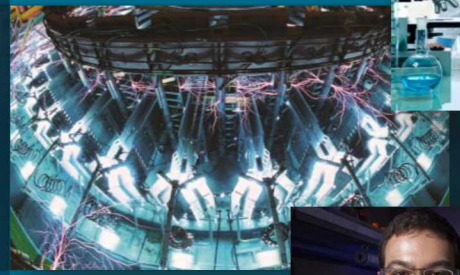
Sandia National Laboratories

SAND2019-3990PE



Sandia National Laboratories
Information Session

World-changing technologies.

Life-changing careers.

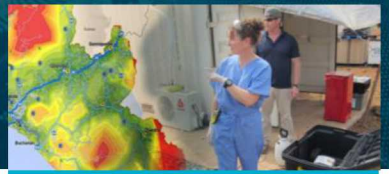
U.S. DEPARTMENT OF ENERGY

National Nuclear Security Administration

Sandia National Laboratories is a multimission 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. SAND2018-8688 HR **Equal opportunity employer/Disability/Vet/GLBT** **08/2018**

Sandia's Impact

Sandia is often called upon to respond to high-profile events, including 9/11 and the Ebola outbreak.



Ebola Outbreak

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

Cleanroom invented 1963

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

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.

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.

Sandia's Impact

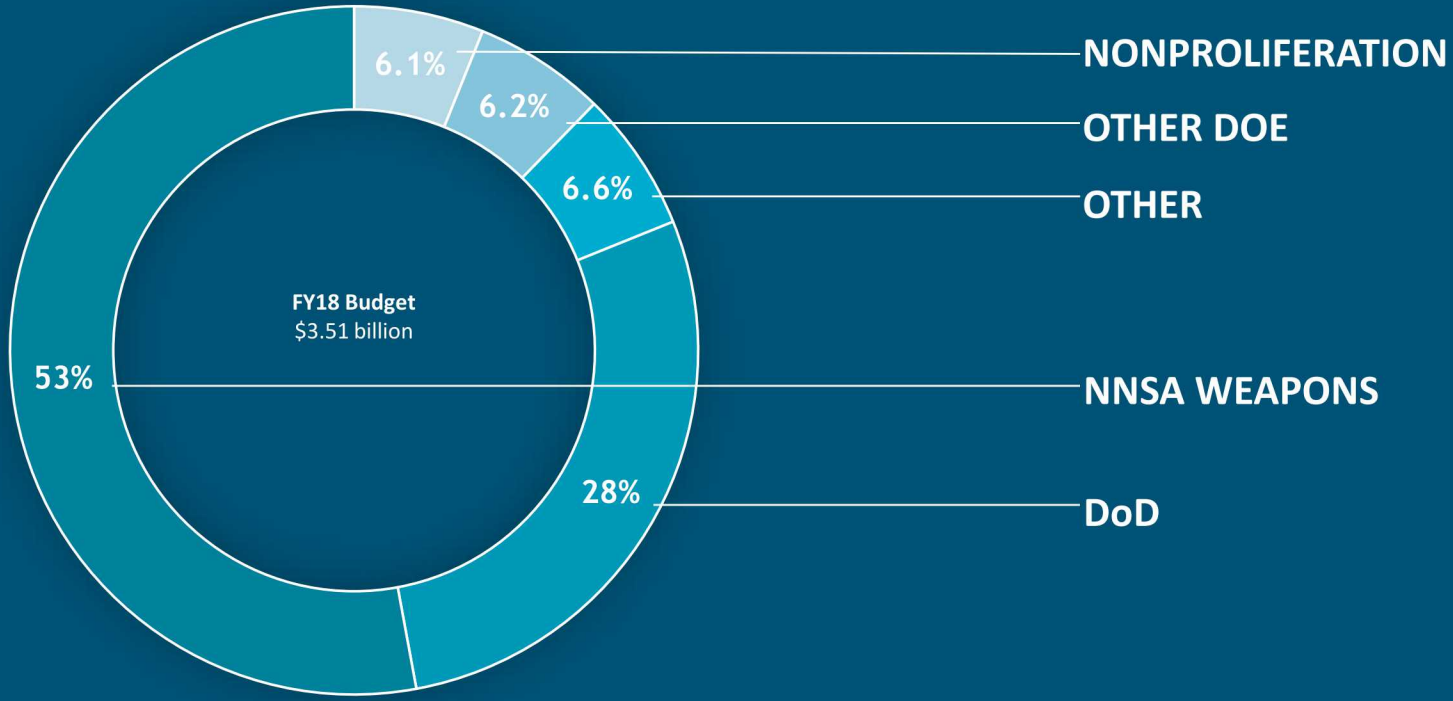
As a multi-faceted national security laboratory, Sandia develops advanced technologies to ensure global peace.

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

U.S. National Laboratories

Sandia Has Two Main Locations

Sandia's Funding ~ $3.51 Billion



Data as of July 2018

Fulfilling Our National Security Mission

Nuclear Deterrence

Defense Nuclear Nonproliferation

National Security Programs

Energy & Homeland Security

Advanced Science & Technology

We [illegible] of life.

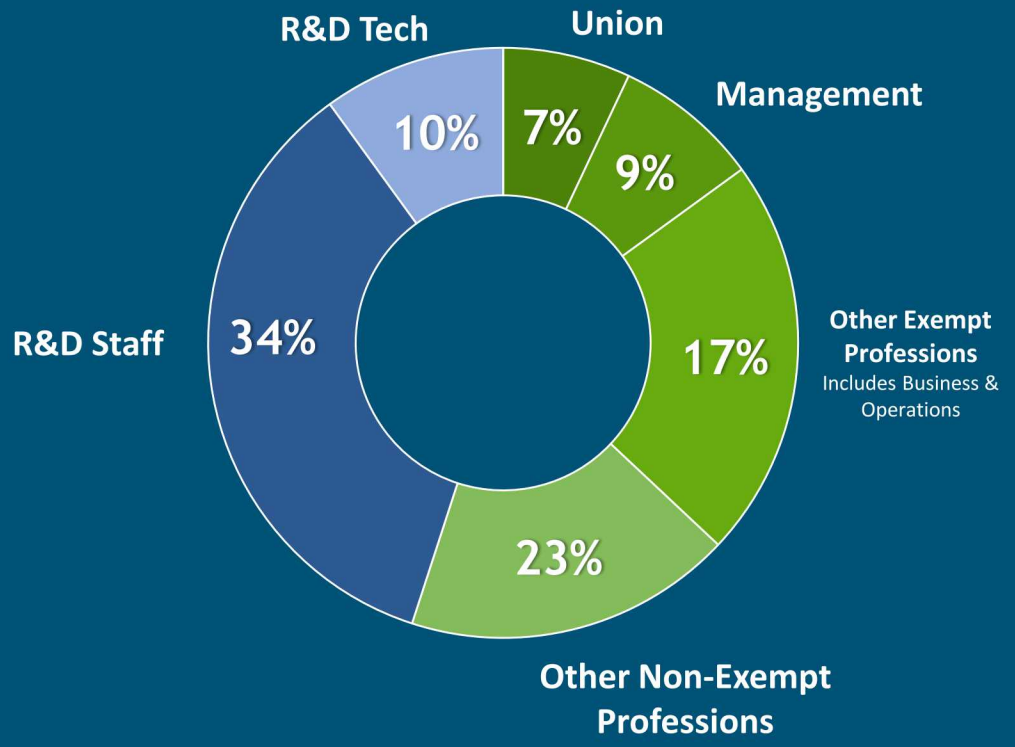
Our Workforce & Culture

Our Workforce ~12,900 employees

~11,200 Regular employees
~1,700 Temporary employees, students & postdoctoral appointees

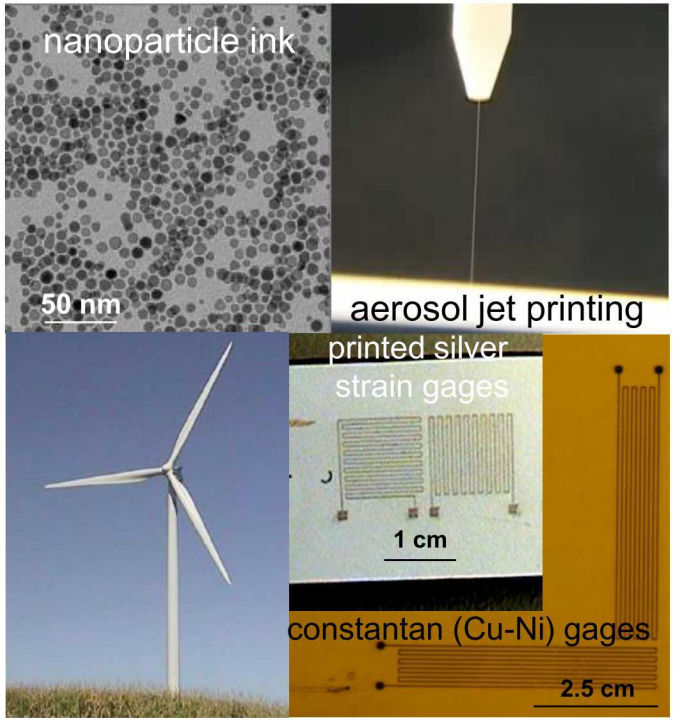
New Mexico Site:
Workforce: ~10,000
R&D employees: ~3,800
(R&D Staff & Technologists)

California Site:
Workforce : ~1,200
R&D employees: ~600
(R&D Staff & Technologists)



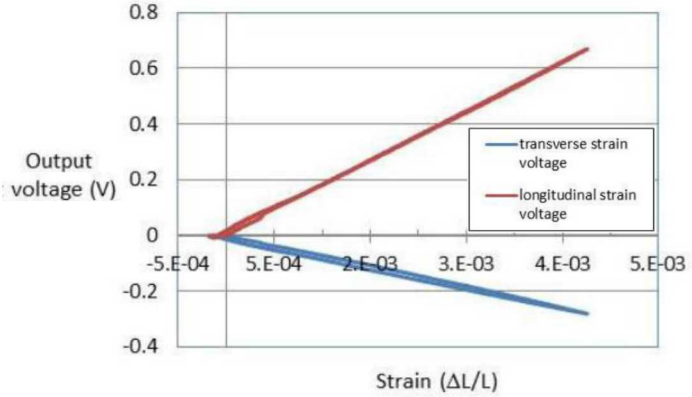
Data as of June 29 end of Q3 of the FY18

Printed Materials for Energy Generation



Printed wind turbine health monitoring:

1) Goals: turbine health/load sensing
2) Printed strain/wind load sensors
3) Wireless monitoring for operation and maintenance



Paul Clem, Adam Cook, Chris Apblett
Sandia National Laboratories

Sandia National Laboratories

OPTOMEC
Directed Material Deposition™ Solutions

DARPA

WIND POWER TECHNOLOGIES

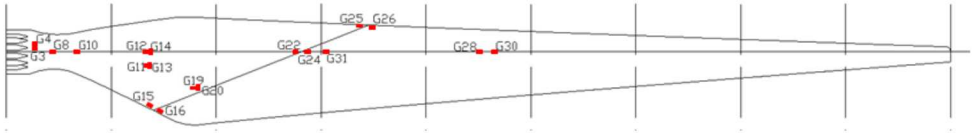
Sandia National Laboratories

GE 1.5 MW turbines, Fort Sumner, NM

45 m blade test NREL/NWTC, CO

Motivation for printed turbine sensors

Current technologies:



"Experimental Results of Structural Health Monitoring of Wind Turbine Blades," M.A. Rumsey et al. AIAA 2008

Strain

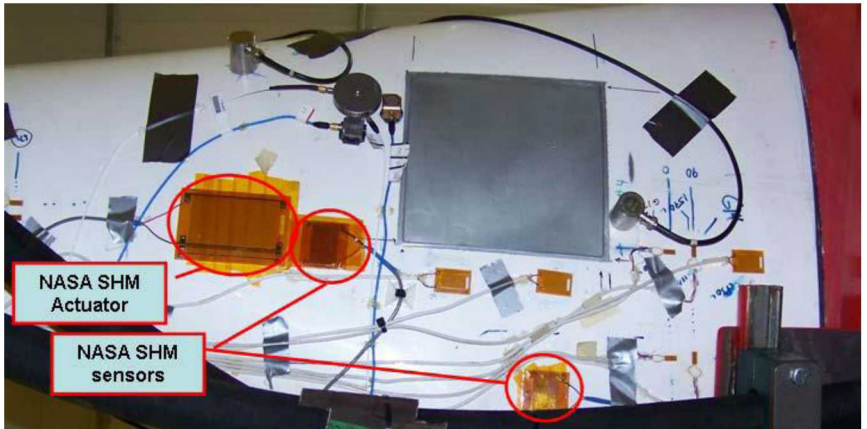
- metal foil strain gages
- Bragg grating fiber optic gages
- piezoelectric actuators/sensors

Pressure/wind speed

- Pitot sensors
- hotfilm

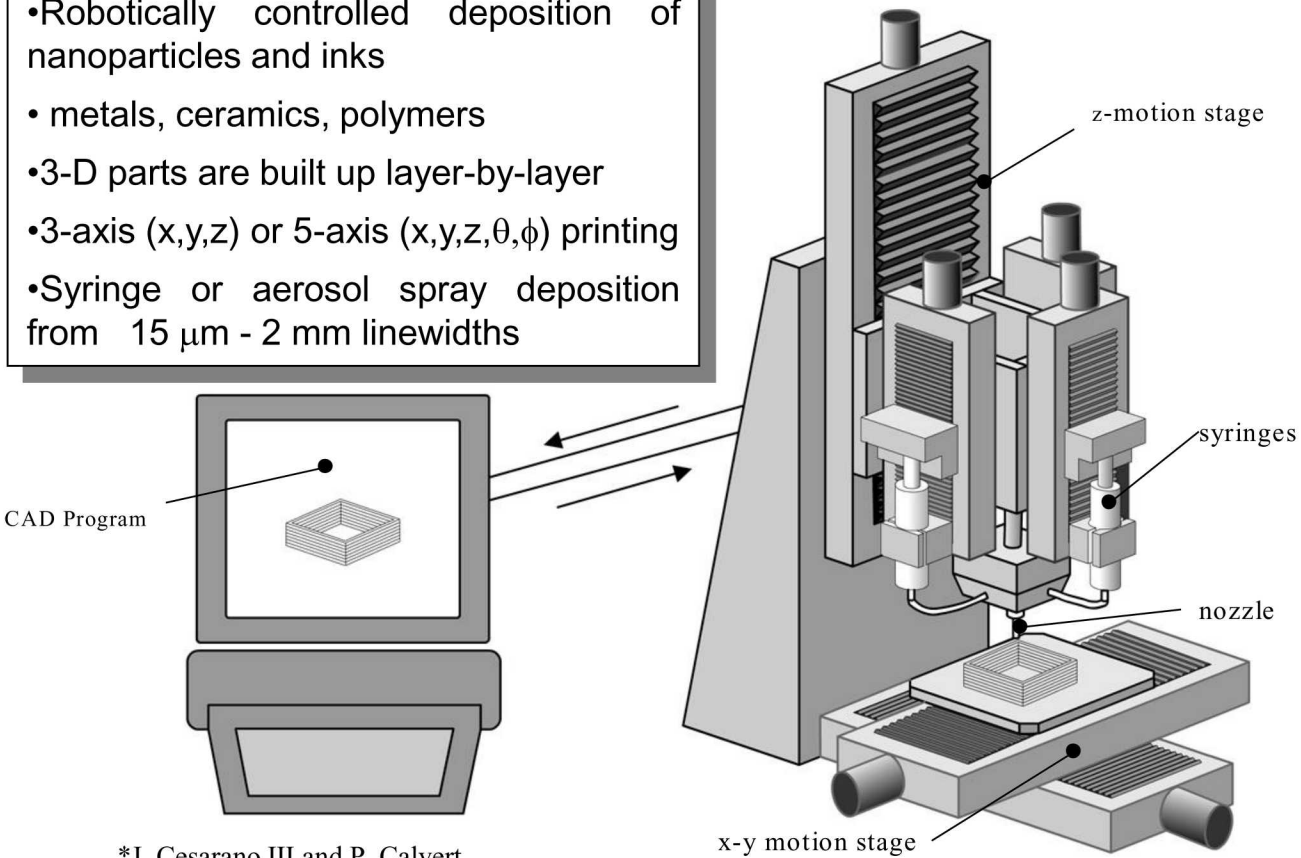
Issues:

- adhesion/reliability
- cabling/lightning
- real world data output



Sandia direct-write printing platform

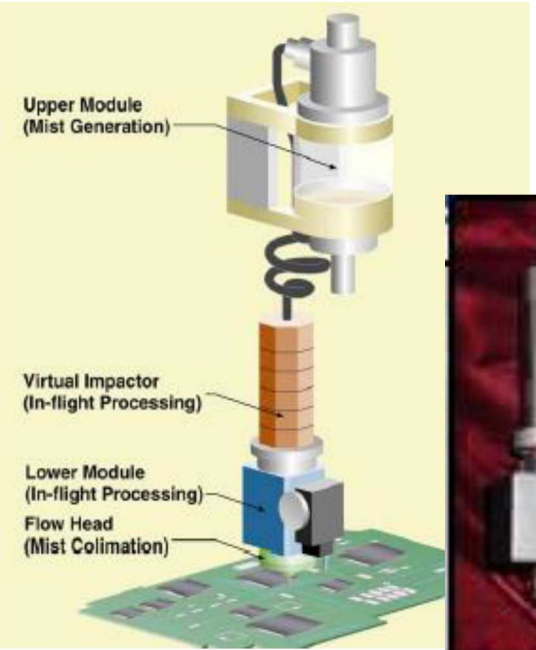
- Robotically controlled deposition of nanoparticles and inks
- metals, ceramics, polymers
- 3-D parts are built up layer-by-layer
- 3-axis (x,y,z) or 5-axis (x,y,z,θ,ϕ) printing
- Syringe or aerosol spray deposition from 15 μm - 2 mm linewidths



*J. Cesarano III and P. Calvert,
"Freeforming Objects with Low-Binder Slurry"
US *Patent No.* 6,027,326.

Sandia National Laboratories

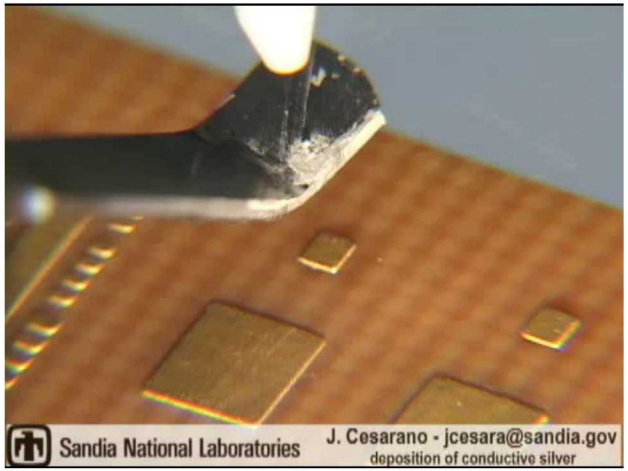
Aerosol Jet direct write method
(Optomec M^{3}D/collimated microspray)



Microspray head
(10-25 μm lines)

Process Steps:

- Mist Generation - 2-5 μm droplets
- Mist Collimation – air sheath compresses stream to 10-25 μm
- Deposition - focused mist stream prints pattern from AutoCAD file
- Final Cure - treatment to cure deposit (heating, laser, UV etc.)

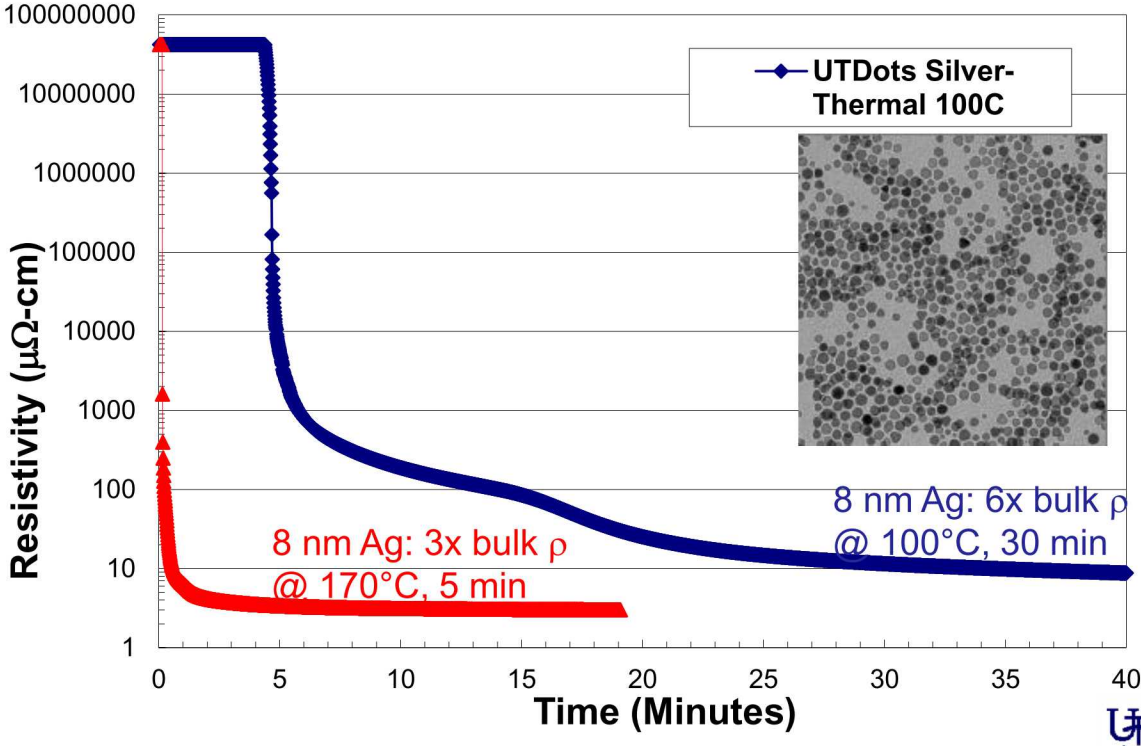


OPTOMEC™
Directed Material Deposition™ Solutions

Sandia National Laboratories

8 nm silver nanoparticle UT Dots ink

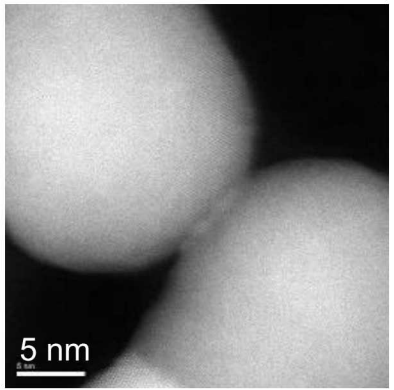
ultralow T processing (100-170°C)



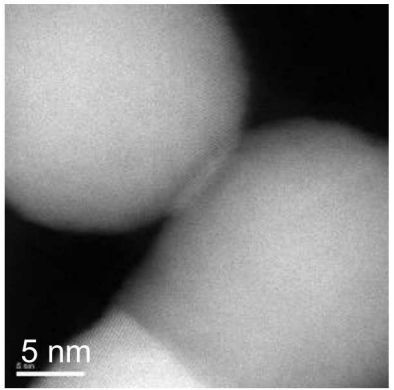
OPTOMEC™
Directed Material Deposition™ Solutions

Silver nanoparticle (25 nm) inks:
in situ TEM annealing (25-300°C)

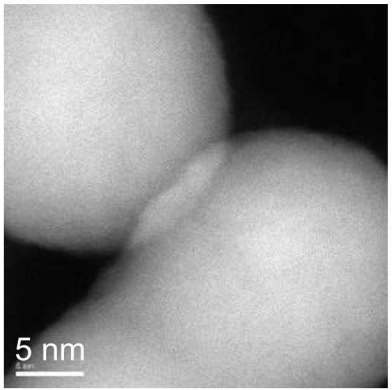
50°C



100°C

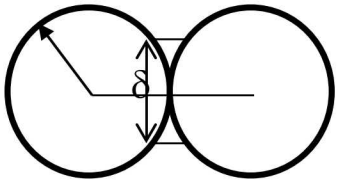


170°C



25 nm silver nanoparticles display necking beginning at 100°C

$$\sigma = A\sqrt{\delta}\ (\phi-\phi_c)^{\tau}$$

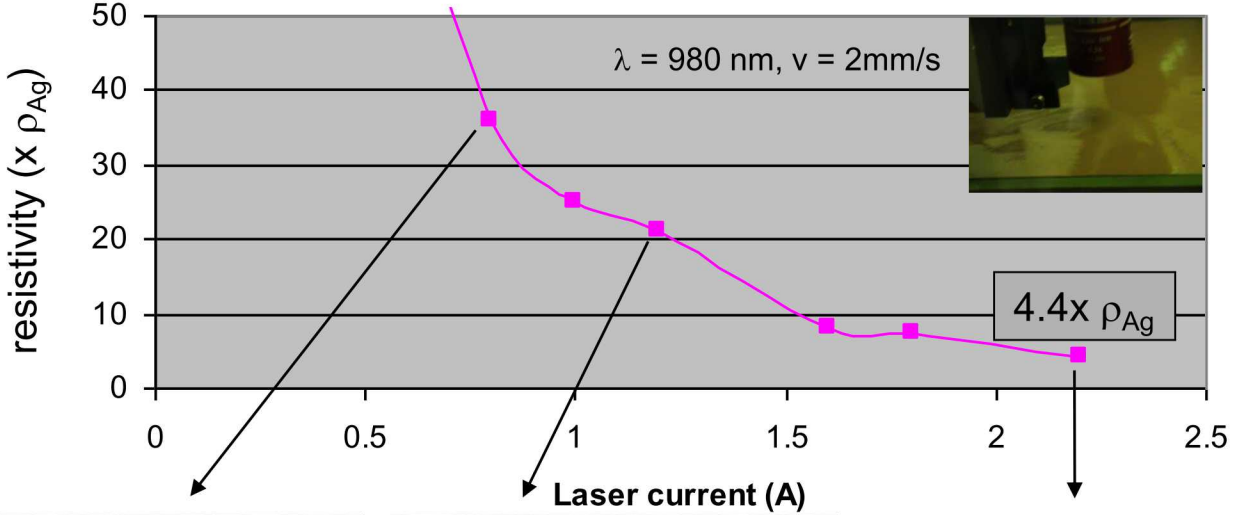


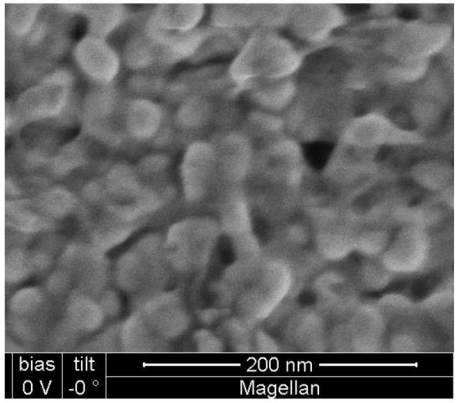
High surface mobilities and grain boundary curvatures present in nanoparticles appear to drive low temperature coarsening

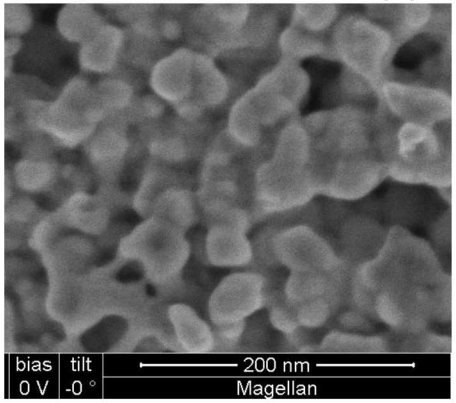
STEM Images: Prof. D. Kovar, Prof. P. Ferreira, Univ. of Texas

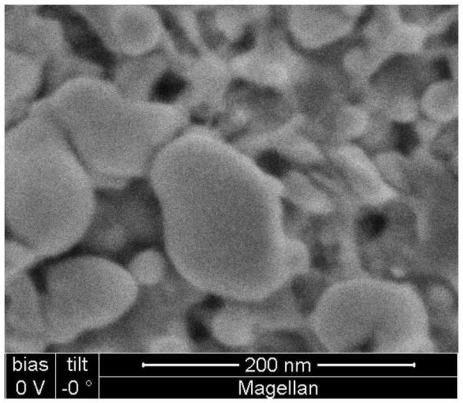
Laser sintering of 8 nm silver nanoparticle UT Dots ink

sample ambient temperature processing (25°C)





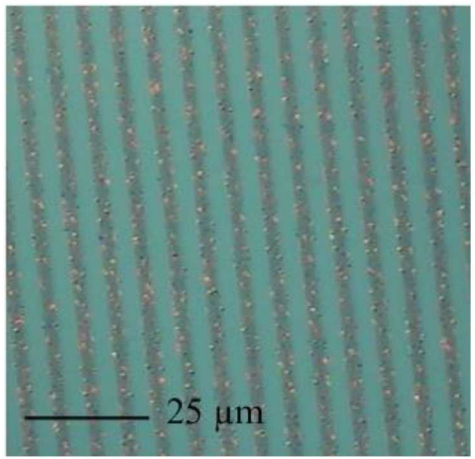


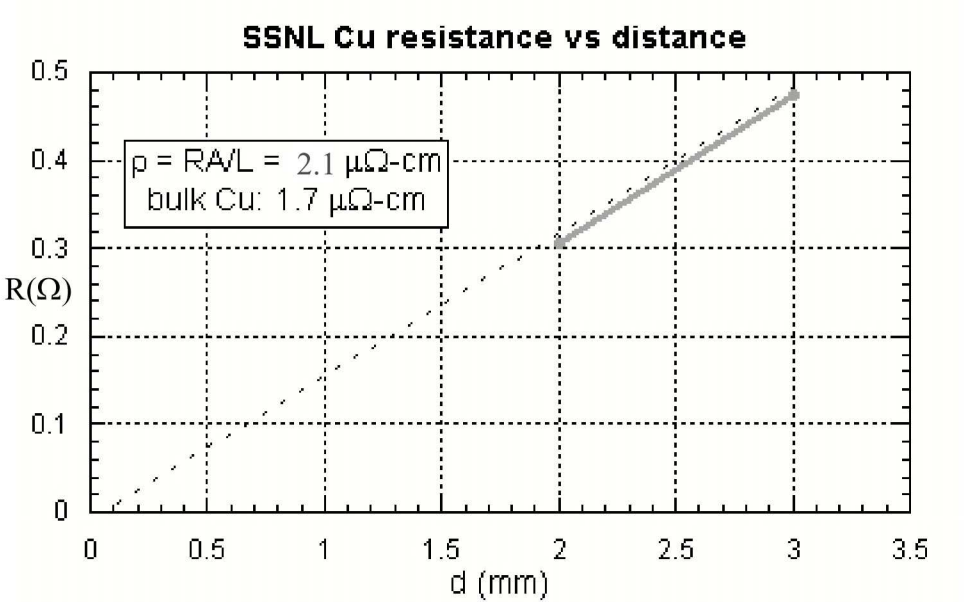


Printed 5 μm copper: 80% bulk Cu conductivity

Copper processing:

1) Cu ink decomposed in air
2) CuO reduced to Cu metal by flashlamp sintering

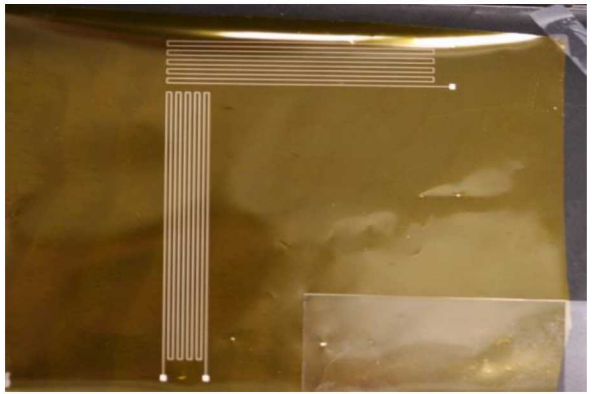




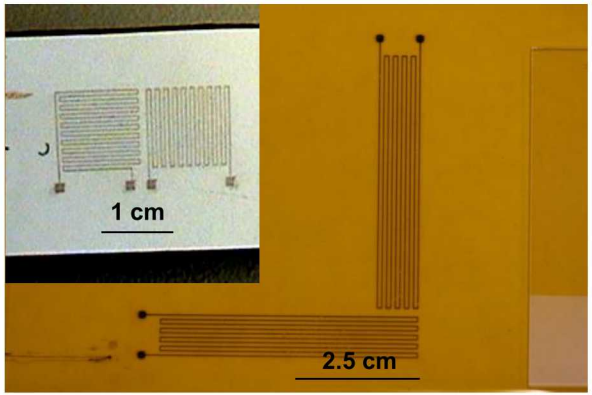
N.A. Chang, J. Richardson, P.G. Clem, and J.W.P. Hsu, "Additive patterning of conductors and superconductors by solution stamping nanolithography," Small, 2(1), 75-59 (2006).

Sandia National Laboratories

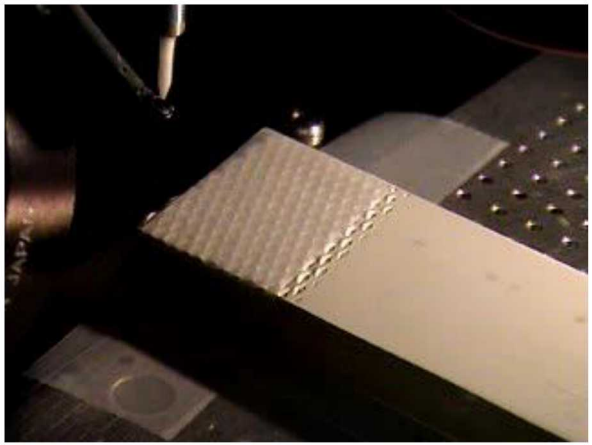
Printed silver and constantan strain gages



silver on Kapton



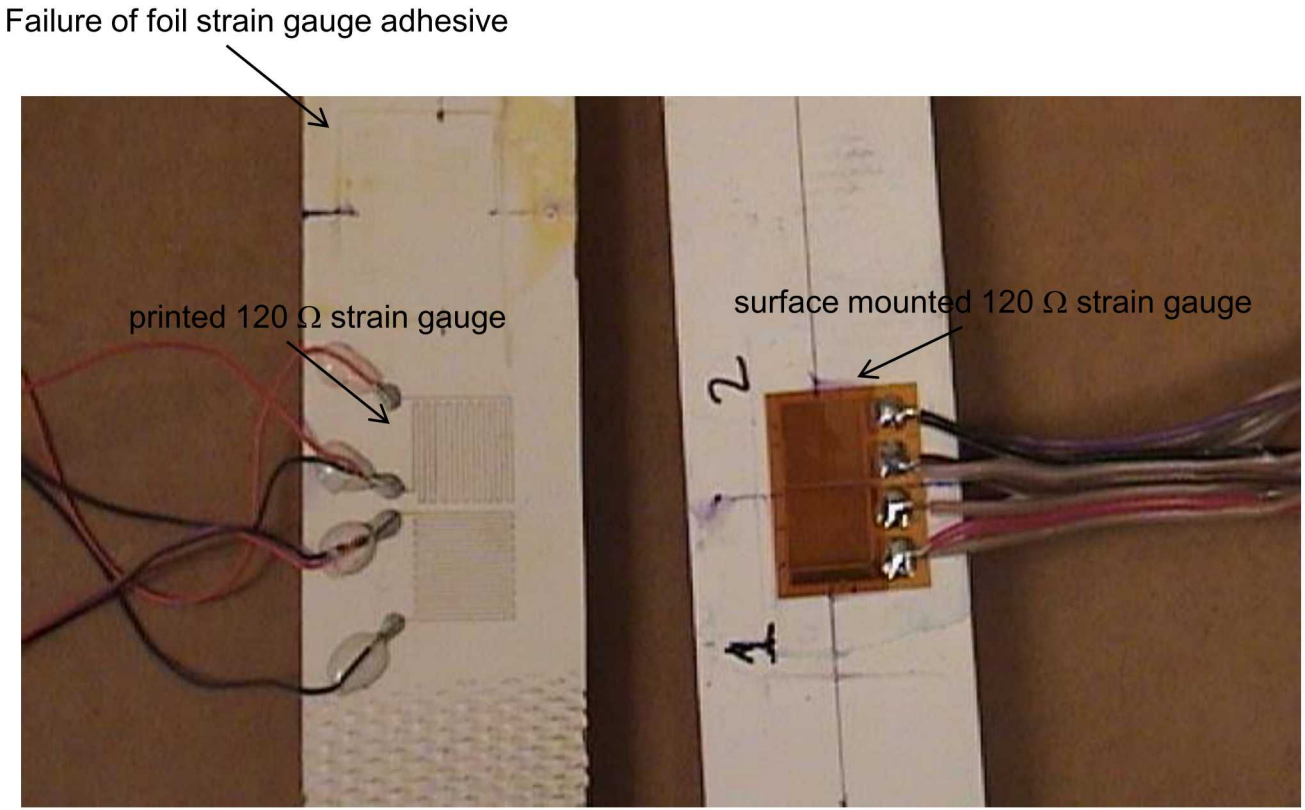
constantan on Kapton



silver on turbine blade segment

constantan on turbine blade

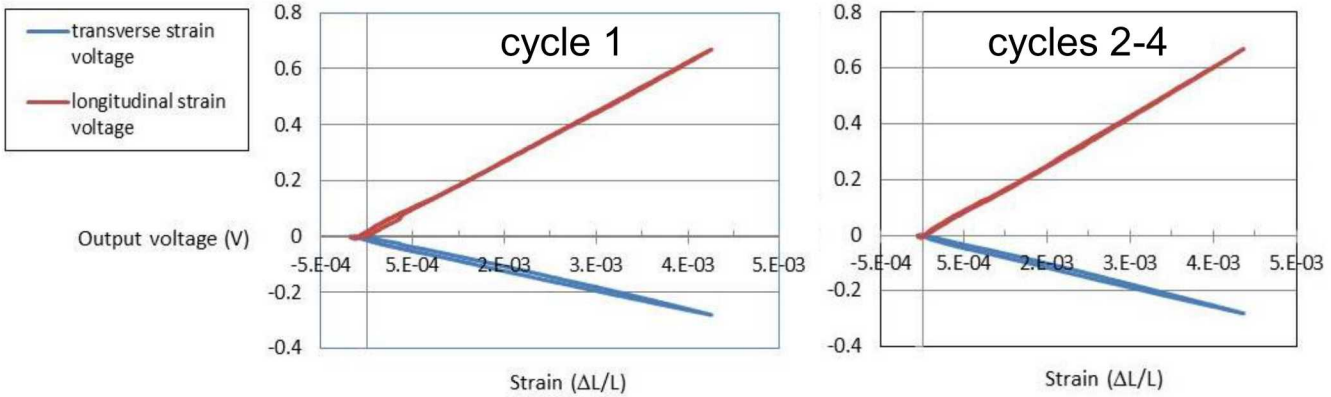
Printed silver strain gauges vs. surface mount gauges



Performance of printed 120Ω or 1000Ω strain gages

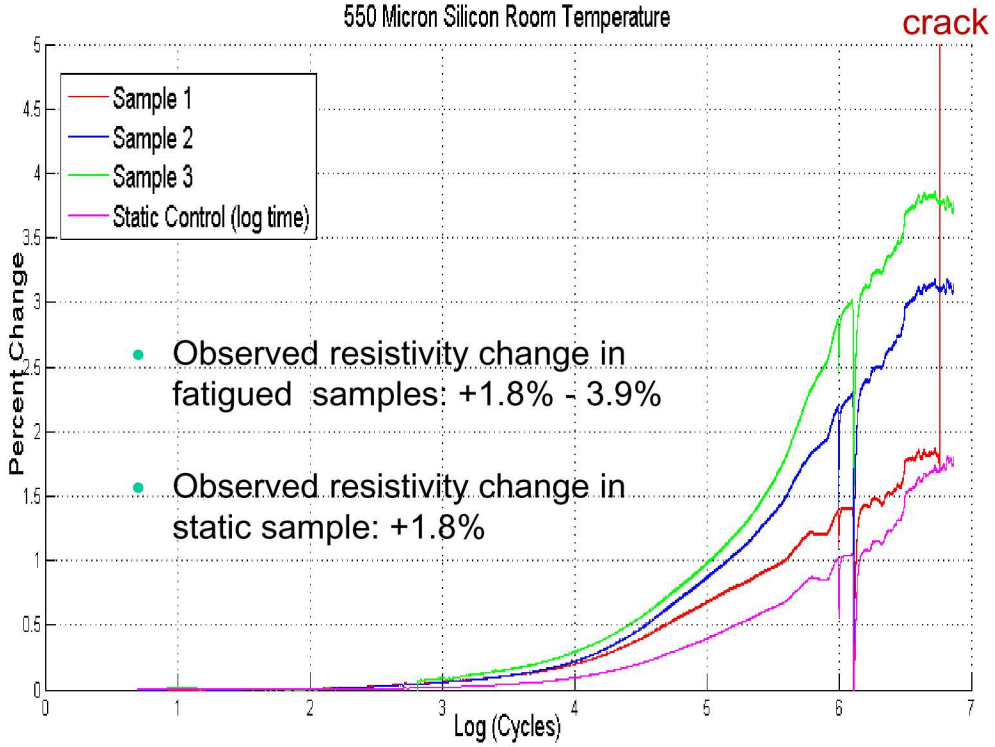
Commercial foil-based strain gages utilize a Wheatstone bridge configuration to measure both transverse and longitudinal strain, and typically use values of 120 W, 400 Ω or 1000Ω. Designs compatible with 120 Ω and 1000 Ω bridge operation were developed and printed by Adam Cook as shown in table II. The 1000 Ω samples were accurate to within 0.24% of design resistance:

Sample ID	Bridge elements	Design value	Measured resistance values
6A	1-4	1000 Ω	1000.4 Ω, 1001.2 Ω, 1001.5 Ω, 1000.3 Ω
6B	1-4	1000 Ω	1001.4 Ω, 1001.7 Ω, 1002.4 Ω, 1001.8 Ω
6C	1-2	120 Ω	122.4 Ω, 115.7 Ω



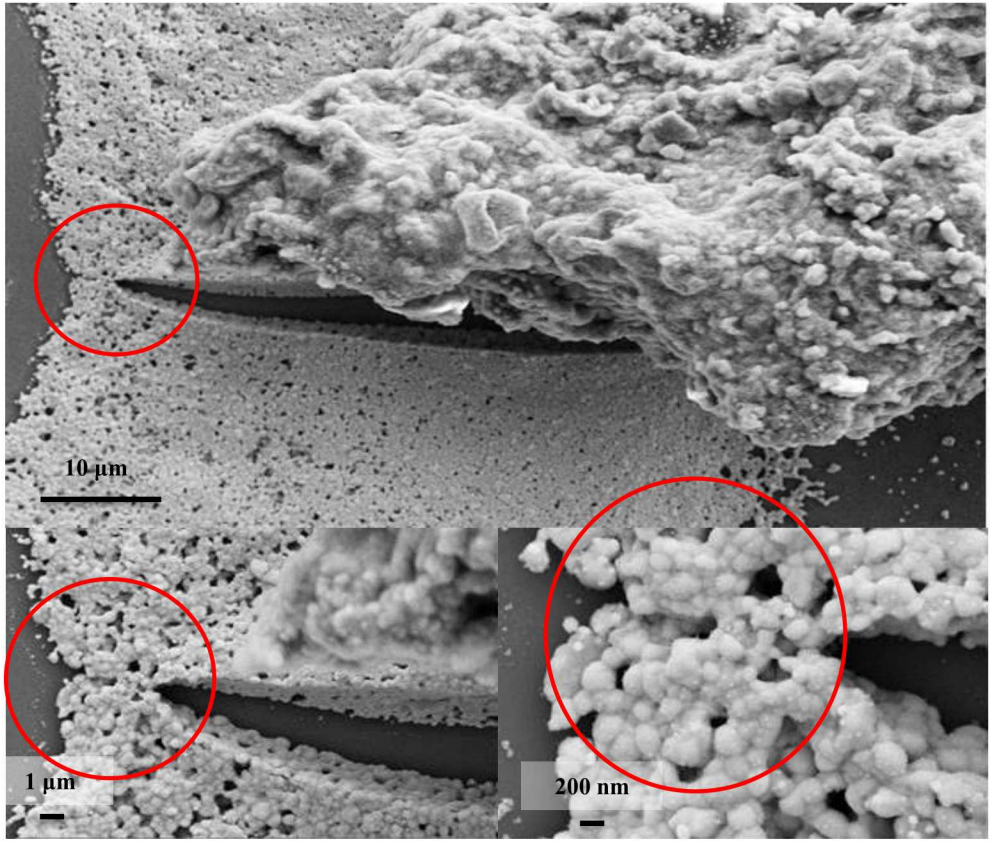
Strain gage fatigue testing to 8 million cycles

- 3 micron silver on 550 micron silicon substrate
- Test conditions: 25°C, 5 Hz, 0.1% strain, 8 million cycles



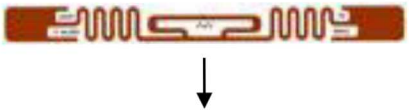
SEM of fatigue-induced crack

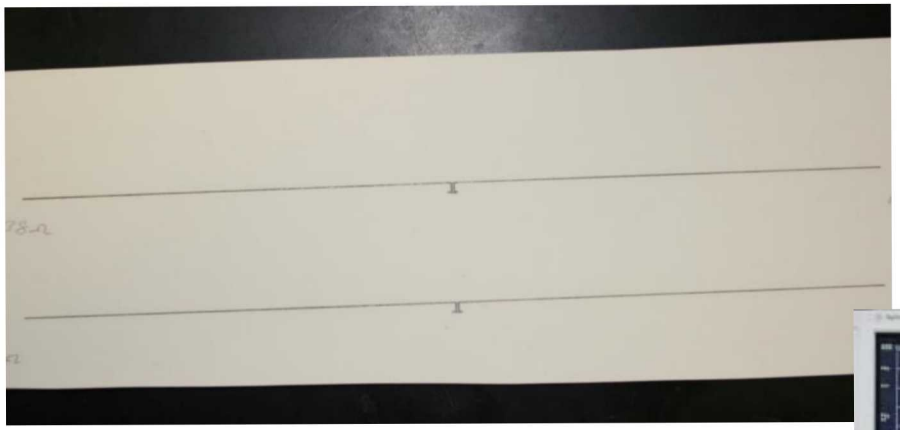
- SEM analysis verified the formation of a crack



Courtesy Bonnie Mckenzie, SNL

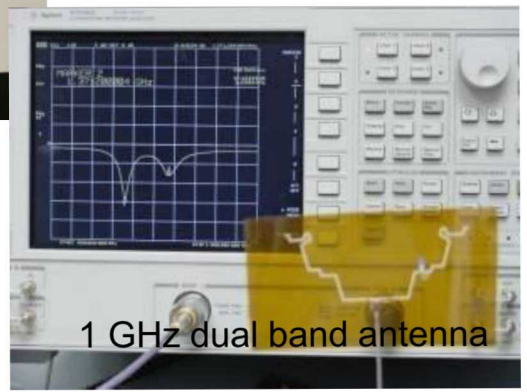
Printed flexible RFID antenna: 8 nm silver nanoparticle ink
Low temperature processing (85°C) – polymer integration





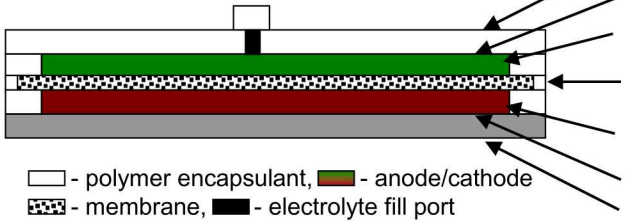
Printed antennas may be used as noncontact:

- wireless crack sensors
- delamination sensors (Δ capacitance)
- strain sensors (low modulus substrates)

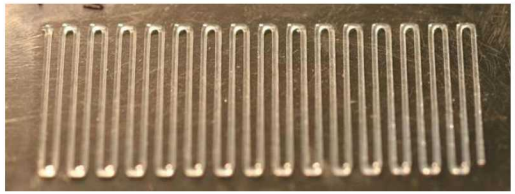


1 GHz dual band antenna

Direct Written $LiFePO_4$ Battery Anatomy

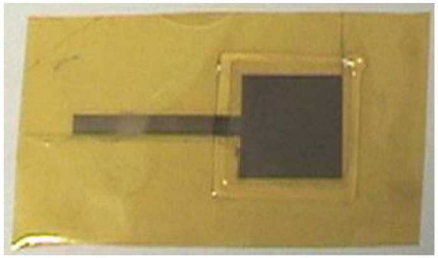


Encapsulant (DW UV-curable epoxy) ✓
Current collector (DW carbon ink) ✓
Anode (DW graphite/carbon) ✓
Separator (DW mesoporous polymers) ✓
Cathode (DW $LiFePO_4$) ✓
Current collector (DW carbon, copper inks) ✓
Substrate (polyimide ✓, low T polymers ✓)

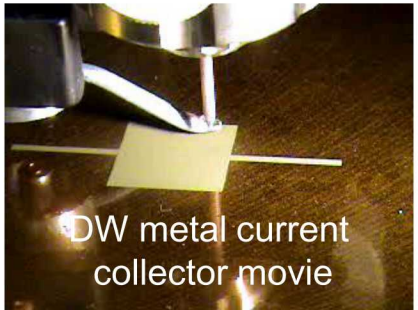


Direct written epoxy encapsulant

DW $LiFePO_4$ on copper current collector



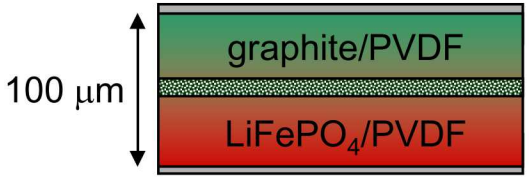
DW cathode + encapsulant on Kapton



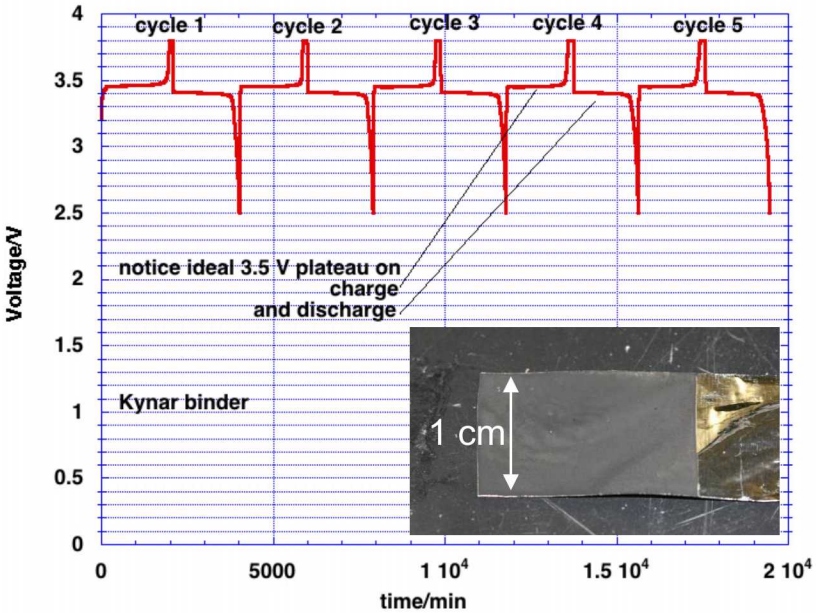
Printed 2D lithium ion battery

Printing topology:

- $LiFePO_4$/graphite/PVDF
- porous separator
- graphite/PVDF
- $LiPF_6$ liquid electrolyte



107 mA-h/g, 1.5 mA-h
printed $LiFePO_4$ cell



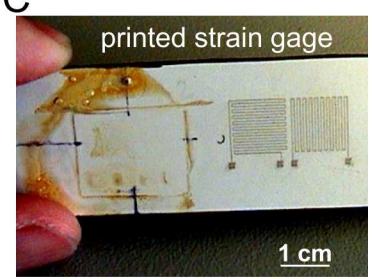
- cell energy density is 76% of theoretical capacity (140 mA-h/g)
- no electrochemically active materials (0-4 V) may be used in cell printing

Conclusions and Future Work

- Printed materials have unique energy applications
  - Sensors: strain gages, thermocouples, antennas
  - Silver and constantan strain gages on composite blade sections
  - Efficient supported catalysts, solarthermal fuel generation

- Metal nanoparticles laser/flash lamp sintered at 25°C are compatible with composite blades
  - Apply sensors to buried layers & ply drops
  - Developing pressure/flow sensors, crack sensors
  - Portable printing of sensors
  - Wireless state of health data transfer
    - Power: printed lithium batteries
    - Antennas successfully printed
    - Wireless sensors (anemometers) in development

- Niche energy applications:
  - Heterogeneous, multimaterial integration
  - Graded, optimized structures

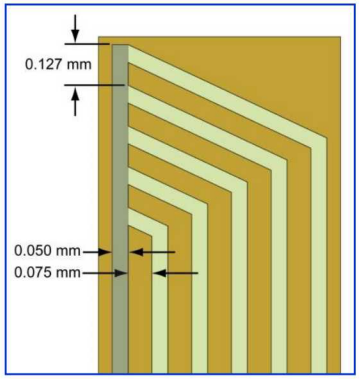


Sandia National Laboratories

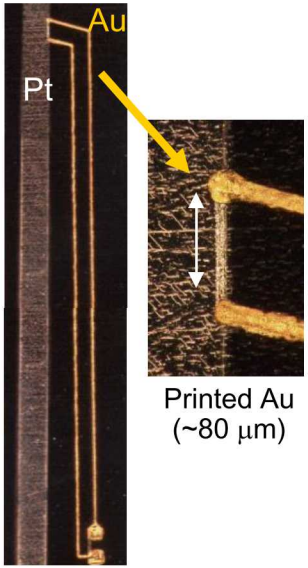
Sandia is a multiprogram laboratory operated by Sandia Corp., a Lockheed Martin company, for the US DOE, under contract DE-AC04-94AL85000

Printed Au/Pt thermocouples

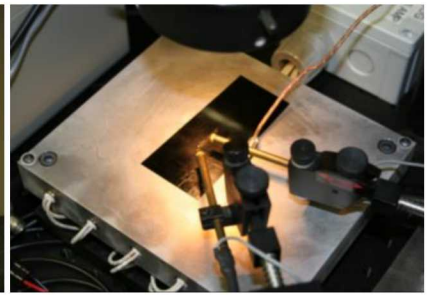
- Pt/Au bimetal junction thermocouples with two temperature sensing junctions were printed.
  - Common Pt ground
  - Printed Au to form junctions
    - 8-nm Au nanoparticles in solvent
    - laser-cured after printing.

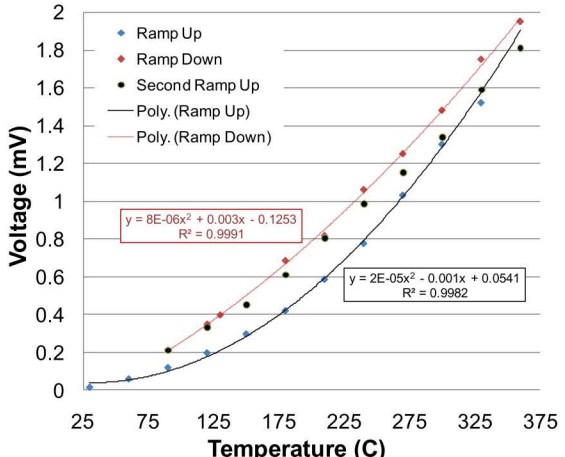


Prototype TC Probe
with 5 junctions
(1 mm separation)



Printed Au
(~80 μm)





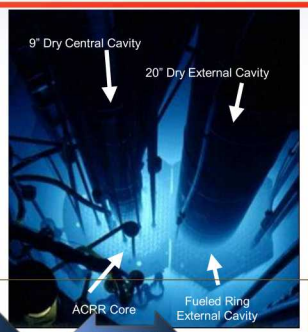
Sandia's USER Capabilities

Core Facility - SNL

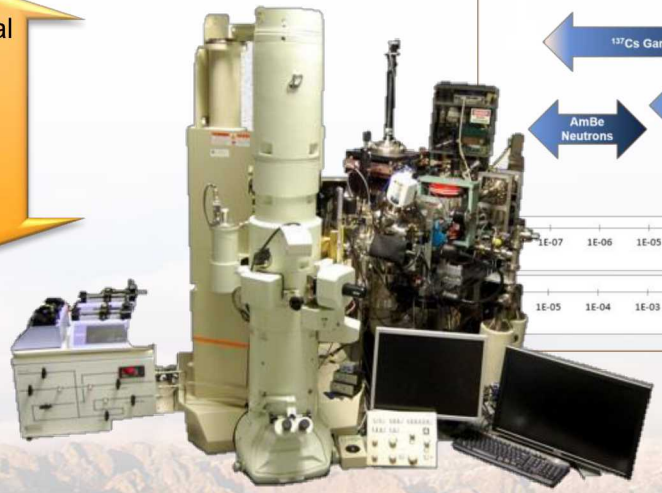
Center for Integrated Nanotechnologies
DISCOVERY PERFORMANCE EDUCATION INTEGRATION
CINT
Sandia Los Alamos

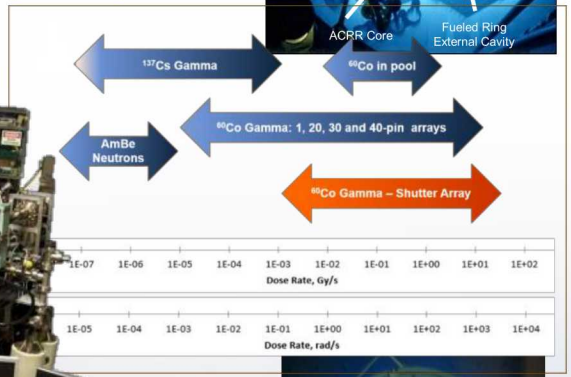
NSUF Nuclear Science User Facilities

D. Hanson, W. Martin, M. Wasiolek

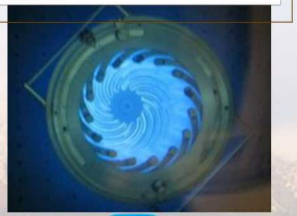


- Nanophotonics & Optical Nanomaterials
- Soft- Biological & Composite Nanomaterials
- Quantum Materials
- In-situ Characterization and Nanomechanics





Gateway Facility - LANL

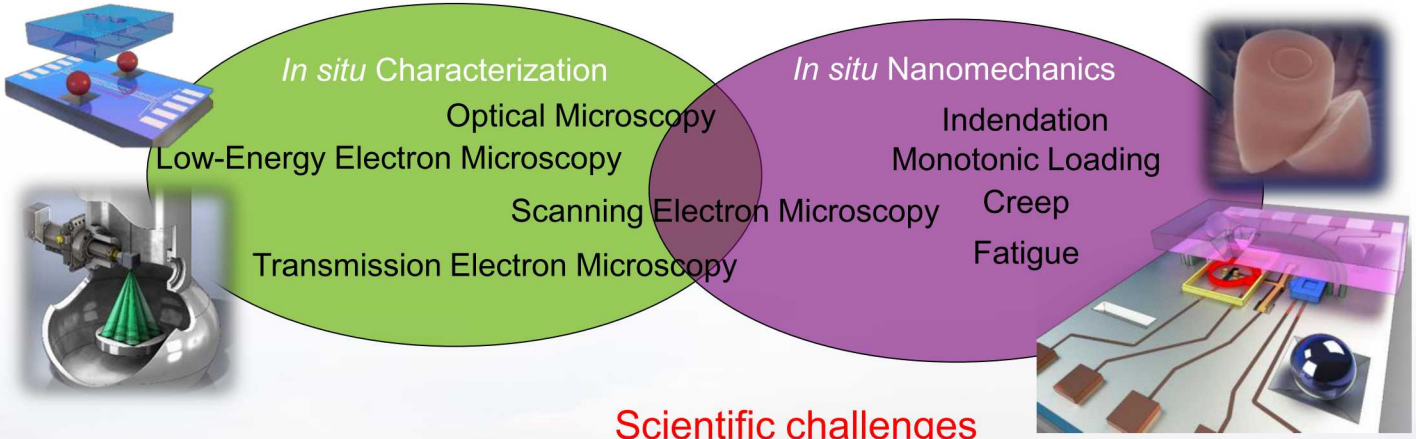


Sandia National Laboratories is a multi-mission laboratory managed and operated by National Technology and Engineering Solutions of Sandia, LLC., a wholly owned subsidiary of Honeywell International, Inc., for the U.S. Department of Energy's National Nuclear Security Administration under contract DE-NA0003525.

Sandia National Laboratories

In situ Characterization and Nanomechanics

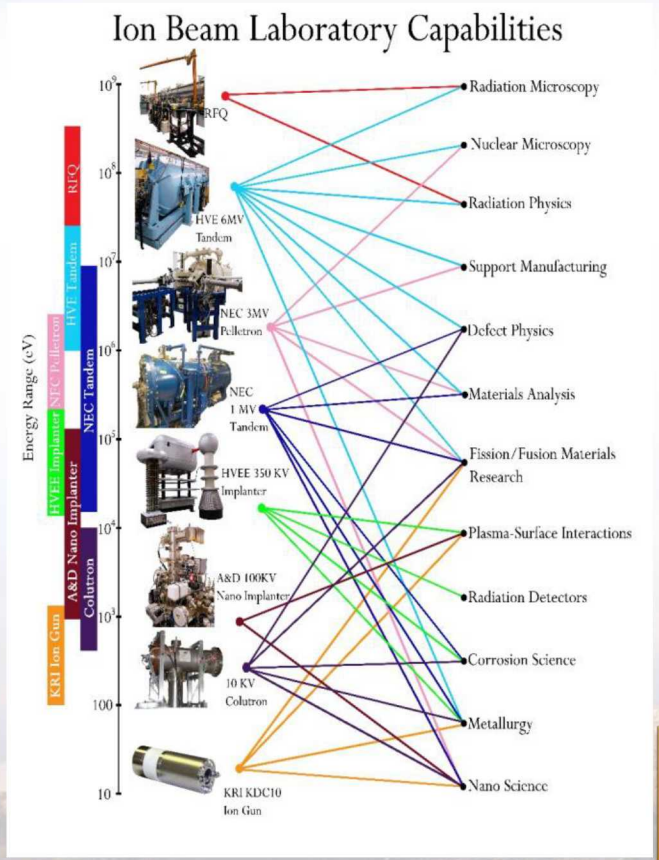
Developing and implementing world-leading capabilities to study the dynamic response of materials and nanosystems to mechanical, electrical, or other stimuli.



Scientific challenges

- How do defects and crystal distortions alter the mechanical and other extrinsic properties in nanostructured materials?
- How can we understand and control energy transfer across interfaces and over multiple length and time scales?
- How does the environment change the mechanical response and surface structure of nanoscale materials?

Sandia's Ion Beam Laboratory

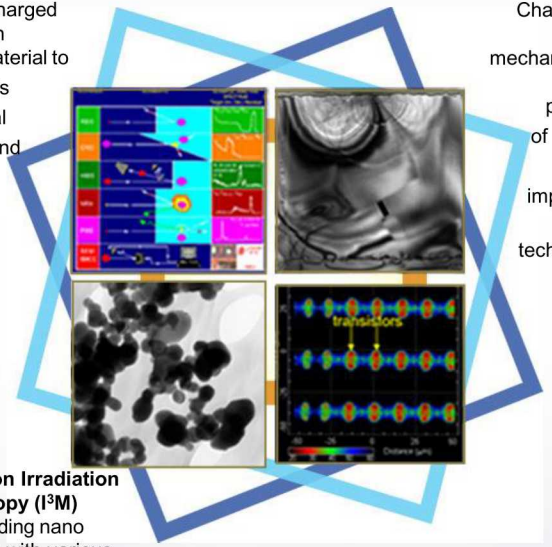


Ion Beam Analysis (IBA)

Shooting a charged particle at an unknown material to determine it's identity, local chemistry, and structure.

Ion Beam Modification (IBM)

Changing the optical, mechanical, and chemical properties of materials via ion implantation to meet technological needs



***In Situ* Ion Irradiation Microscopy (I^3M)**

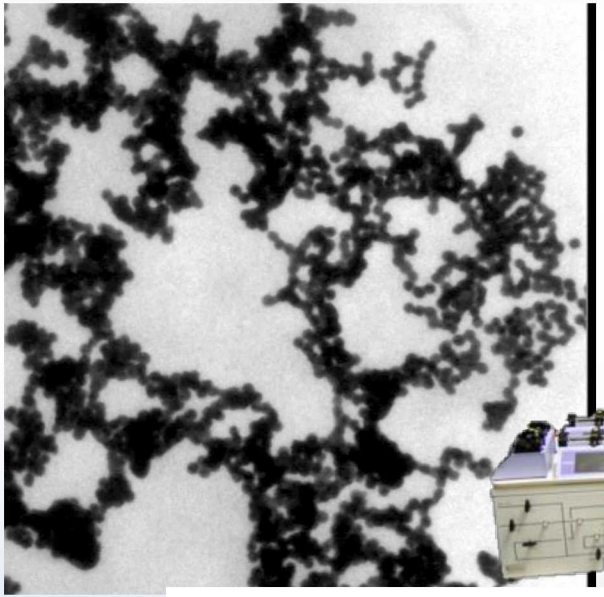
Bombarding nano samples with various particles and observing the changes in real time to understand how materials will behave in extreme environments.

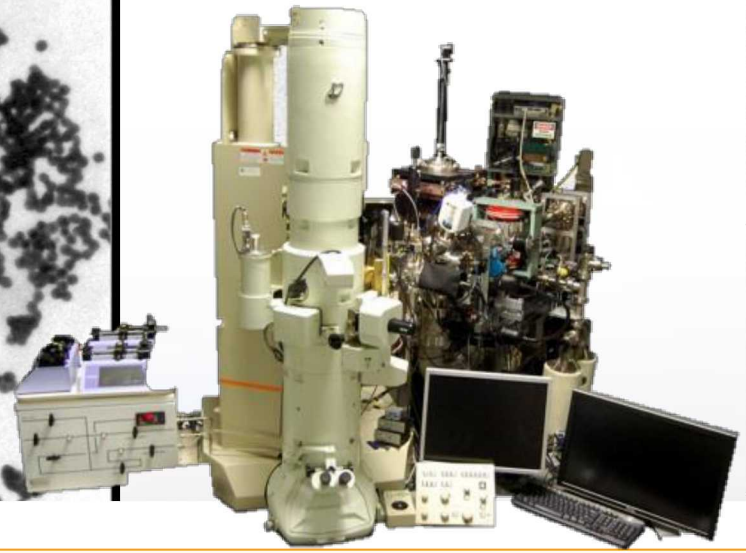
Radiation Effects Microscopy (REM)

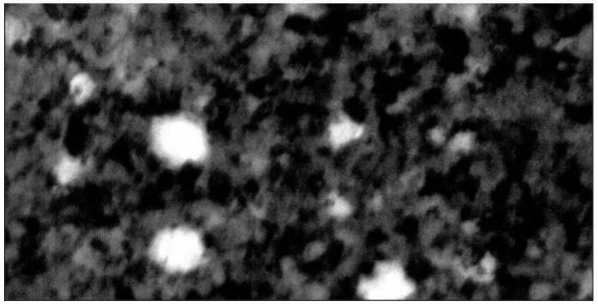
Using ion emissions to determine the Radiation hardness of microelectronics, identifying potential weaknesses.

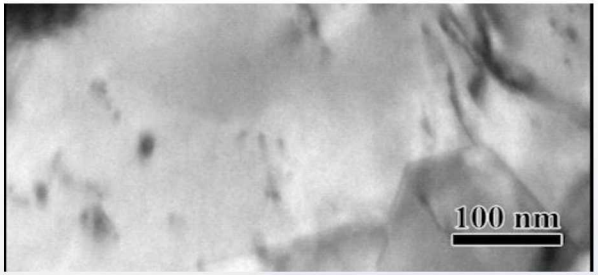
The IBL has a unique and comprehensive ion beam capability set including and *In situ* Ion Irradiation Transmission Electron Microscopy.

The Response of Metals to Extreme Environments









Collaborators:

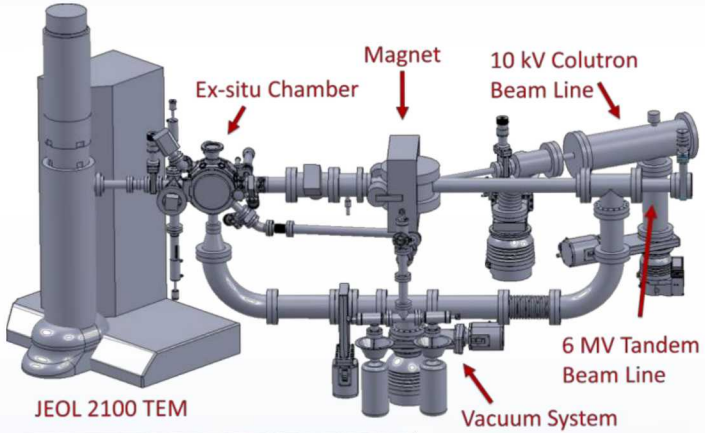
- D.L. Buller, D.C. Bufford, S.H. Pratt, T.J. Boyle, B.A. Hernandez-Sanchez, S.J. Blair, B. Muntifering, C. Chisholm , P. Hosemann, A. Minor, J. A. Hinks, F. Hibberd, A. Ilinov, D. C. Bufford, F. Djurabekova, G. Greaves, A. Kuronen, S. E. Donnelly, K. Nordlund, F. Abdeljawad, S.M. Foiles, J. Qu, C. Taylor, J. Sugar, P. Price, C.M. Barr, D. Adams, M. Abere, L. Treadwell, A. Cook, A. Monterrosa, IDES Inc, J. Sharon, B. L. Boyce, C. Chisholm, H. Bei, E.P. George, W. Mook, Hysitron Inc., G.S. Jawaharram, S. Dillon, R.S. Averback, N. Heckman, J. Carroll, S. Briggs, E. Carnes, J. Brinker, D. Sassaki, T. Nenoff, B.G. Clark, P.J. Cappillino, B.W. Jacobs, M.A. Hekmaty, D.B. Robinson, L.R. Parent, I. Arslan. & Protochips, Inc.

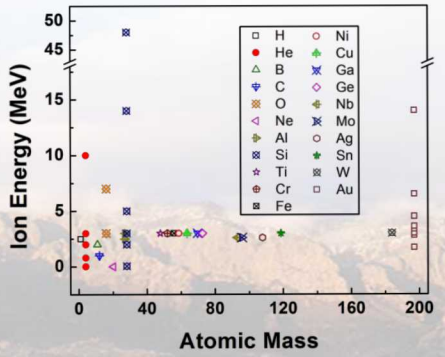
This work was partially funded by the Division of Materials Science and Engineering, Office of Basic Energy Sciences, U.S. Department of Energy. Materials Science and Engineering, Office of Basic Energy Sciences, U.S. Department of Energy. This work was performed, in part, at the Center for Integrated Nanotechnologies, an Office of Science User Facility operated for the U.S. Department of Energy (DOE) Office of Science. 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. DOE's National Nuclear Security Administration under contract DE-NA-0003525. The views expressed in the article do not necessarily represent the views of the U.S. DOE or the United States Government.

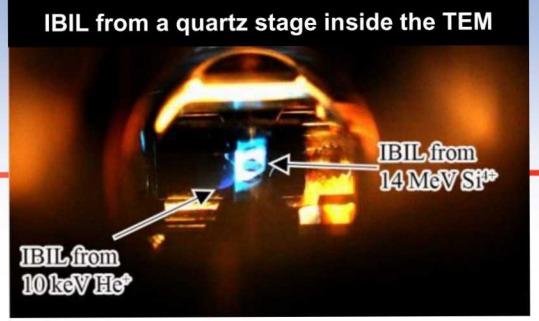
Sandia's Concurrent *In situ* Ion Irradiation TEM Facility

10 kV Colutron - 200 kV TEM - 6 MV Tandem

Collaborator: D.L. Buller



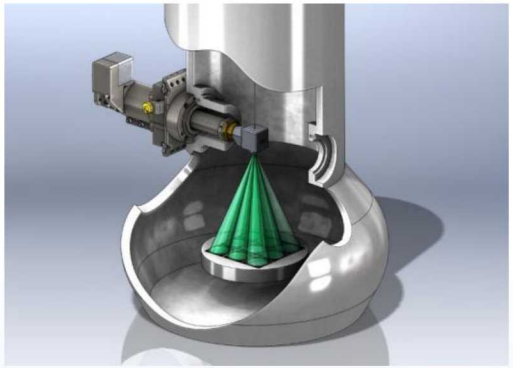




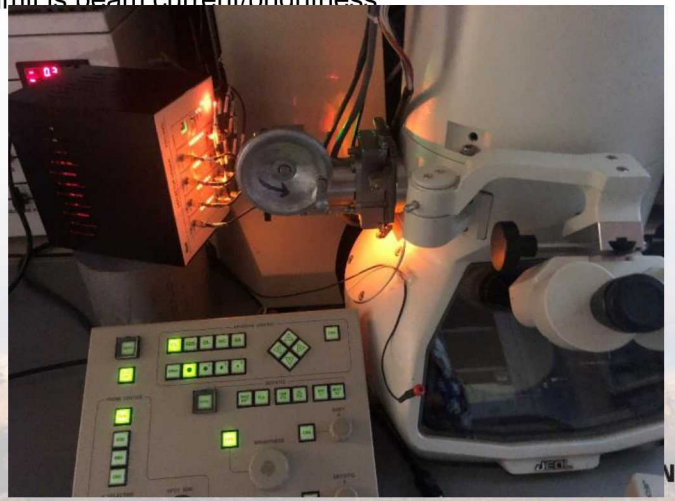
μs Resolution with a Standard Camera

Collaborator: P. Price, A. Monterrosa, D. Adams, M. Abere, & IDES Inc.

fs ps ns **µs** **ms** s



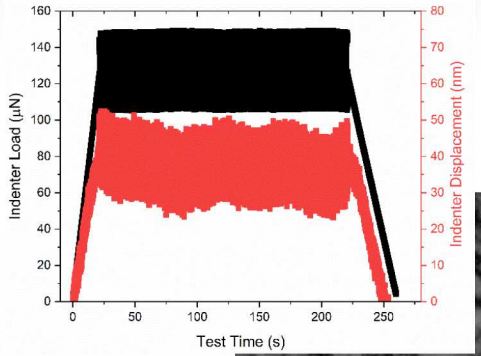
- **Electrostatic deflection of electrons**
- **4, 9, or 16 images per frame, spread over a large camera**
- **Any exposure time up to the limits of the camera**
  - Ultimate limit is beam current/brightness



National Laboratories

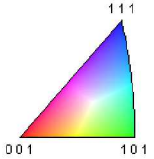
Cyclic Loading Coupled with ACOM

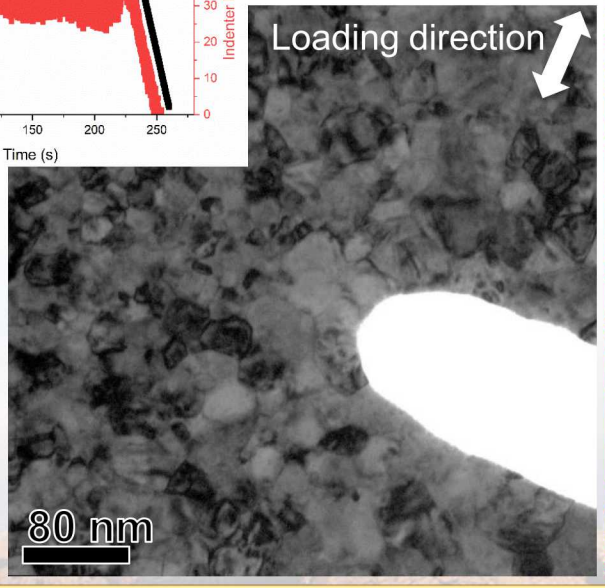
Collaborators: C. Barr & W. Mook

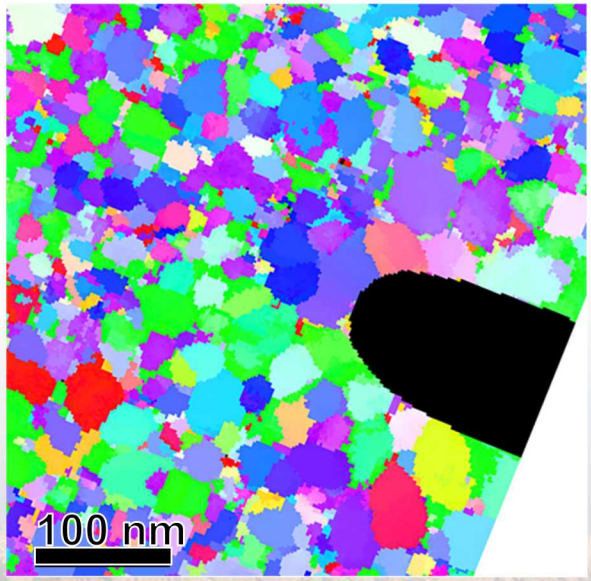


Mean load (P_{mean}) = 135 uN

Amplitude load (P_{amp}) = 35 uN



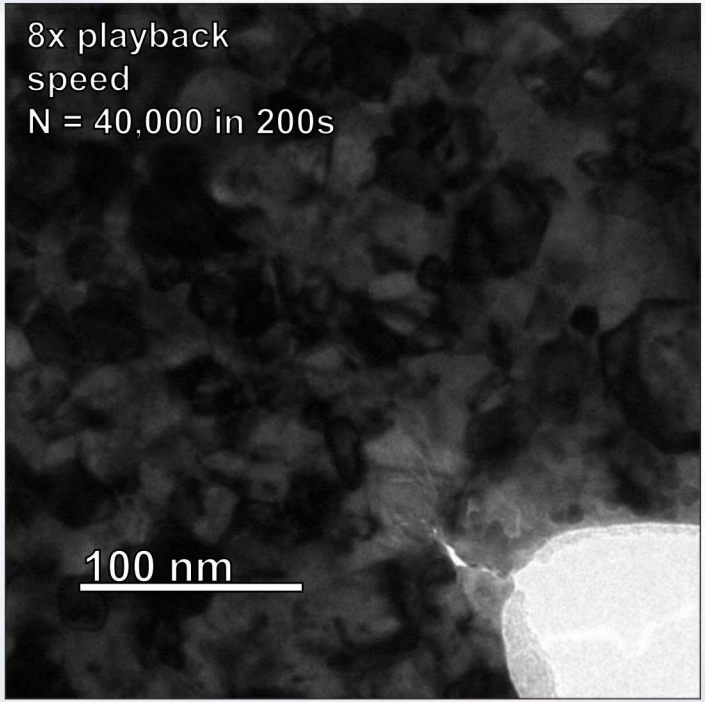


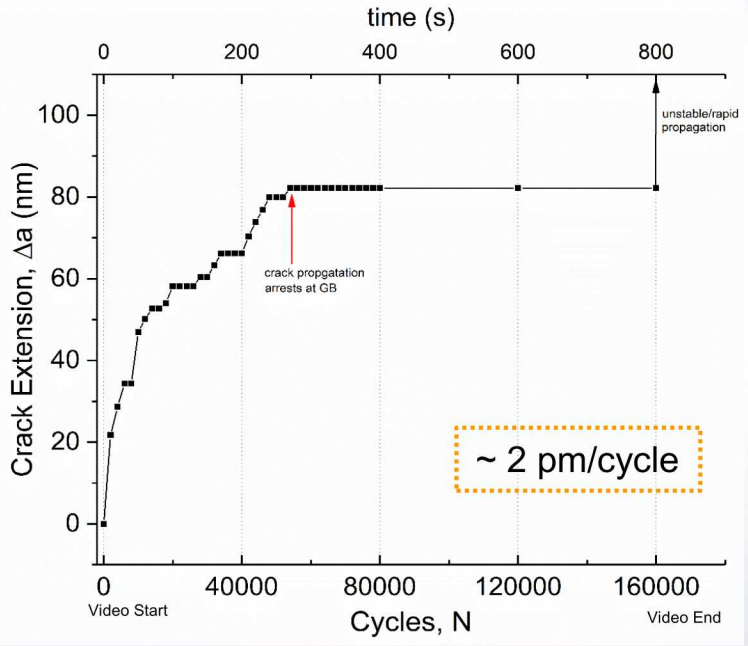


Orientation maps pre-, intermediate, and post- in-situ mechanical test can assist in deconvoluting possible mechanisms during cyclic loading

Cyclic Loading: Complex Crack Propagation

Collaborators: C. Barr & W. Mook





- Mean load: 135 uN; Amplitude load: 35 uN
- 200 Hz, 200s test (15 fps 1k x 1k camera)

- da/dN = 1.7 x 10^{12} m/cycle
- Non-linear crack extension rate
- Crack propagation path changes "direction"

Working at Sandia

The Work Experience

- Have meaningful & challenging work assignments
- Work in state-of-the-art research facilities
  Take a Virtual Tour @ tours.sandia.gov
- Work with top minds
- Join outreach and networking groups
- Receive award recognitions,
  like R&D 100 Awards *and more*
- Take a leave to pursue qualifying research and professional opportunities
- Receive patent royalties, if eligible
- Experience a career path in various areas at Sandia

Quality of Work-Life

Flexible Work Schedules

- 9/80 & 4/10 – workweek
- Generous Paid Time Off
- 11 paid holidays – includes a winter shutdown at the end of each calendar year
- Telecommuting arrangements
- Part-time options
- Vacation Buy Plan

Family Life

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

Convenience

- 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

Health & Benefits

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

Living in Albuquerque

Watch:
Sandia New Mexico Video

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 compared to larger cities

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 Fiesta
- Explore Indian pueblos and our Hispanic heritage
- Green chile – NM Cuisine
- Museums, Parks, Sports

Photo Credit:
MarbleStreetStudio.com

Living in Livermore

Watch:
Sandia California Video

Life in Livermore

- Livermore's relaxed lifestyle populates nearly 90,000
- 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

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

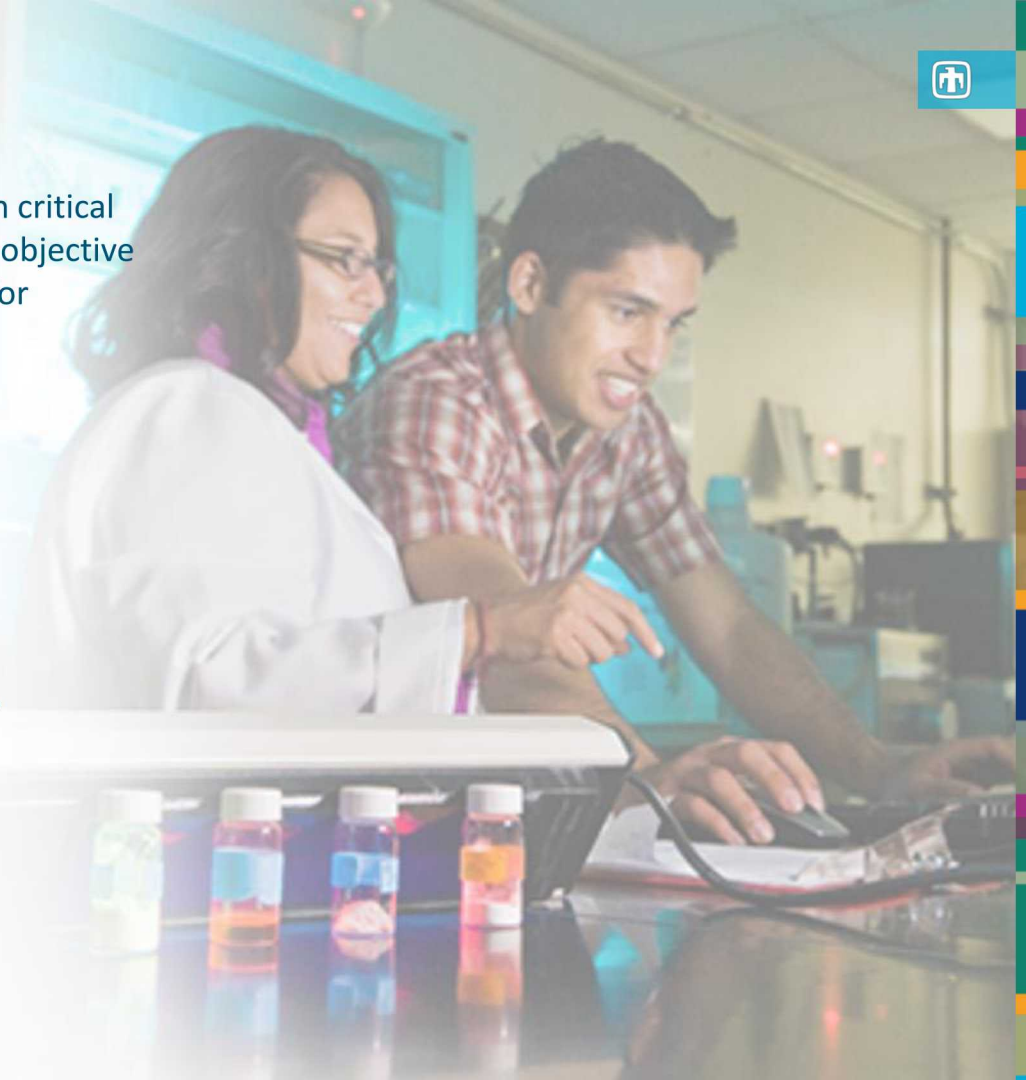
Employment Opportunities

Internships

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 (3.0 Undergrad/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



Post-doc Opportunities

Key areas for post-docs at Sandia:

- Computer science/Computer Engineering
- Electrical Engineering
- Mechanical Engineering
- High-performance computing
- Microelectronics and microfluidics
- Nanotechnology
- Physics
- Chemistry/ Electro Chem
- Biosciences and biotechnology
- Radiation & electrical sciences
- Engineering sciences
- Pulsed power sciences
- Materials science & engineering

Eligibility Criteria

- A recent PhD (conferred 5 years prior to employment) or the ability to complete all PhD requirements before hire date.

Fellowship Opportunities

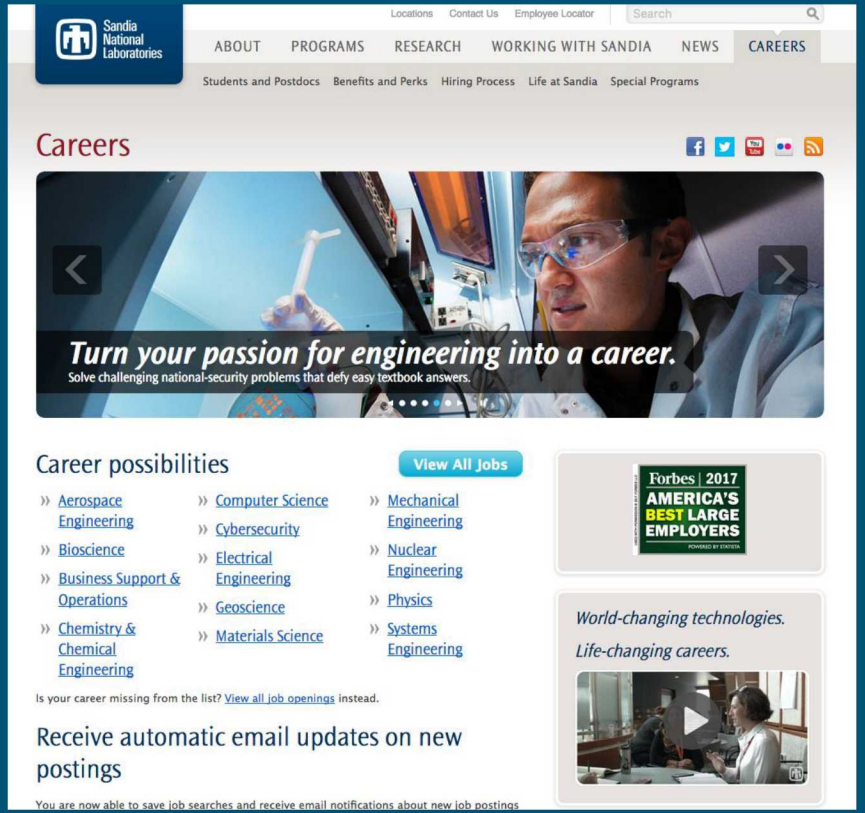
Sandia provides postdoctoral fellows with professional development opportunities and prepares fellows to conduct independent, groundbreaking research.

Postdoctoral Fellowships

- Harry S. Truman Fellowship
- Jill Hruby Fellowship
- John Von Neumann

**Sign up for Automated Job Notifications!*

Apply Online! sandia.gov/careers



Sign up for Automated Job Notifications!

Mobile Job Applications

Thank You!

Backup Slides

Sandia California - *Livermore*

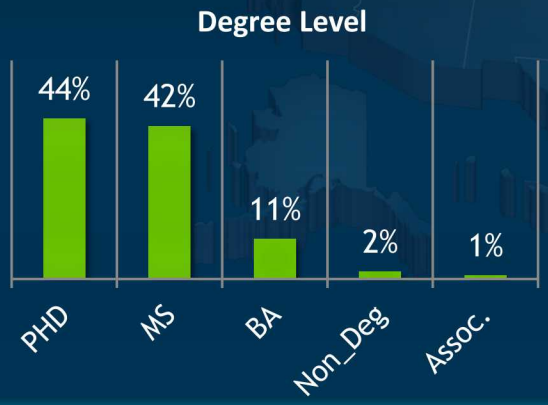
On-site workforce: ~1,200

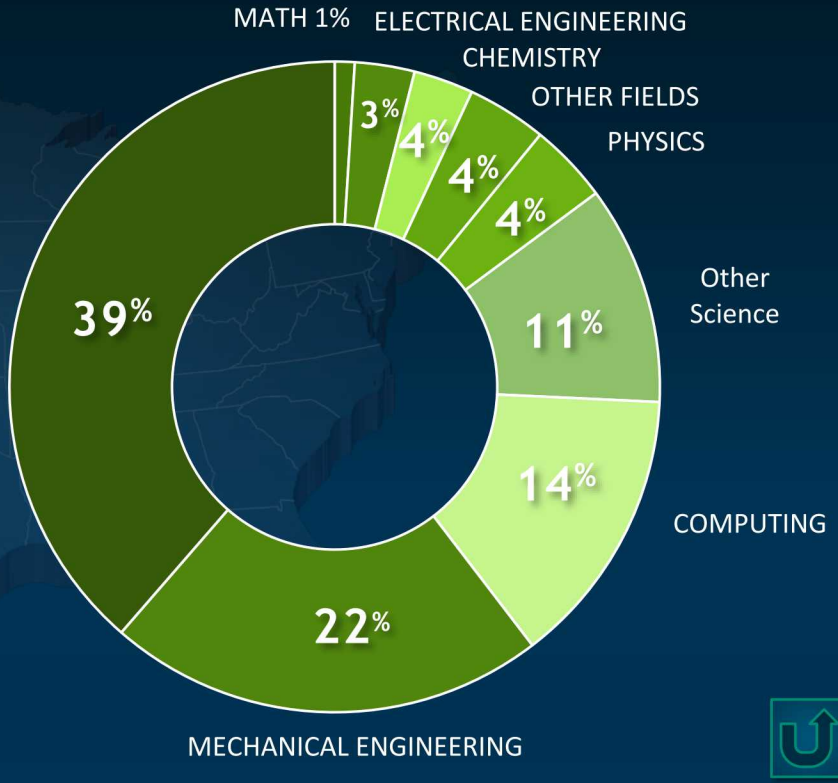
R&D staff: ~600

(excluding R&D Tech)

Distinguishing research capabilities:

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





Data as of June 29 end of Q3 of the FY18

Sandia New Mexico - *Albuquerque*

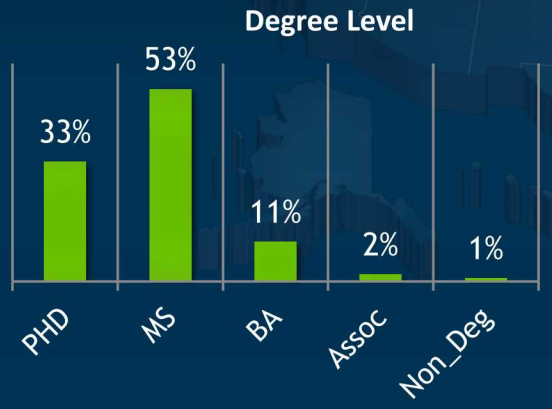
On-site workforce: ~10,000

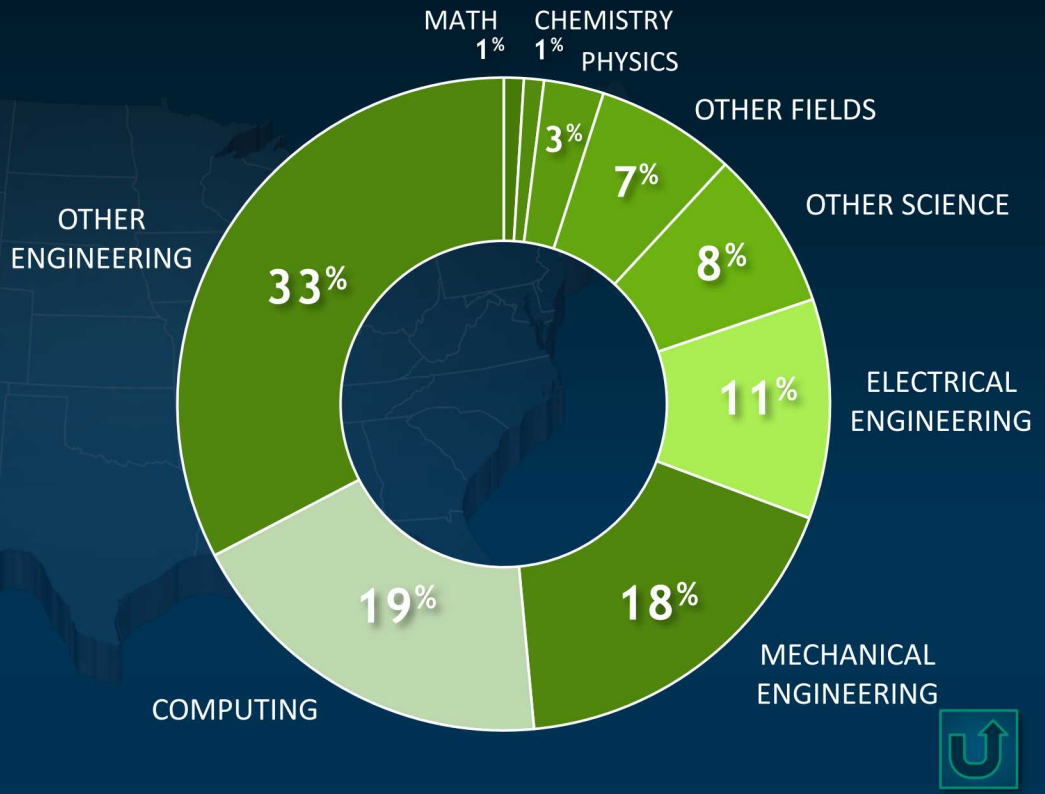
R&D staff: ~3,800

(excluding R&D Tech)

Distinguishing research capabilities:

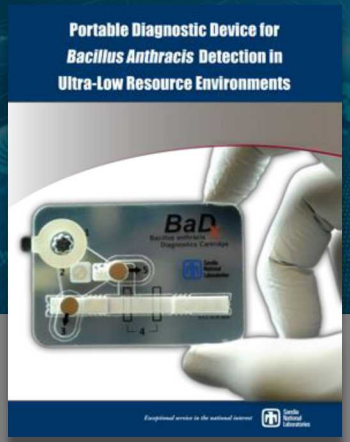
- Renewable Energy
- Micro-electronics/Semiconductors
- Cybersecurity
- Homeland Security *and more*





Data as of June 29 end of Q3 of the FY18

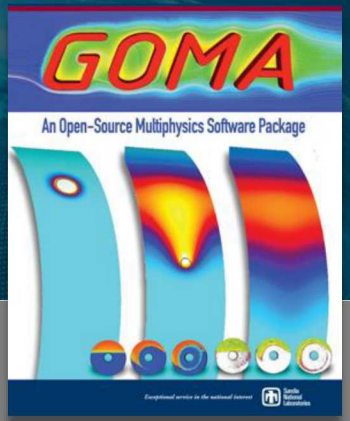
Work with real-world impact



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

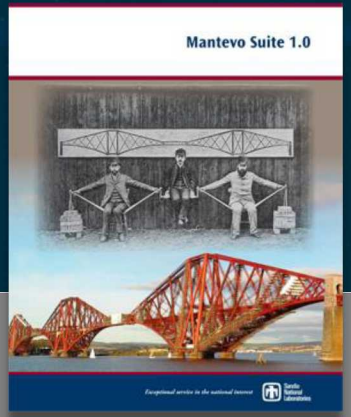
Sandia develops a software package for modeling and simulation, which solves problems in all branches of mechanics, including fluids, solids, and thermal analysis.

>> 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.

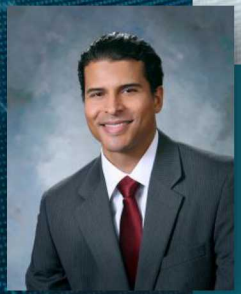
>> WATCH VIDEO

Work with top minds

Our unique work requires the collective minds of the nation's top scientists, engineers, and support staff.

Cliff Ho
Fellow of the American Society of Mechanical Engineers

Ireena Erteza
Asian American Engineer of the Year Award



Conrad James
Black Engineer of the Year Special Recognition Award

Salvatore Campione
Early Career Computer Modeling Award

Sandia's Brand Promise - *Sandia's Employee Value Proposition*

- ***National Security Mission:***
  Your work contributes to the security, peace and freedom of our nation and the world
- ***Uniquely Challenging and Important Work:***
  The work you do will be challenging, and amazing with real-world impact
- ***Work with Great People:***
  You will work with extraordinary people, the top minds in their field
- ***Research Facilities Like None Other:***
  You will have access to some of the best tools, equipment, and research facilities in the world
- ***Healthy Lifestyle, Work-Life Balance:***
  You will experience a balance between your work life and personal life through flexible schedules, competitive benefits, and convenient amenities
- ***Career Mobility:***
  You can have a full-life career at Sandia by working across multiple projects and areas of your interest

Available Videos

Videos require wifi in order to play

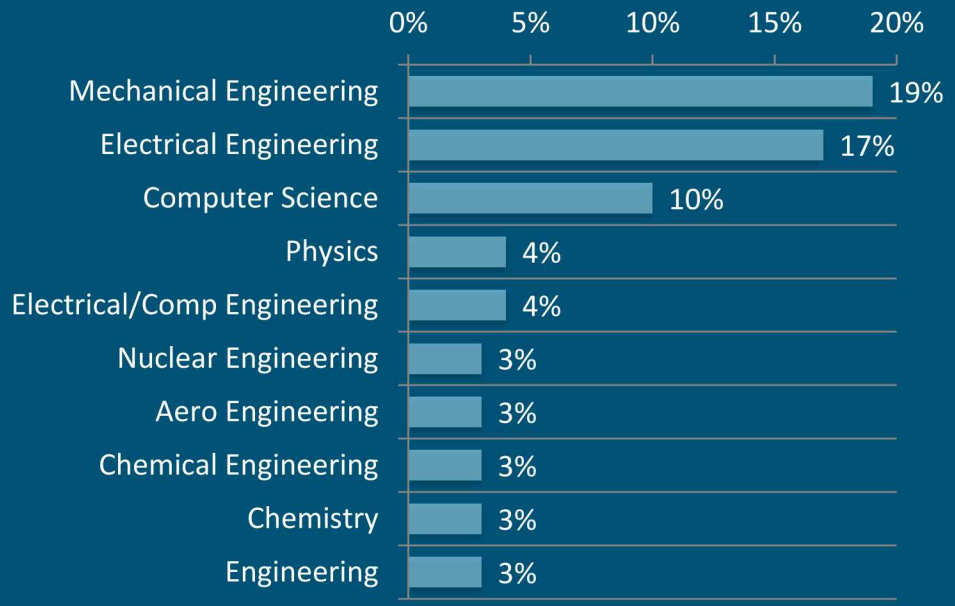
Sandia Mission Video (4:36)
Sandia Our Roots(3:05)

Location Videos
Sandia New Mexico Location (3:23)
Sandia California Location (3:41)

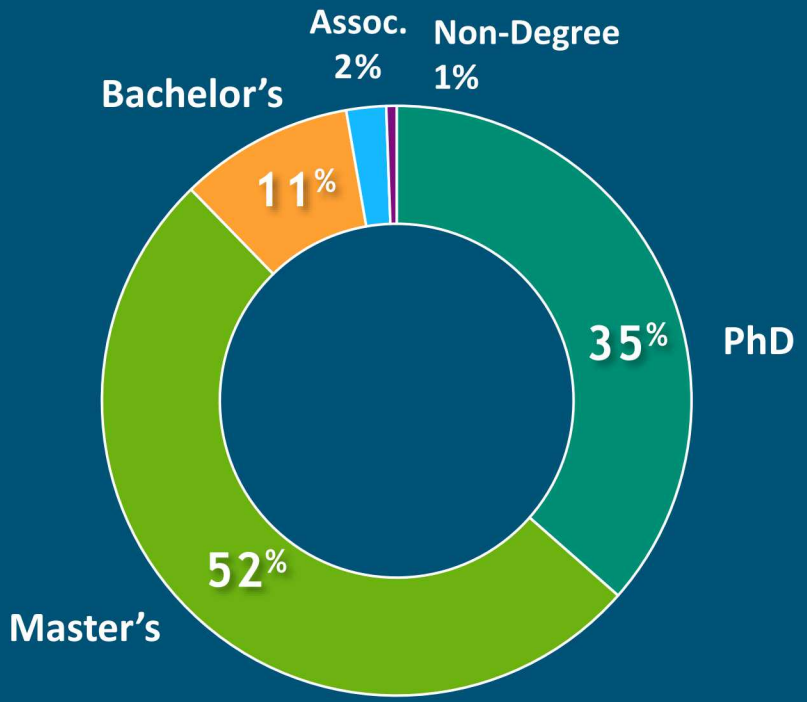
Diversity & Inclusion Videos
Black Leadership Outreach
Asian Leadership Outreach
American Indian Outreach
Hispanic Leadership Outreach

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

R&D by Discipline & Degree



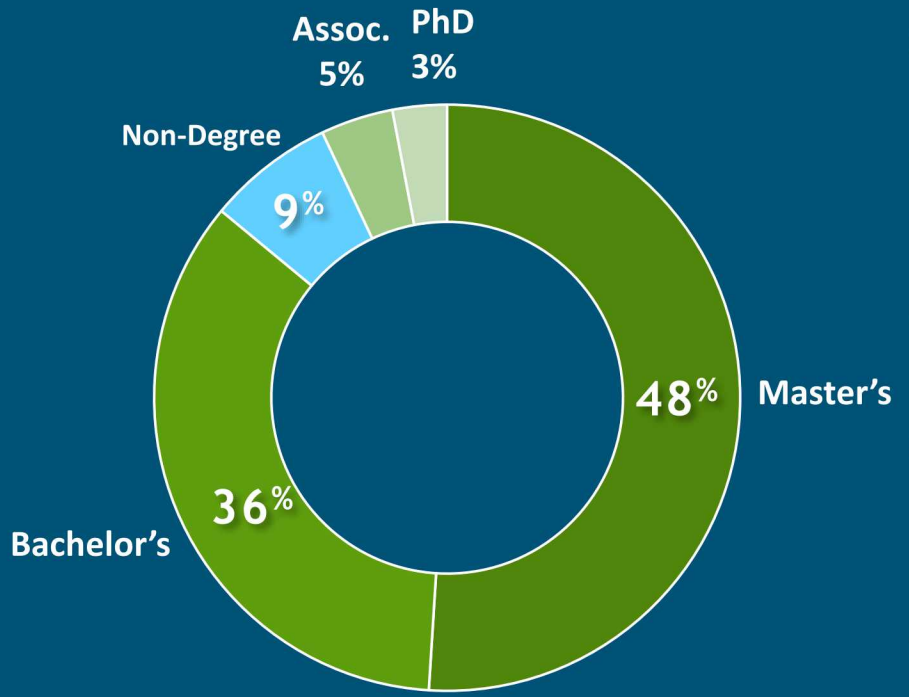
Top 10 job descriptions shown, Regular exempt non-management employees only



Data as of June 29 end of Q3 of the FY18

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

Data as of June 29 end of Q3 of the FY18

Our Culture – Our Values

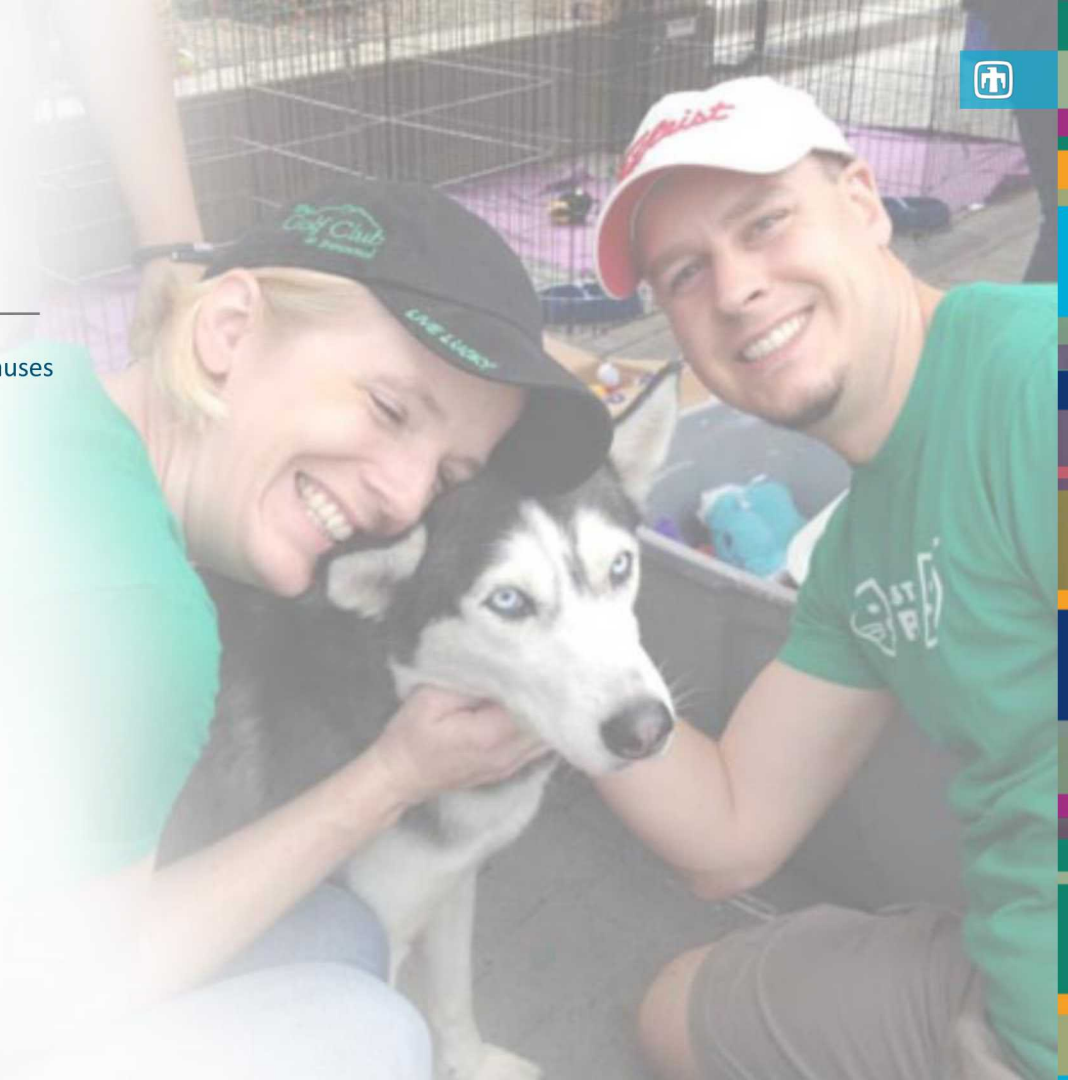
- We serve the nation
- We team to deliver with excellence
- We respect each other
- We act with integrity
- We live safe and healthy lives

Our Culture – Giving Back

~ $5 Million Donated to Nonprofits Annually

Volunteers donate their time to the following causes

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



Education and Mentoring

In-house Education, Training and Mentoring Programs

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

Veterans

Recognizing that veteran capabilities and attributes complement our mission and values, we're intent on attracting the nation's top veteran talent to our company.

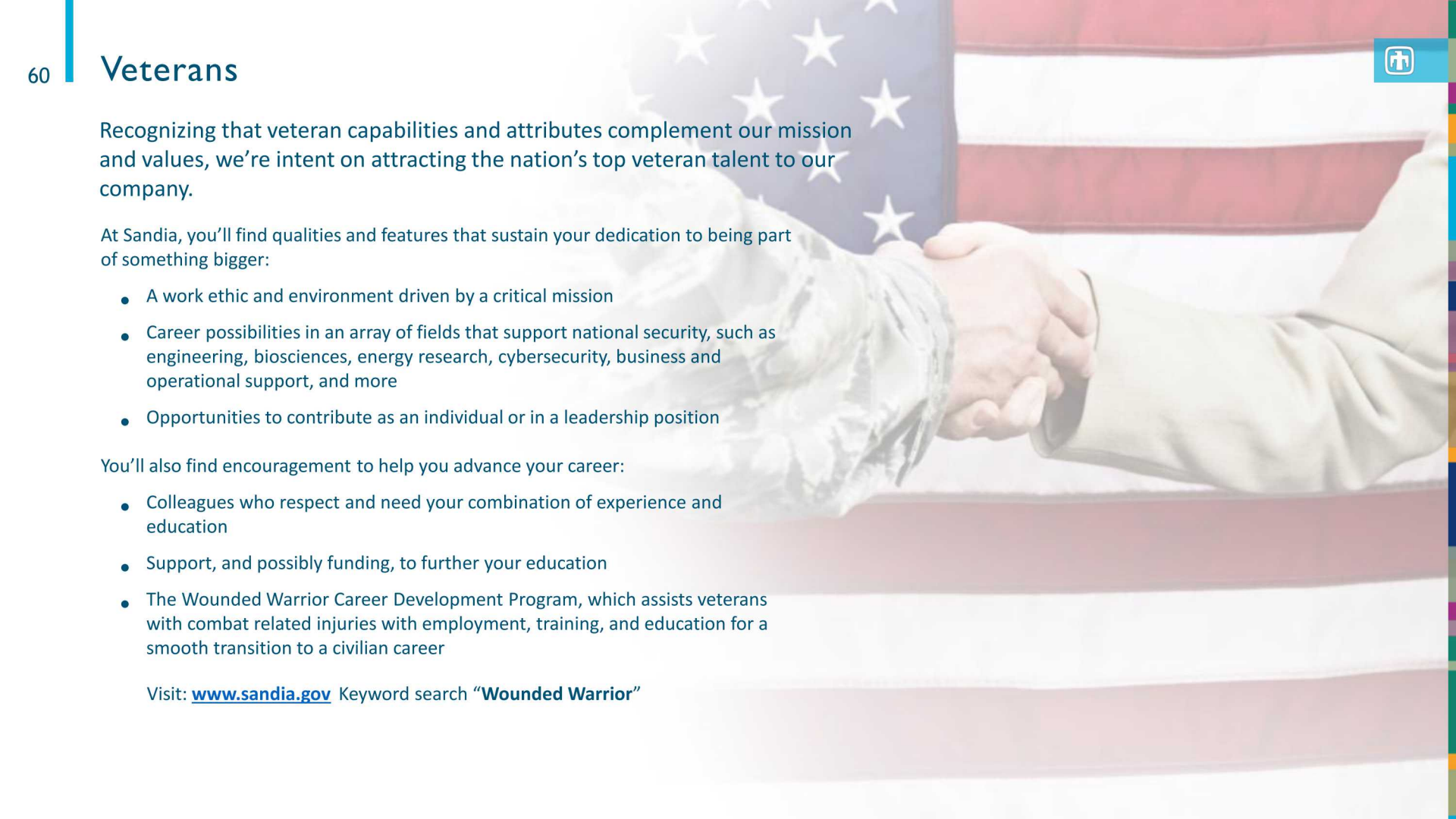
At Sandia, you'll find qualities and features that sustain your dedication to being part of something bigger:

- A work ethic and environment driven by a critical mission
- Career possibilities in an array of fields that support national security, such as engineering, biosciences, energy research, cybersecurity, business and operational support, and more
- Opportunities to contribute as an individual or in a leadership position

You'll also find encouragement to help you advance your career:

- Colleagues who respect and need your combination of experience and education
- Support, and possibly funding, to further your education
- The Wounded Warrior Career Development Program, which assists veterans with combat related injuries with employment, training, and education for a smooth transition to a civilian career

  Visit: **www.sandia.gov** Keyword search "**Wounded Warrior**"



Institute Internships

Institute Programs Website

- AutonomyNM
- Center for Computing Research (CCR)
- Interns for Security, Arms Control, and Force Protection Engineering (iSAFE)
- Mathematics & Analytics Research Technical Internship for Advanced National Security (MARTIANS)
- Mission Services Talent Acquisition Team (MSTAT)
- Nonlinear Mechanics and Dynamics (NOMAD)
- Nuclear Weapons Summer Product Realization Institute (NWSPRINT)
- Research and Applications of Mechanics of Structures (RAMS)
- Science of Extreme Environments Research Institute (SEERI)
- SENTINL: Energy Surety Incubator (ESI)
- TITANS: Center for Analysis Systems and Applications (CASA)
- TITANS: Center for Cyber Defenders (CCD)
- TITANS: Interdisciplinary Design, Engineering, and Assurance Students (IDEAS)
- TITANS: Monitoring Systems and Technology Intern Center (MSTIC)
- TITANS: RISE

Outreach & Networking Groups

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

And many other employee engagement groups