



Sandia
National
Laboratories

Exceptional service in the national interest

Sandia Data Challenge

General Info Session/Q&A

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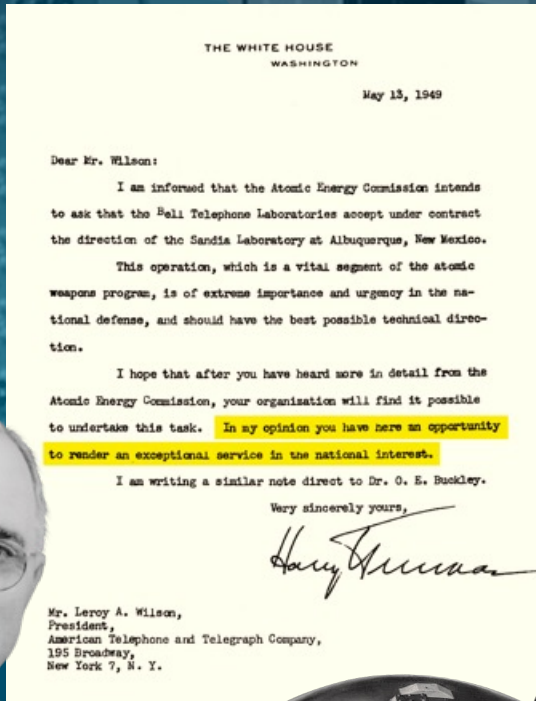
Outline

- SNL history
- Who we are
- What do we do
- Opportunities
- The Data Challenge!

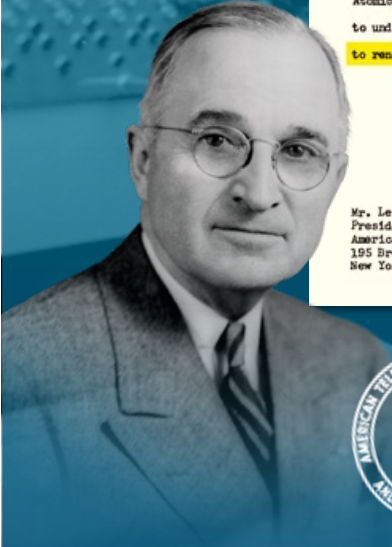
Who are we?



OUR HISTORY IS TRACED TO THE MANHATTAN PROJECT



- July 1945: Los Alamos creates Z Division
- Nonnuclear component engineering & systems integration
- Federally Funded Research and Development Center
- November 1, 1949: Sandia Laboratory established
- March 8, 1956: Sandia California officially opened
- AT&T: 1949-1993
- Martin Marietta: 1993-1995
- Lockheed Martin: 1995-2017
- Honeywell: 2017-present



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



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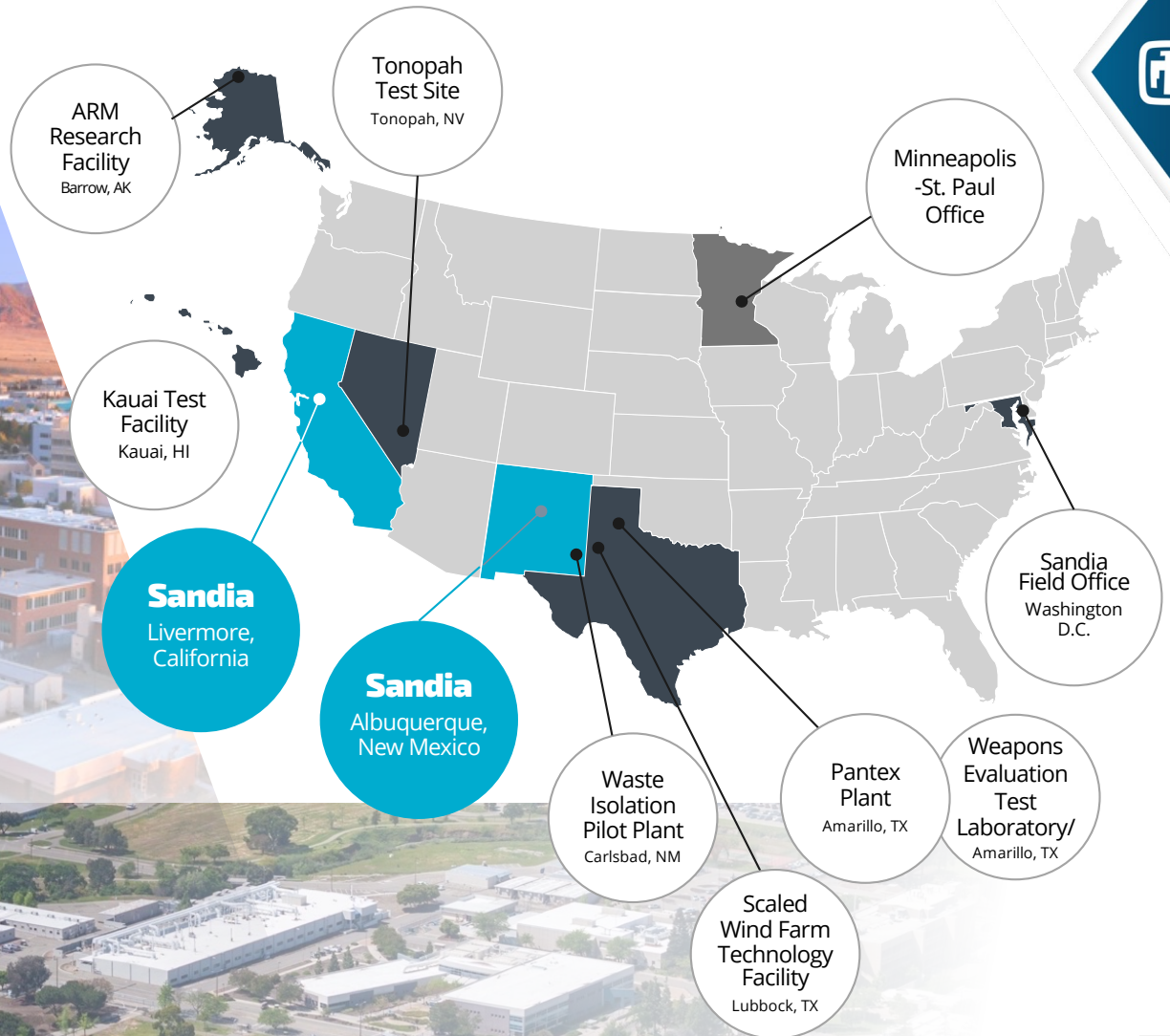
Government-owned, contractor-operated

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

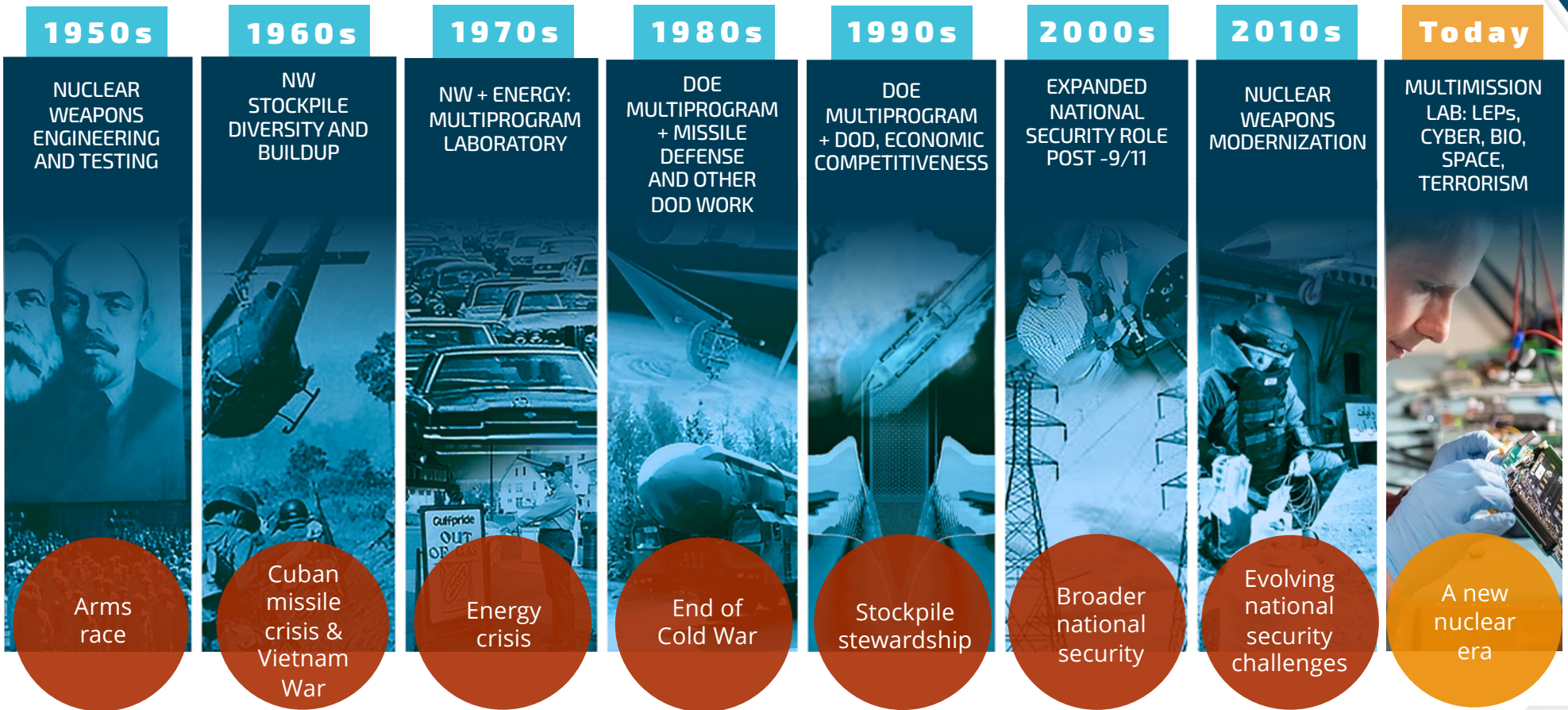
WE HAVE FACILITIES ACROSS THE NATION

Main Sites

Albuquerque, New Mexico
Livermore, California



OUR ROLE HAS EXPANDED OVER THE DECADES



SANDIA HAS FIVE MAJOR PROGRAM PORTFOLIOS





AIS transforms decision making.

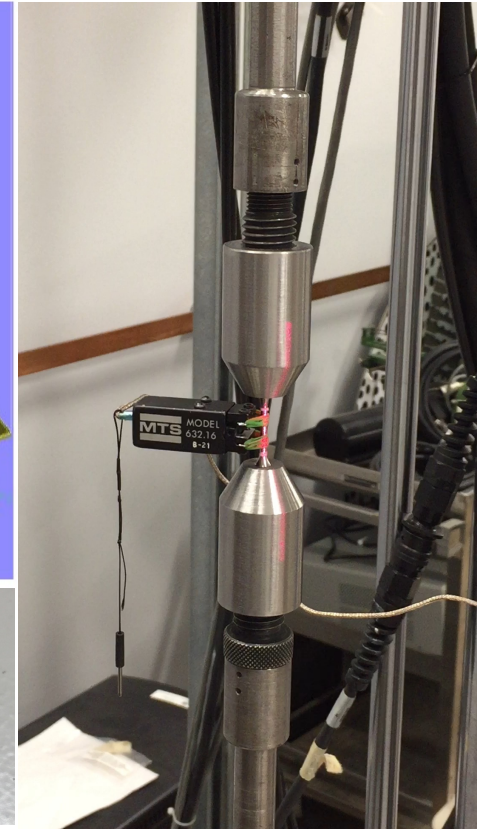
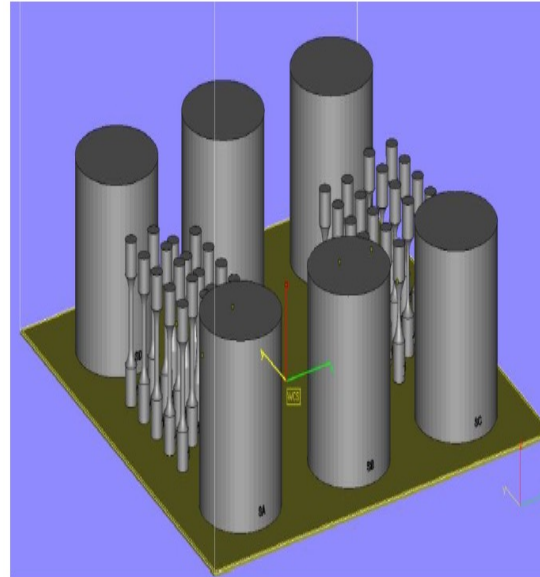
APPLIED INFORMATION SCIENCES CENTER

We research and apply innovative techniques for high-impact National Security decision making.





- **Design of experiments for expensive tests**
- **Statistical Inference to characterize material strength of AM parts**
- Increased knowledge of Additive Manufacturing leads to:
 - Rapid prototyping
 - Ease in creating complex geometries
 - Weight savings without sacrifice in strength





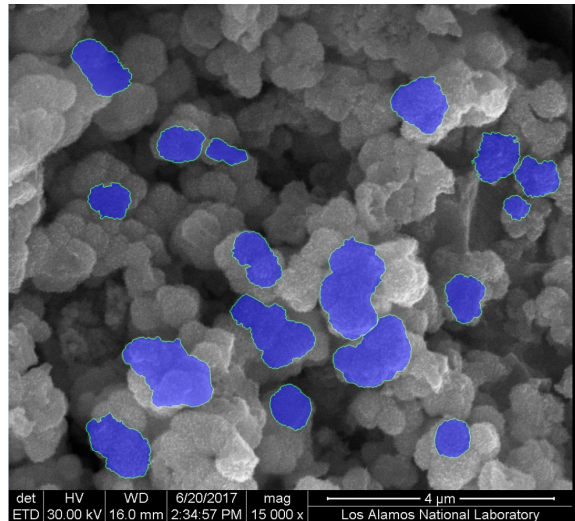
Using distributional measurements for inverse prediction

84.904

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- Many measurements of different particles from material produced under same conditions
- Treat distributional response as a function via ECDF and use FDA for inverse prediction



Under what conditions was this material produced?

Where and who produced this material?



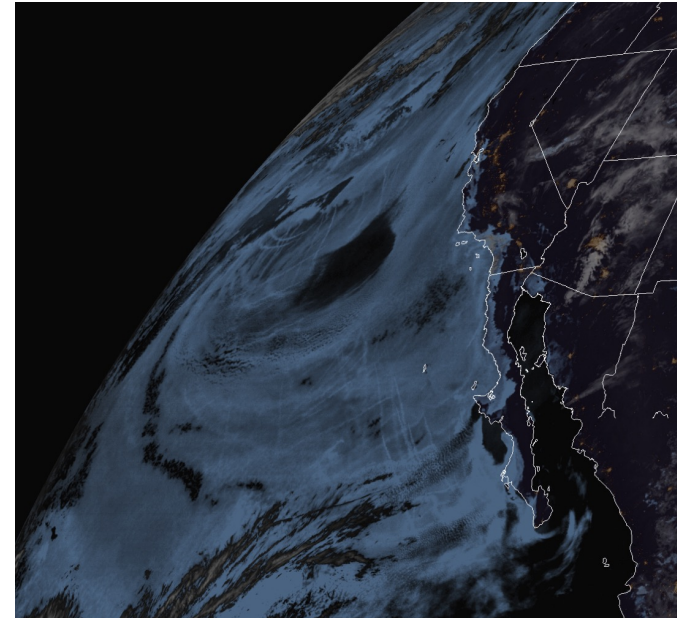


Effects of emissions in marine environments

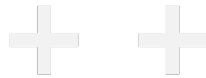
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- **Aerosols, whether natural or man-made, are the large contributor to climate change uncertainty**
- Seek to characterize local spatio-temporal aerosol emission effects on clouds in marine environments
- This research can lead to **advances in geoengineering**



Energy &
Homeland
Security





Impact of uncertainty visualizations on human decision making

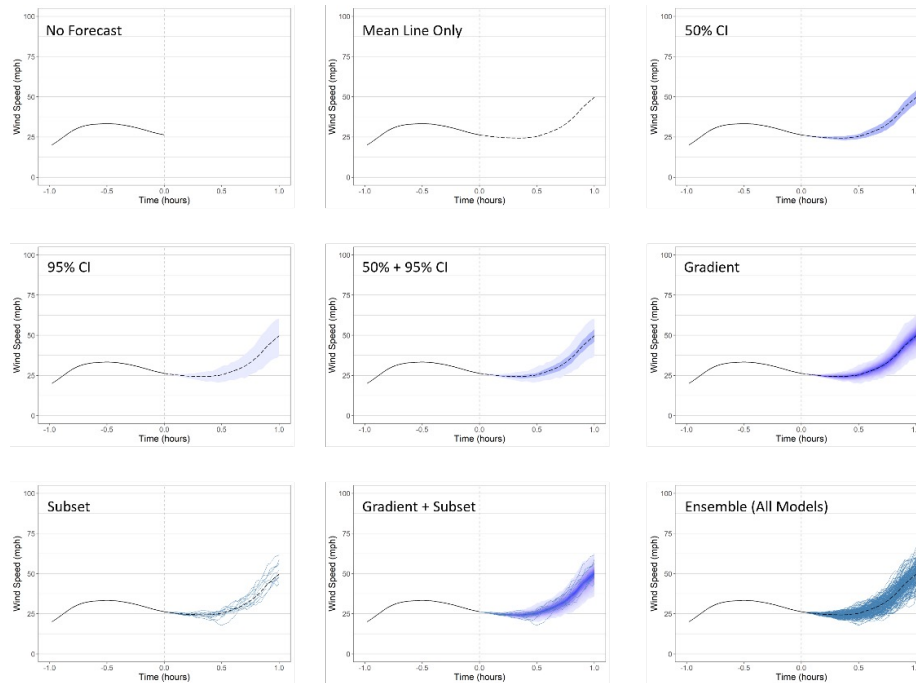
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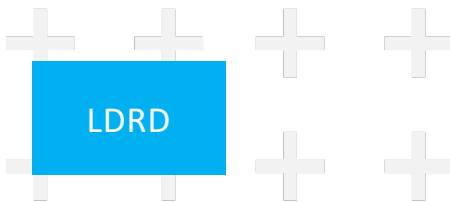
- People must make high consequence decisions using uncertain information
- **Does the visualization of forecast uncertainty change the decisions people make on the same data?**
- We can collect data from human subjects experiments to help answer these questions

Windspeed forecasts:



Task:

- You are a grid operator. There is a high risk of wildfire.
- You must shut off the grid if the windspeed will exceed 50mph in the next hour.
- Otherwise, downed power lines may spark a wildfire



Outcome:

- People make more **risk-averse decisions** when shown **wider uncertainty bands**
- When the data is less ambiguous, the uncertainty visualization has a smaller impact
- **Seemingly simple design choices can bias people into making non-optimal decisions**

Opportunities at Sandia





Opportunities at Sandia

- **Student Internships**
 - Opportunities for undergraduate and graduate students
 - Learn about the laboratory and gain new skills
 - Options for **summer or year-round** positions
 - Summer postings start in the Fall (~August) and final selections are made in early Spring (~April) so starting to apply early is key
- **Postdoctoral Appointee Positions**
 - Limited term (~**2 years**)
 - Focus on **fundamental research** and publishing with a possible transition to a staff role
 - Postings go up year-round, but there is more activity during Fall recruiting
- **Staff Roles**
 - Roles range from consulting to applied development to research to project management
 - Postings go up year-round

*Sandia is required by DOE to conduct a pre-employment drug test and background review that includes checks of personal references, credit, law enforcement records, and employment/education verifications. Applicants for employment need to be able to obtain and maintain a DOE L-level security clearance, which requires U.S. citizenship.



MARTIANS: TITANS Math & Analytics Internship Institute

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- The **MARTIANS (TITANS: Math & Analytics)** internship program aims to attract and hire top interns with exceptional math and analytics talent, combined with enthusiasm for Sandia's national security focus. **MARTIANS aims to become an integral part of the corporate pipeline**, providing a lab-wide resource for potential permanent staff members with math and analytics talent, hiring approximately 20 interns each summer.
- The MARTIANS Summer 2023 interns include 13 graduate and 10 undergraduate math, statistics, computer science, and engineering students from **Harvard, Arizona State, UT Austin, UCLA, UIUC, Purdue, University of Utah, Rice, University of California Riverside, BYU, Georgia Tech, Stanford, Johns Hopkins, and the University of North Carolina**. The majority of these outstanding students will be joining us onsite at Sandia for the first time since the pandemic. From one student, **"I don't know if I've ever been more excited for a summer in my life"**!



Opportunities in Our Group

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Sandia National Laboratories

About Sandia News Research Partnerships Careers

Students and Postdocs Veterans Career Disciplines Benefits Belonging at Sandia Hiring Process

Students and Postdocs

Internships & Co-ops

- Institute Programs
- How to Apply
- Benefits
- FAQs
- Distinguished Level Fellowships
- Foundation Level Fellowships
- Postdoctoral Positions
- Critical Skills Recruiting Program
- Recruiting

An internship with real-world application

Current Openings

Albuquerque, NM **46** Livermore, CA **17** Other Sites **0**

- [Intern, R&D Undergraduate Summer - Monitoring Systems Technology Intern...](#)
- [Intern, R&D Undergraduate Year Round - Monitoring Systems Technology I...](#)
- [Intern, R&D Graduate Summer - Monitoring Systems Technology Intern Cen...](#)
- [Intern, R&D Undergraduate Co-op - Monitoring Systems Technology Intern...](#)
- [Intern, R&D Graduate Year Round - Monitoring Systems Technology Intern...](#)
- [Intern, R&D Graduate Co-op - Monitoring Systems Technology Intern Cent...](#)
- [Intern, R&D Undergraduate Summer - TITANS-Math and Analytics \(MARTIANS...](#)
- [Intern, Technical Undergraduate Year Round - Computer-Aided Drafting &...](#)
- [Intern, R&D Graduate Summer - TITANS-Math and Analytics \(MARTIANS\), O...](#)
- [Intern Summer - R&D Graduate START HBCU, Cyber Security](#)
- [Intern, Technical High School Year Round - Monitoring Systems Technolo...](#)

Show More | [View All Sandia Openings](#)

<https://www.sandia.gov/careers/>

Intern, R&D Graduate Summer, Statistics, Onsite

Albuquerque, NM
Job ID: 693779

[Apply Now](#)

Intern, R&D Undergraduate Summer - TITANS-Math and Analytics (MARTIANS), Onsite

Albuquerque, NM
Job ID: 694131

[Apply Now](#)

Intern, R&D Graduate Summer - TITANS-Math and Analytics (MARTIANS), Onsite

Albuquerque, NM
Job ID: 694132

[Apply Now](#)



Critical Skills Masters Program

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Critical Skills Recruiting Program



Sandia
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Critical Skills Recruiting (CSR) Program

Sandia's Critical Skills Recruiting Program (CSR) is a special, entry-level hiring program, which provides new or recent technical bachelor's degree candidates the opportunity to pursue a fully funded Master of Science degree. The CSR program is designed to attract talent pursuing key disciplines aligned with Sandia's national security mission, including Computer Science, Computer Engineering, Cybersecurity, Electrical Engineering, and Mechanical Engineering. In addition, the program supports achievement of a more diverse technical workforce at Sandia.

Successful candidates will become regular full-time Sandia employees and join multidisciplinary teams that are advancing the frontiers of science and technology to solve the world's greatest challenges.

Candidate Eligibility Criteria:

- » Ability to obtain a DOE security clearance which requires U.S. citizenship
- » New or recent Bachelor of Science degree with a minimum cumulative GPA of 3.0/4.0

Candidates must apply online by Thursday, October 17th at sandia.gov/careers.

Search by job ID, or keyword search "Critical Skills Recruiting" or "CSR"

The Data Challenge!





What is it? Why should I participate?

The 2024 Sandia Data Challenge is a competition to solve a real problem faced by Sandia

- An opportunity to work with real world data.
- An opportunity to interface with staff scientists at Sandia.

We often hear from students and new-hires:

- “We never got to work on real problems in school”
- “The textbook problems don’t prepare us for careers after graduation”
- **This is your opportunity to engage on a (difficult) problem engineers and scientists at Sandia worked on!**



Participation Guidelines

- The Data Challenge is open to undergraduate and graduate students, and anyone interested in interacting with real world data.
- Participants are allowed to compete in teams up to 4 students
- There is more than one way to tackle a problem so we invite students across a broad range of data science related disciplines.
- There will be multiple components to the problem including both prediction and inference. Teams with diverse skillsets are encouraged.
- Relevant skills:
 - R, python, Matlab or other software to analyze data
 - Experience analyzing data: statistics, machine learning, mathematical modeling, pattern recognition



Logistics and Timeline

October 31: Data Challenge kick off

- This virtual presentation will explain the problem and data

November 1-2: Open office hours

- Sandia staff will be available at selected times to answer questions about the problem and the data, as well as offer advice and direction

November 4: Judging & Awards

- Submissions are due in the AM and need to include a short video explaining your team's approach and solution to the problem, [additional submission requirements]
- Awards Ceremony

Resources:

- A Discord channel will be set up for open questions and discussion. Your peers and Sandia staff will all participate.



Next Steps

Register ahead of time if you plan on participating. [\[link\]](#)

Each individual must register and accept NDA of the data that will be used in the challenge.



Questions?