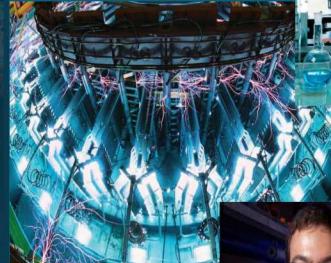


# R&D for High Risk, High Consequence Applications

GAIN 2020

SAND2020-1331PE



Michelle A. Pang, Sandia National Laboratories

Senior Member of Technical Staff

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## Fulfilling Our National Security Mission



### *Nuclear Deterrence*



### *Defense Nuclear Nonproliferation*



### *National Security Programs*



### *Energy & Homeland Security*

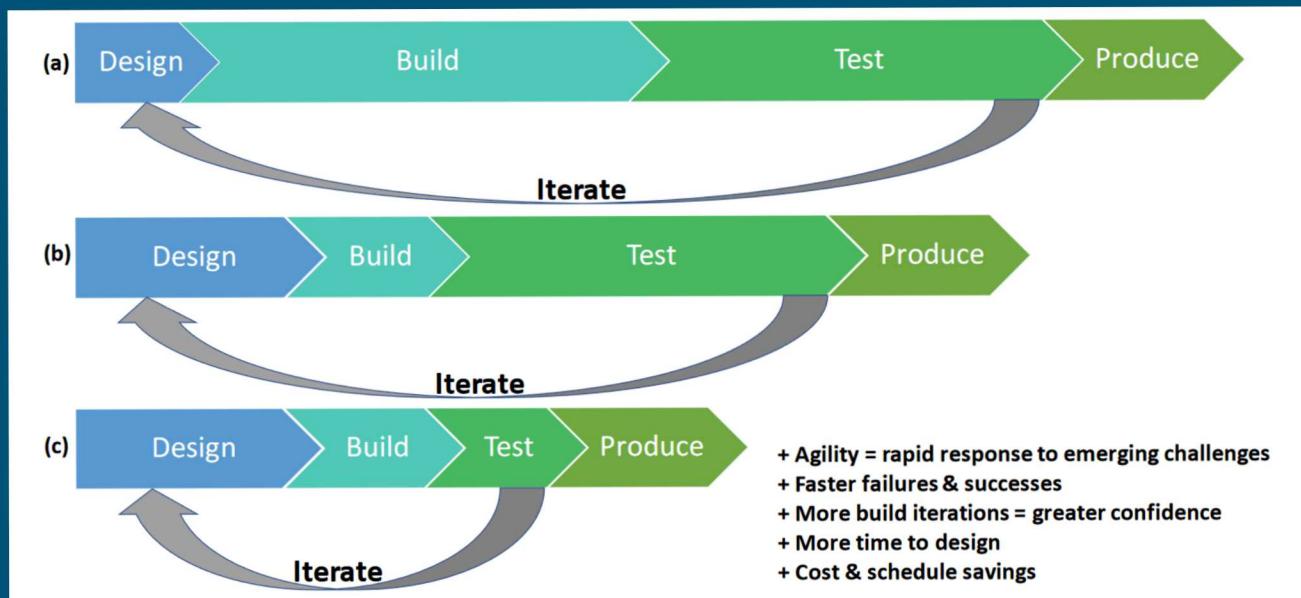


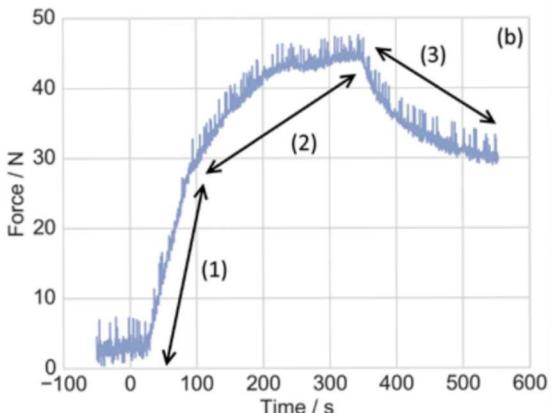
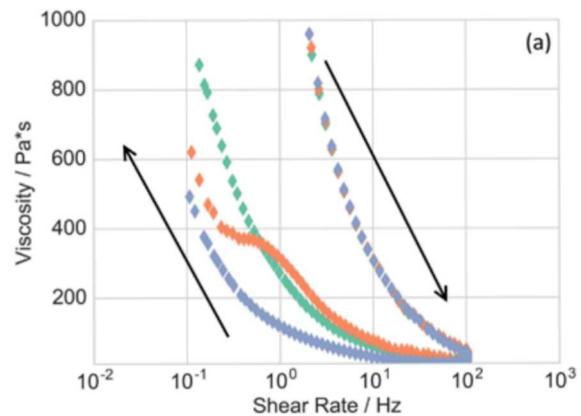
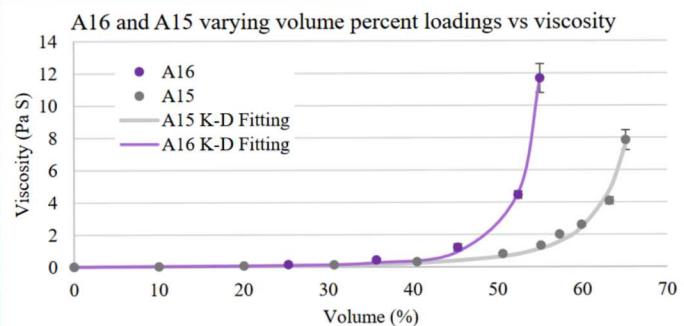
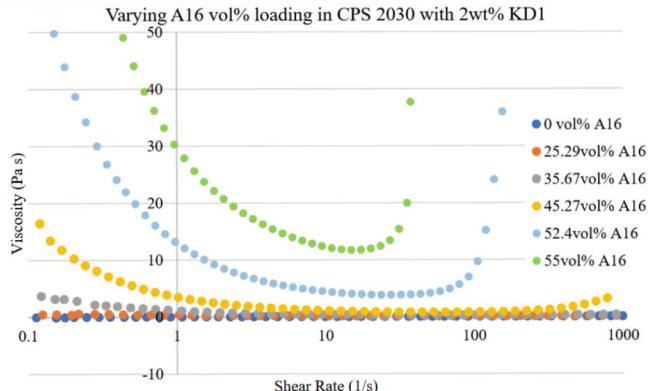
### *Advanced Science & Technology*

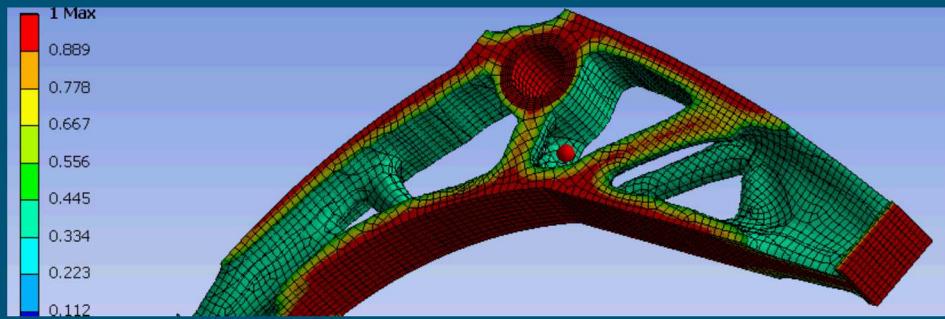
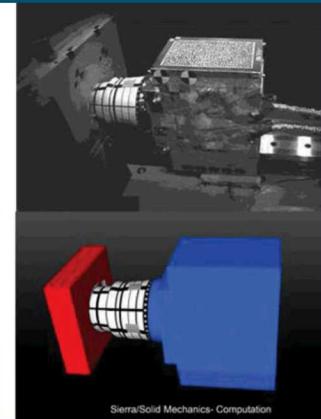
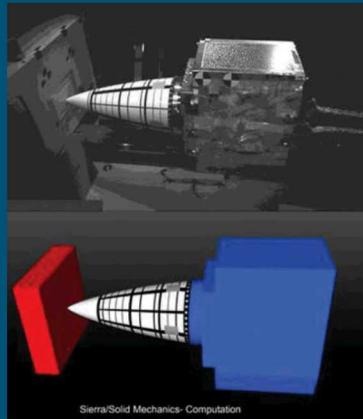
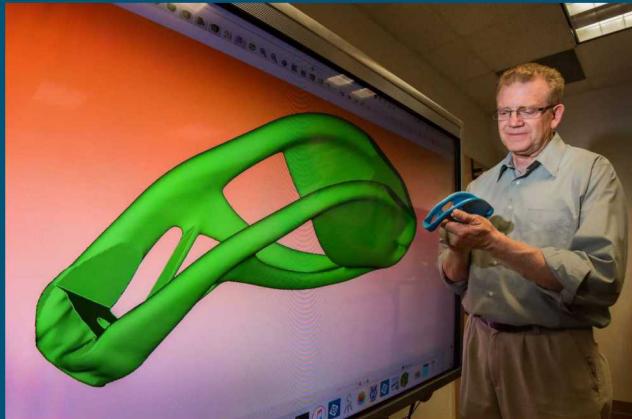
Strengthening America's security mission is a top priority for the National Nuclear Security Administration. Our mission is to defend our country and its allies from nuclear weapons, to develop clean, safe, and reliable energy, to support the medical, pharmaceutical, and space industries, to protect the environment, and to promote the safety and security of our communities and the quality of life.

## R&D Landscape: Additive Manufacturing

- Interested in a new technology
  - Advantages and disadvantages
- Acknowledge the risks or concerns
  - Methods to mitigate risk
  - R&D required to drive down concerns

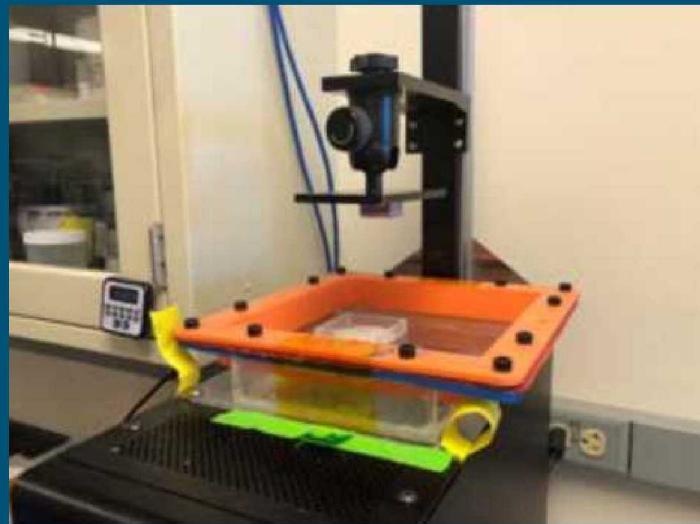
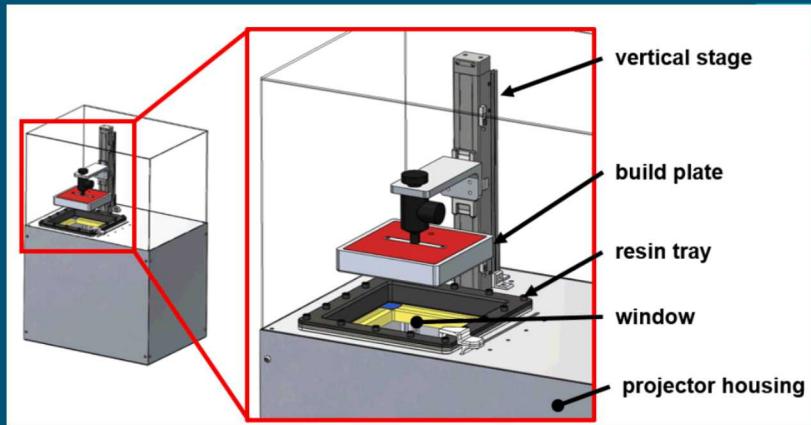
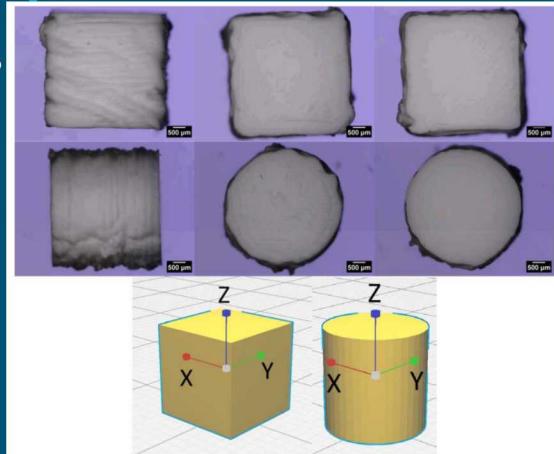




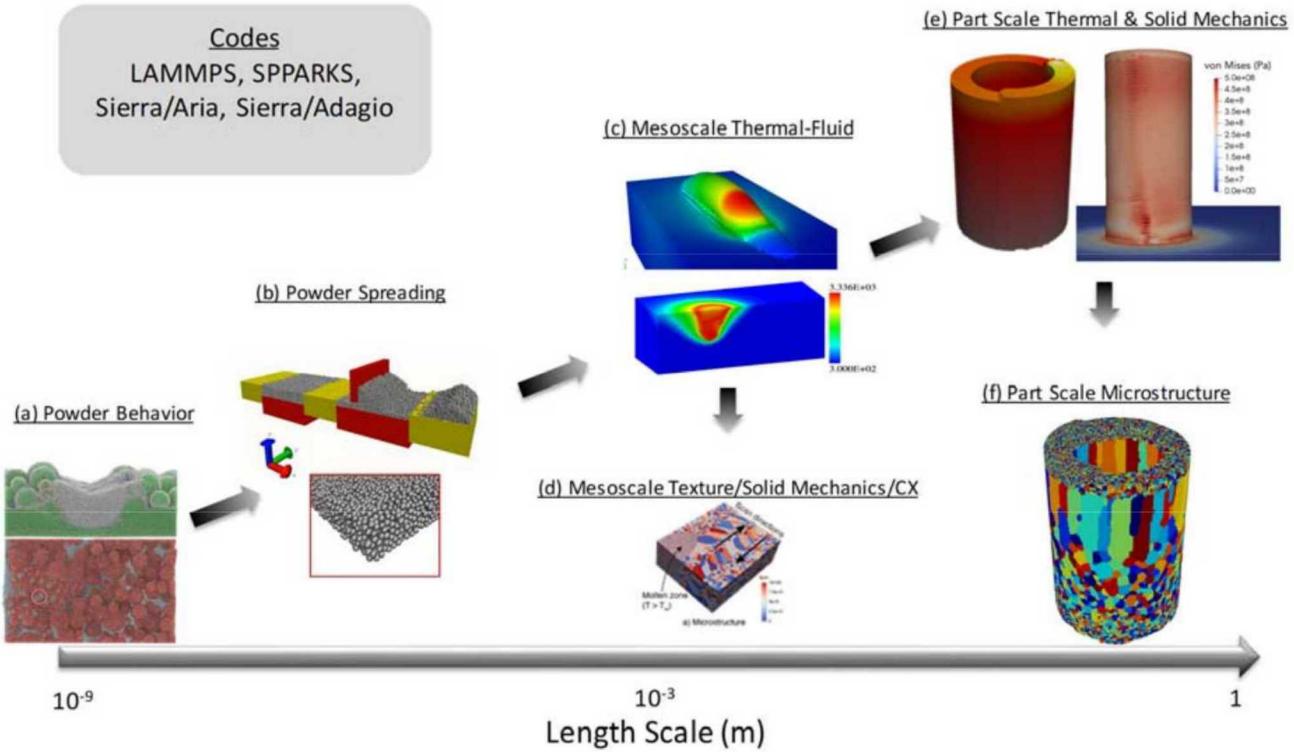


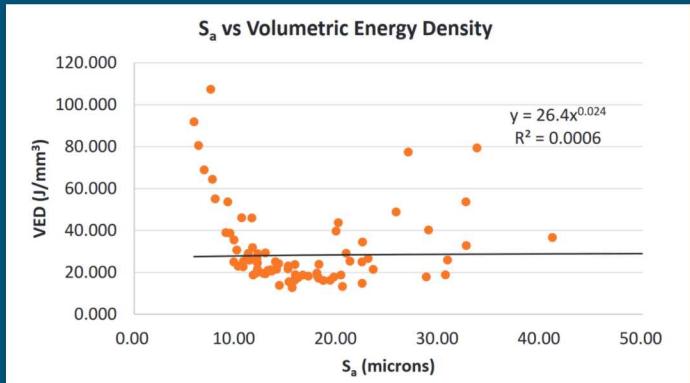
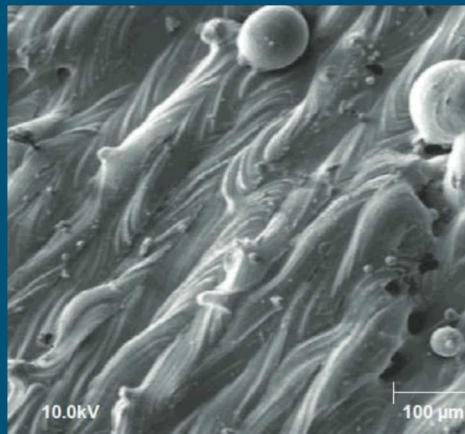
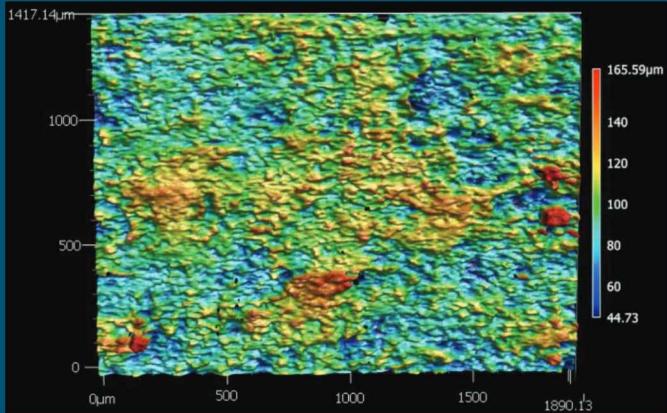
[LAMMPS Video](#)

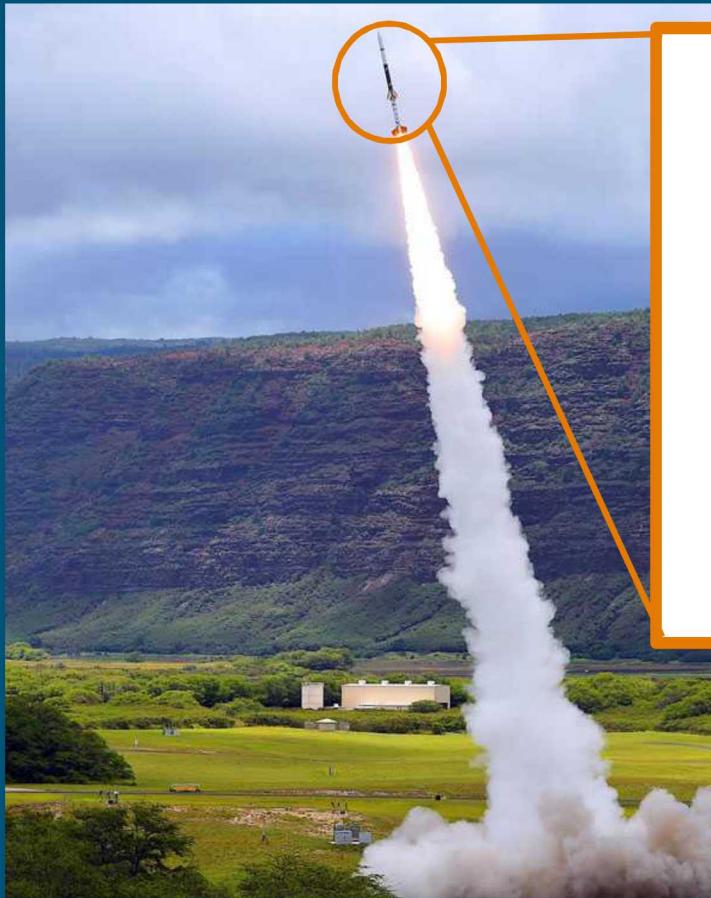
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Codes  
LAMMPS, SPPARKS,  
Sierra/Aria, Sierra/Adagio

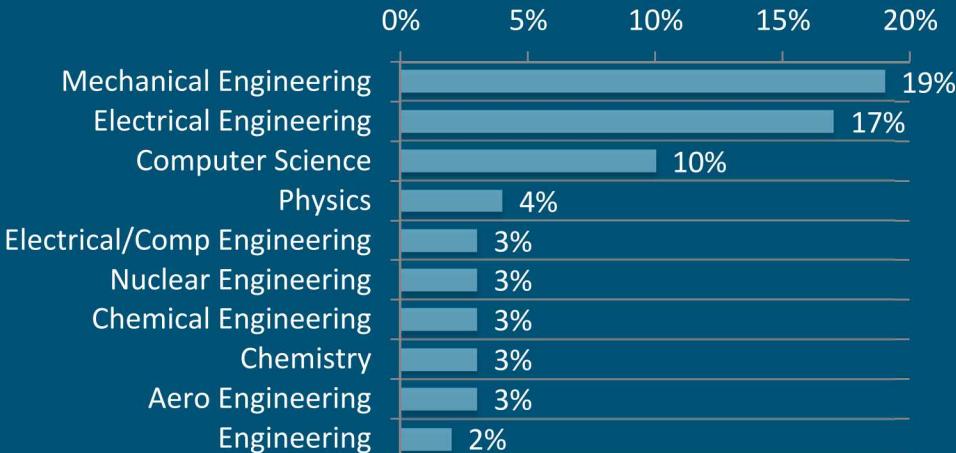




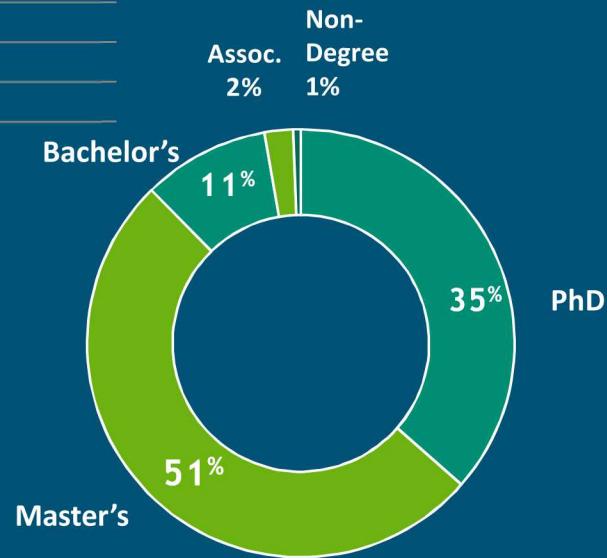


[HOT Shot Video](#)

## R&D by Discipline & Degree



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





## 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

- Full-time enrollment status at an accredited school during the academic school year
- Undergraduate equivalent of 12 hours per semester
- Graduate equivalent of 9 hours per semester
- Must have a minimum cumulative GPA of 3.0 on a 4.0 scale for Technical, R&D, and Business interns; 2.5 on a 4.0 scale for Clerical and Labor interns
- Have U.S. citizenship for positions that require a security clearance or as stated in the job posting
- 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.

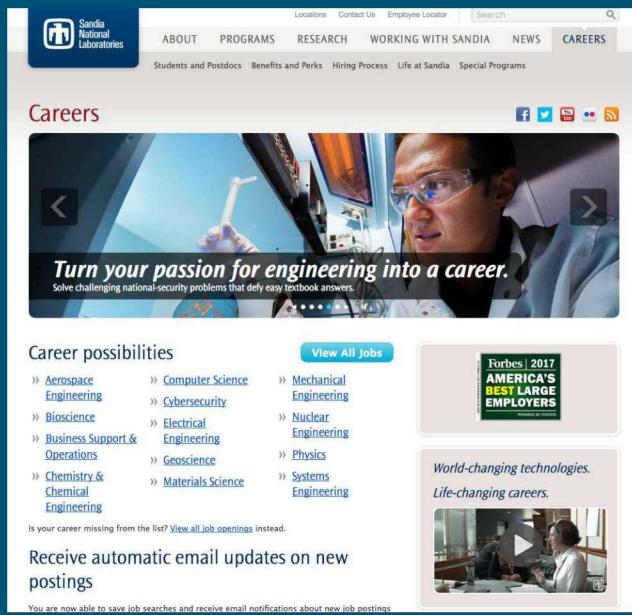
### Postdoctoral Fellowships

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

*\*Sign up for Automated Job Notifications!*



# Apply Online! [sandia.gov/careers](http://sandia.gov/careers)

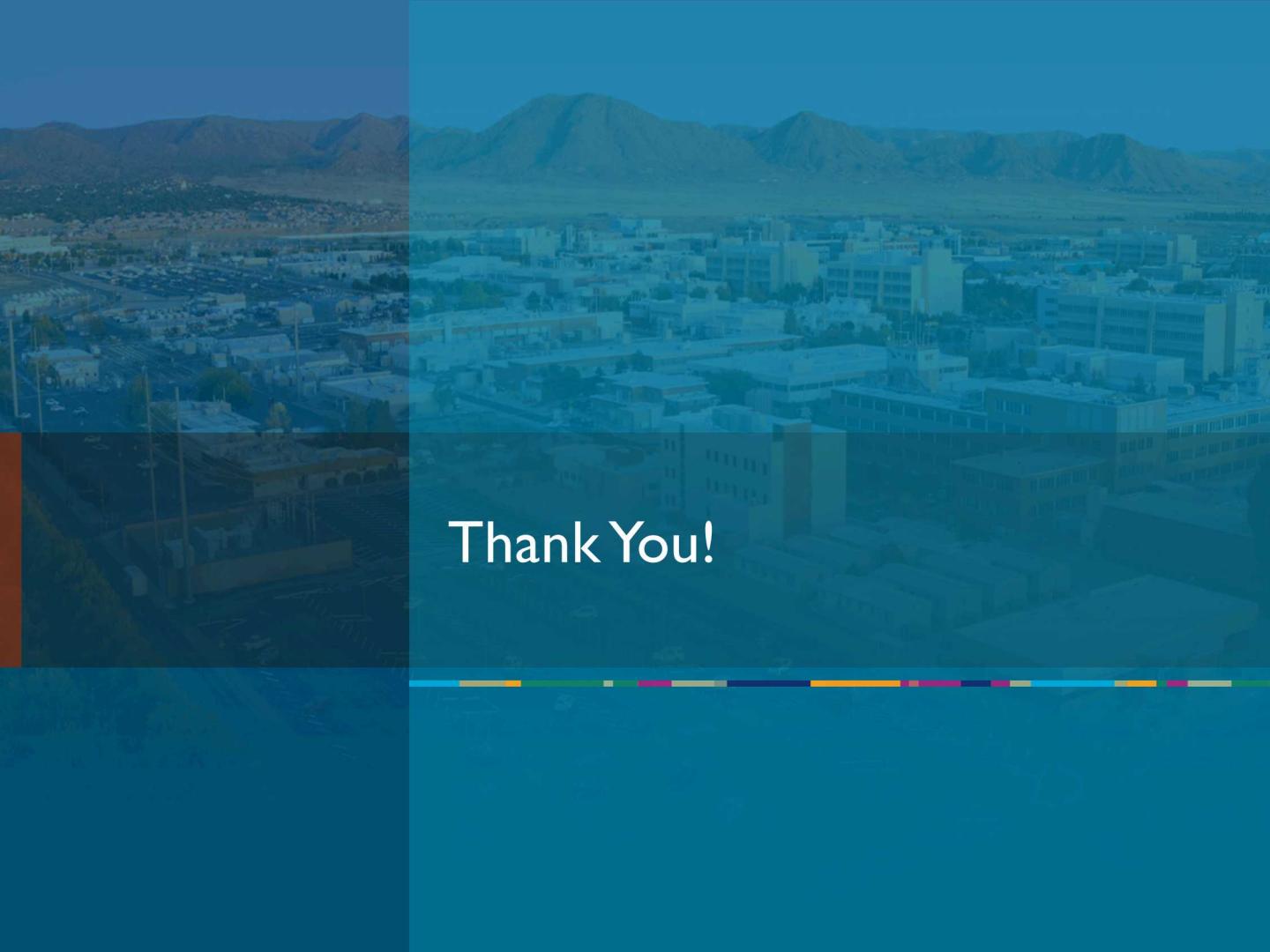


The screenshot shows the Sandia National Laboratories careers website. At the top, there is a navigation bar with links for Locations, Contact Us, Employee Locator, a search bar, and a magnifying glass icon. Below the navigation bar, there are links for ABOUT, PROGRAMS, RESEARCH, WORKING WITH SANDIA, NEWS, and CAREERS. Under CAREERS, there are sub-links for Students and Postdocs, Benefits and Perks, Hiring Process, Life at Sandia, and Special Programs. The main content area features a large image of a man in a lab coat and safety glasses looking at a computer screen. A banner over the image reads: "Turn your passion for engineering into a career. Solve challenging national-security problems that defy easy textbook answers." Below the banner, there is a section titled "Career possibilities" with a "View All Jobs" button. This section lists various engineering fields: Aerospace Engineering, Computer Science, Mechanical Engineering, Bioscience, Cybersecurity, Electrical Engineering, Nuclear Engineering, Business Support & Operations, Geoscience, Physics, Chemistry & Chemical Engineering, Materials Science, and Systems Engineering. At the bottom of the page, there is a note: "Is your career missing from the list? [View all job openings](#) instead." and a message: "Receive automatic email updates on new postings". A note at the bottom states: "You are now able to save job searches and receive email notifications about new job postings".

Sign up for  
Automated  
Job  
Notifications!

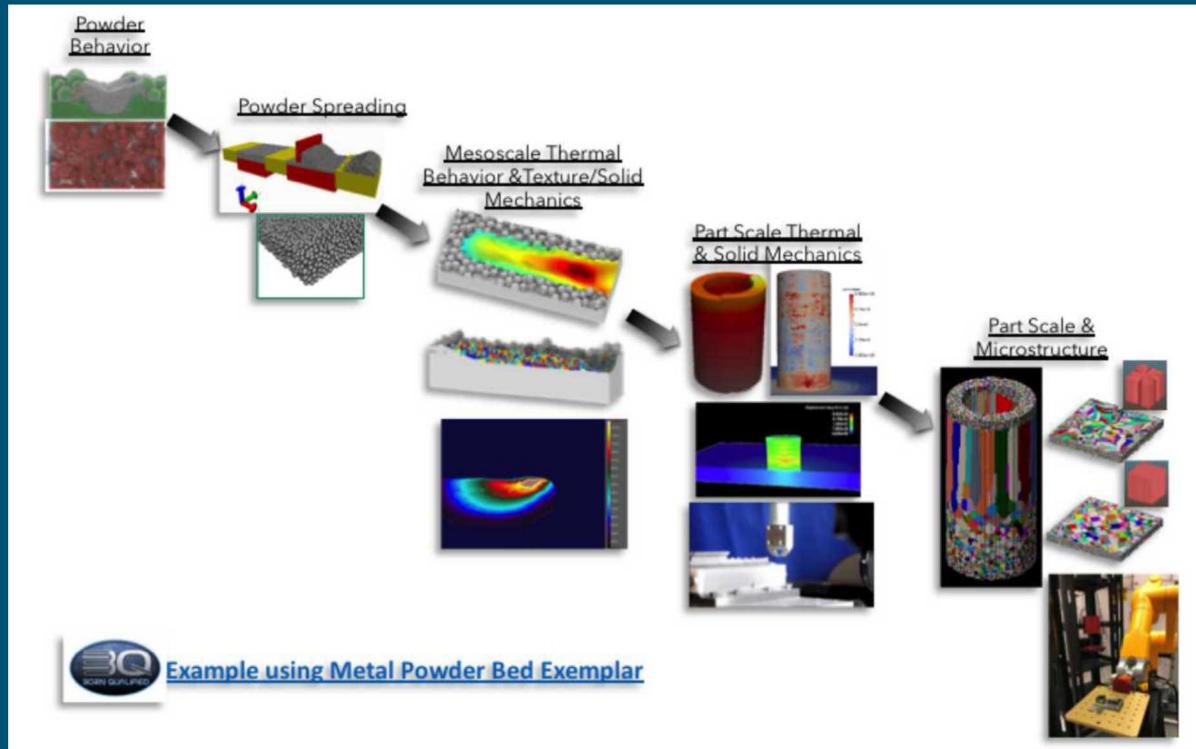
Mobile Job  
Applications

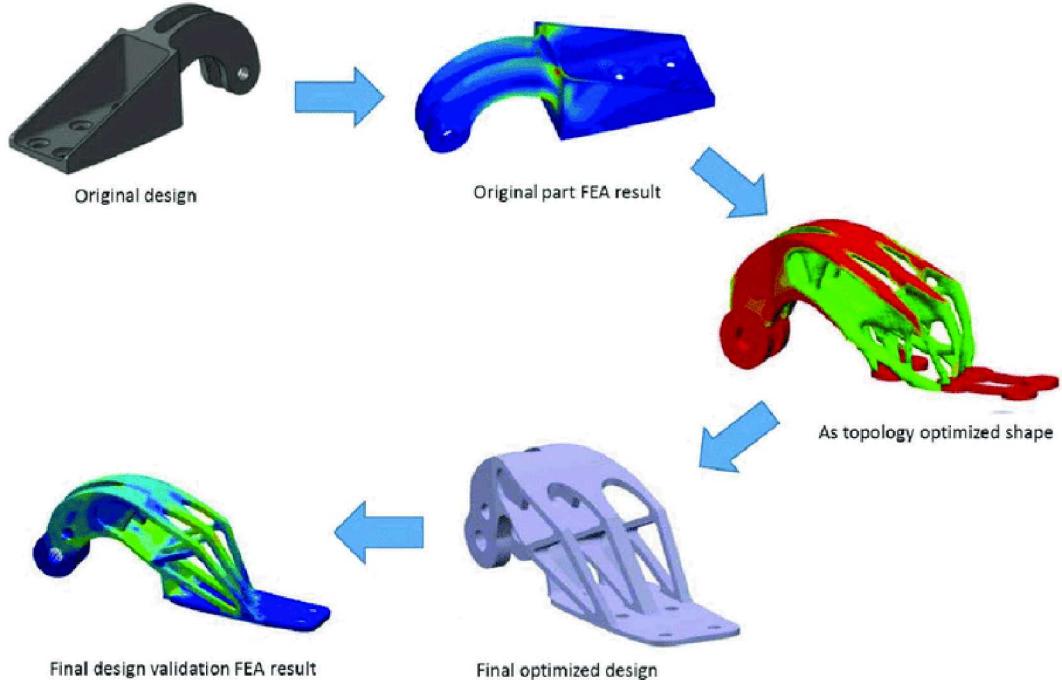




Thank You!

# Backup Slides





*Additive Manufacturing Edition*

## Sandia's Additive Manufacturing IP Portfolio

Title
Freeforming of Materials from Powder Slurries
Apparatuses and Methods for Shuttering an Aerosol Particle Stream
Energy Beam Driven Rapid Fabrication System
Multiple Beam System for Material Deposition
Four Axis Powder Delivery Nozzle System
Aerodynamic Beam Generator for large particles
Two Fluid Hydrodynamic Printing
Powder delivery improvements for fed powder additive manufacturing
Metallic Nanoink Development for Direct Write Applications
Method for Producing a Net-Shaped Aerogel
Solid Freeform Fabrication Using Chemically Reactive Suspensions
Method for Producing a Net-Shaped Aerogel
Method for Making a Bio-Compatible Scaffold
AM Tool Path Generator with Embedded Process Control Commands
Completely Additively Manufactured Actuator

Tools

Materials

Process

## 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](#)