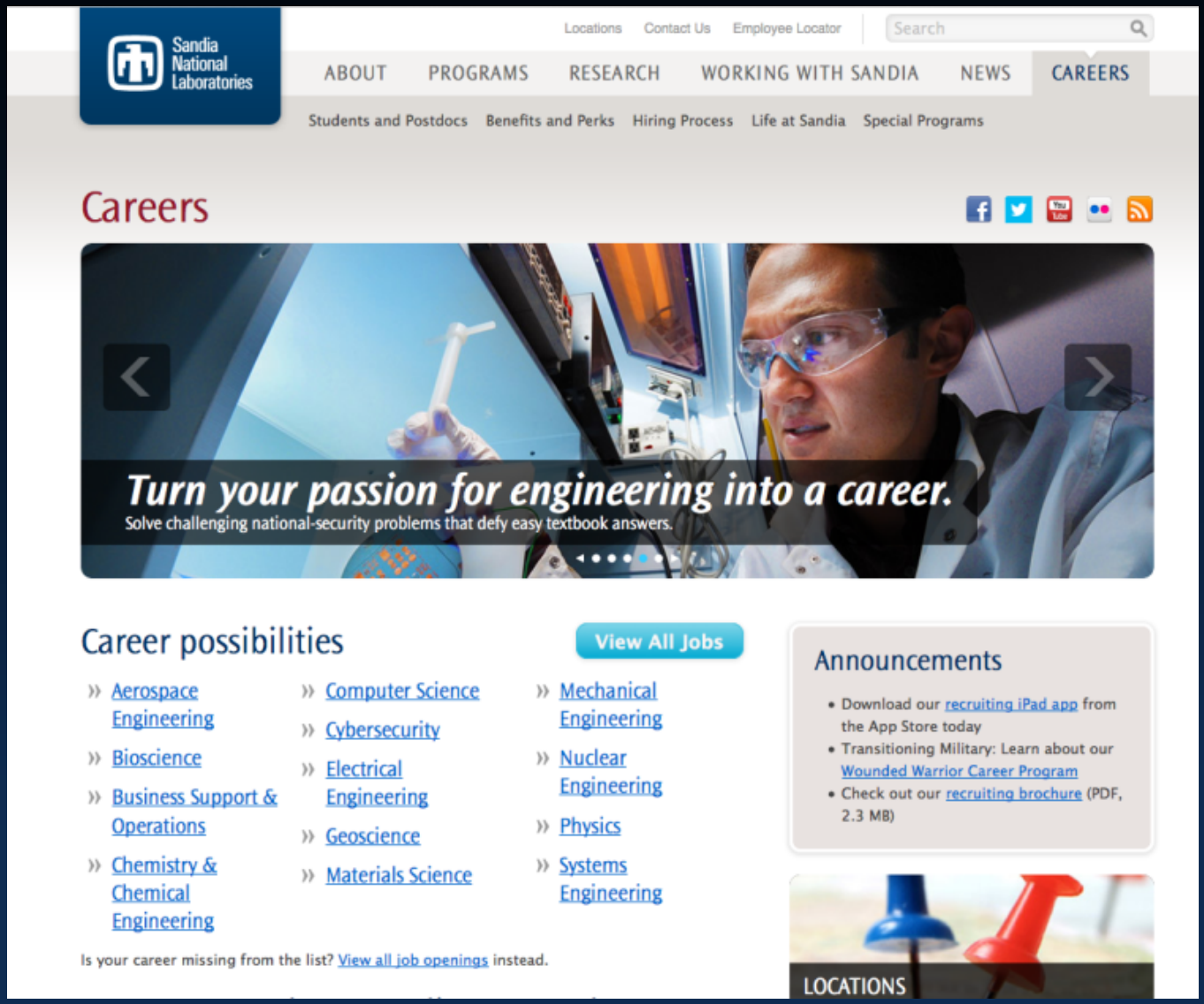
- High desert climate with 278 annual days of sunshine
- Average temperatures between 78˚ and 40˚
- Wide-open spaces

Things to Do

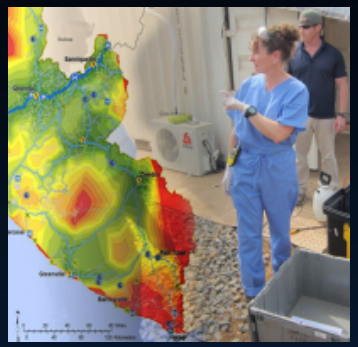
- Outdoor recreation - Ski, snowboard, hike, etc.
- Santa Fe – rich culture
- International Balloon Festival
- Explore Indian pueblos and our Hispanic heritage
- Green chile – NM Cuisine
- Museums, Parks, Sports

Apply Online! sandia.gov/careers

Sandia National Laboratories



Sandia's Impact



Ebola Outbreak

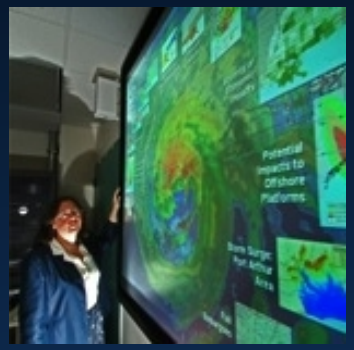
Sandia contributes to global response of Ebola outbreak by developing a sample delivery system cutting the wait time and potentially fatal exposure.

Detecting IEDs

Combat personnel now have a new tool for uncovering improvised explosive devices: Sandia's highly modified miniature synthetic aperture radar system, which is being transferred to the U.S. Army.

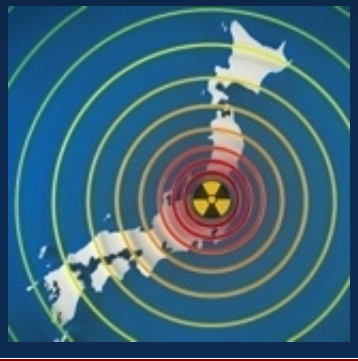
Cleanroom invented 1963

$50 billion worth of cleanrooms built worldwide It's used in hospitals, laboratories and manufacturing plants today.



Hurricane Katrina

Sandia is called to assess flooding and infrastructure failures.



Fukushima Quake

Sandia helps clean up radioactive wastewater.

9/11

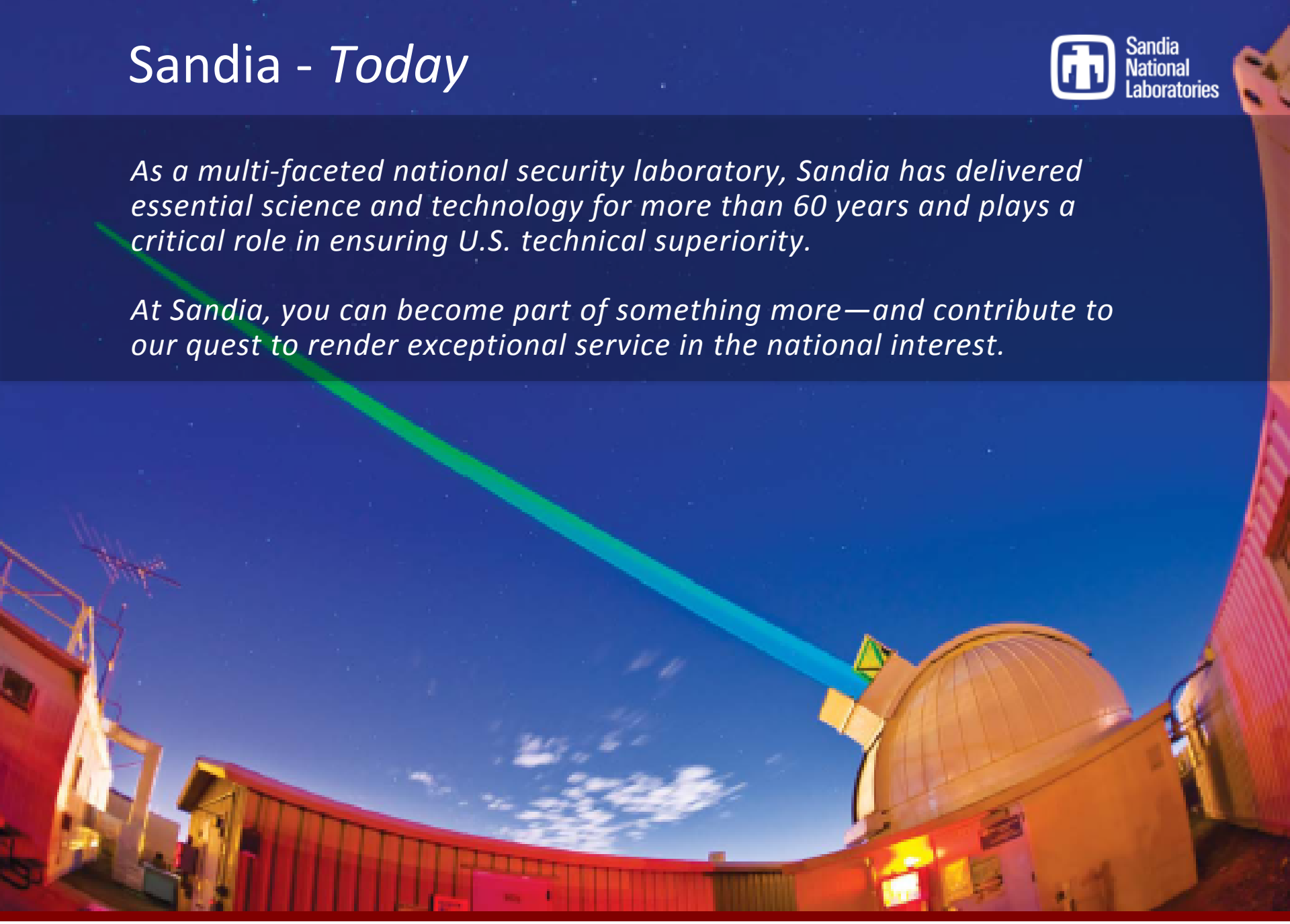
Sandia sets contingency plans for release of materials and aircraft attacks on critical facilities immediately after 9/11. Search dogs are equipped with cameras for search and rescue K-9 handlers. The capability allowed search efforts to be carried out in spaces inaccessible to humans.

Sandia - *Today*

Sandia National Laboratories

As a multi-faceted national security laboratory, Sandia has delivered essential science and technology for more than 60 years and plays a critical role in ensuring U.S. technical superiority.

At Sandia, you can become part of something more—and contribute to our quest to render exceptional service in the national interest.



Quality of Work/Life

Flexible Work Schedules

- 9/80 – work week
- Generous Paid Time Off
- 11 paid holiday – includes a winter shut down at the end of each calendar year
- Telecommuting arrangements
- Part-time options
- Vacation Buy Plan

Convenience

These amenities are available at CA and NM sites only

- On-site Medical Clinic
- Sandia Laboratory Federal Credit Union
- On-site Café
- On-site Fitness Center
- Access to group exercise classes, clubs and sports activities
- Employee self-formed sports teams

Family Life

- Referral services/ Workplace options
- Adoption assistance
- Family recreational activities

Health & Benefits

- Health risk assessment screenings
- Fitness programs
- Health education
- Major medical, dental & vision
- 401k Plan

Our Culture – Our Values

- We serve the nation
- We team to deliver with excellence
- We respect each other
- We act with integrity
- We live safe and healthy lives

Sandia is a National Laboratory

Sandia National Laboratories

Sandia has two main locations

Sandia National Laboratories

Living in Livermore

Life in Livermore

- Livermore's relaxed lifestyle populates nearly 81,000
- Close proximity to first-tier universities, Silicon Valley companies, and other top research laboratories and facilities
- Access to California's finest public and private schools

Watch:
Sandia California Video

Livermore Environment

- 260 annual days of sunshine
- Average temperatures between 73˚ and 46˚
- Annual average rainfall: 14.8 inches

Things to Do

- Vineyards
- Beaches
- State Parks
- Sports – Nearby are six major league franchises
- Art haven
- Proximity to SF Bay Area

Template Slide