



# Careers in National Security Sciences

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at Oak Ridge  
National Laboratory

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# Oak Ridge National Laboratory





AT A GLANCE

Established in  
as part of the Manhattan Project

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**1943**

**\$2.4B** annual budget

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**9** national  
user facilities

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**5,800+** employees

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**3,200** visiting  
scientists

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**232** R&D 100 Awards

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**2** Nobel Prize winners

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**49** National Academy  
members

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**13** UT-ORNL Governor's Chairs

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**9** university core  
research partners

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**10** Contributed to the  
discovery of 10 elements  
(Elements 61, 104-106, and 113-118)

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## Big Science. Big Opportunities.

Oak Ridge National Laboratory (ORNL) was created to help win a war and change the world. We have always adapted to meet national needs, developing expertise, tools, and even entirely new fields to solve the most difficult scientific and technical challenges.

- **We pioneered nuclear energy, science, and engineering**, developing techniques, technologies, and training programs that led to commercialization of nuclear power and creation of the nuclear navy.
- **We produce life-saving medical isotopes** and operate the National Isotope Development Center for the US Department of Energy (DOE).
- **We developed neutron diffraction**, a scientific technique available to researchers who use two of the world's most powerful neutron sources at ORNL for studies of materials, medicines, disease progression, and more.
- **We create new materials**, including alloys with billion-dollar impacts on industry and unique properties that enable NASA to explore outer space.
- **We build some of the world's most powerful supercomputers**, with three No. 1 systems since 2009 and one of the world's first exascale systems, Frontier, due in 2022.
- **We printed a car** (and a house, jeep, boat ...) to study methods for improving the efficiency and productivity of manufacturing processes that give American industry a competitive edge.
- **We secure the nation** with expertise from across our research portfolio, sending teams worldwide to keep nuclear materials safe, pursuing cybersecurity for the power grid, and more.
- **We discovered the sex-determining role of the Y chromosome** and make breakthroughs in biology from genes to ecosystems, providing insights benefiting biotechnology, biosecurity, and biofuels.
- **We invented radioecology** and lead large-scale experiments in the Arctic and other remote locations.

*Join us on  
our quest to  
deliver scientific  
impact that  
changes the  
world.*

We always ask, "What's next?" We stand ready for the unexpected. Today, we are applying our expertise in several areas in the global fight against COVID-19, and we are looking to the future.





## Building the World's Premier Research Institution

National labs are distinguished by their ability to assemble large teams of experts from a variety of scientific and technical disciplines to tackle compelling national problems. They also design, build, and operate powerful scientific facilities that are available to the international research community.

From the start, ORNL has applied scientific discoveries and new technologies to address pressing challenges in the areas of clean energy and global security and to create economic opportunity for the nation. Today, Oak Ridge is the most diverse of the Department of Energy's 17 national laboratories, providing leadership in energy research and technology, advanced materials, nuclear science and engineering, neutron science, isotope production, national security, environmental and biological sciences, and high-performance computing.

Resources like these enable the US to compete in what former ORNL Director Alvin Weinberg called the arena of "Big Science" and they empower our researchers to pursue knowledge that's fundamental to solving some of our world's greatest challenges.



### Biology and Environment

We sequenced the poplar genome and are leveraging these data with ORNL-developed algorithms and supercomputing to engineer better bioenergy feedstocks and more climate-resilient crops.



### Fusion and Fission

A multidisciplinary team is printing a microreactor to help industry address high costs and lengthy deployment timelines that threaten the future of nuclear energy—the nation's largest carbon-free energy source.



### National Security

The Mobile Uranium Facility equips ORNL staff members to characterize, process, package, and transport uranium materials anywhere in the world. We are using our scientific capabilities to counter enduring and emerging threats to national security.



### Materials

We developed a new class of affordable, lightweight superalloys that can withstand temperatures almost 100 degrees Celsius hotter than existing commercial alloys in complex engine parts.



### Clean Energy

Our magnetic coils and power electronics enable the extreme fast charging of electric vehicles—wirelessly. ORNL's expertise also supports industry and has set standards for energy efficiency.



### Isotopes

We produce unique medical isotopes for life-saving treatments and diagnoses, including actinium-227, a critical material for making a highly effective prostate cancer drug.



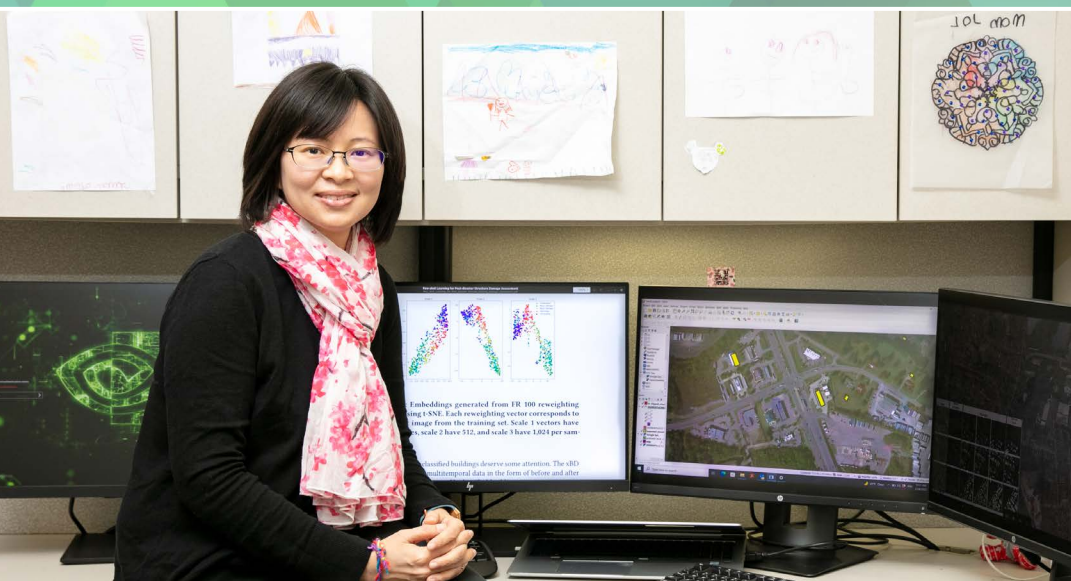
### Neutron Science

We use neutrons to directly observe battery behavior in pursuit of safer, more reliable energy storage and extended battery life, to study the behavior of drugs in combating disease, and much more.



### Supercomputing

Our scientists are cracking the code on opioid addiction using Summit, one of the world's fastest supercomputers, to perform immense calculations on genomic data. Summit provides unique multi-precision computing capabilities that are ideal for artificial intelligence and machine learning applications.



## About the National Security Sciences Directorate

ORNL's National Security Sciences Directorate (NSSD) is committed to creating a world where countries can safely take advantage of the many benefits of nuclear energy, our nation can withstand any nefarious attack on critical assets, and individual communities are stronger and more resilient in the face of disaster.

From climate change and cyber attacks to nuclear proliferation and critical infrastructure vulnerabilities, the threats to America's national security continue to evolve and emerge at a rapid pace. To effectively counter those threats—and protect our nation—we must increasingly turn to science, to the technologies and innovations that underpin our defenses.

NSSD is rapidly advancing the science of resilience, security, and analytics to solve critical challenges in nuclear security, cybersecurity, and human security. Our world-leading researchers engage in collaboration across the Laboratory—in areas such as nuclear and chemical sciences, applied materials, advanced manufacturing, biosecurity, transportation, and supercomputing—to protect the nation today while identifying and addressing future threats.

### REAL-WORLD IMPACTS



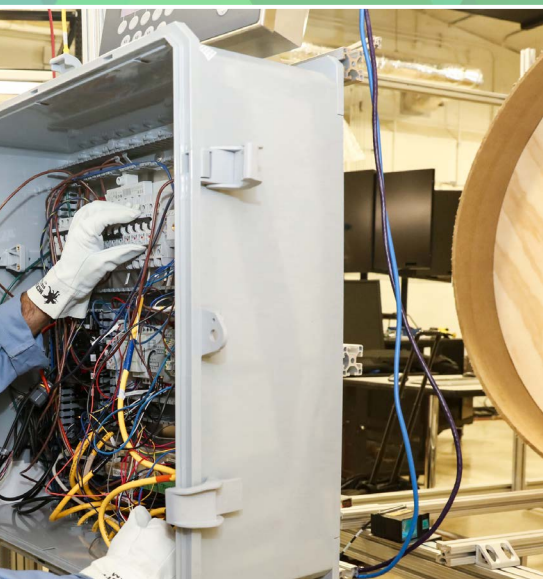
We pioneered a data fusion approach that makes it easier to monitor nuclear reactors for nonproliferation and safety purposes, ensuring nuclear materials are only used peacefully.



We're making it easier for security analysts to more quickly respond to cyberattacks on critical economic and national security systems, reducing crucial analysis time from months to days.



Our data analysis, modeling, and forecasting capabilities provide near-real-time information to assist federal agencies in emergencies.



The National Security Sciences Directorate is home to scientific leadership in these critical areas:

- The **Nuclear Nonproliferation Division** develops and implements nuclear collection and detection technologies, advances scientific understanding of the nuclear fuel cycle, and strengthens international safeguards and nonproliferation regimes. From basic and applied research to technology development and operational tradecraft, our science enables the peaceful use of nuclear materials around the globe.
- The **Cyber Resilience and Intelligence Division** researches innovative methods to identify, analyze, and defend against vulnerabilities in critical infrastructure—from the energy grid and manufacturing supply chains to the Internet of Things devices—while developing advanced sensors and software tools to help intelligence analysts better understand and characterize our adversaries.
- The **Geospatial Science and Human Security Division** integrates human dynamics, geoinformatics, data sciences, autonomous systems, and resilient communications to advance human security in communities around the world. Our research provides decision-makers with timely information on critical situations arising from geopolitical instability, natural disasters, resource scarcities, and health crises.
- The **Field Intelligence Operations Division** conducts, supports, and oversees all classified, intelligence-related research at ORNL. Our researchers and analysts provide government officials with insights on the nuclear and uranium fuel cycles, and our operations teams sustain ORNL's classified research infrastructure to enable a wide variety of national security R&D.

#### AT A GLANCE



16 National Security research labs and test beds



60+ federal partners



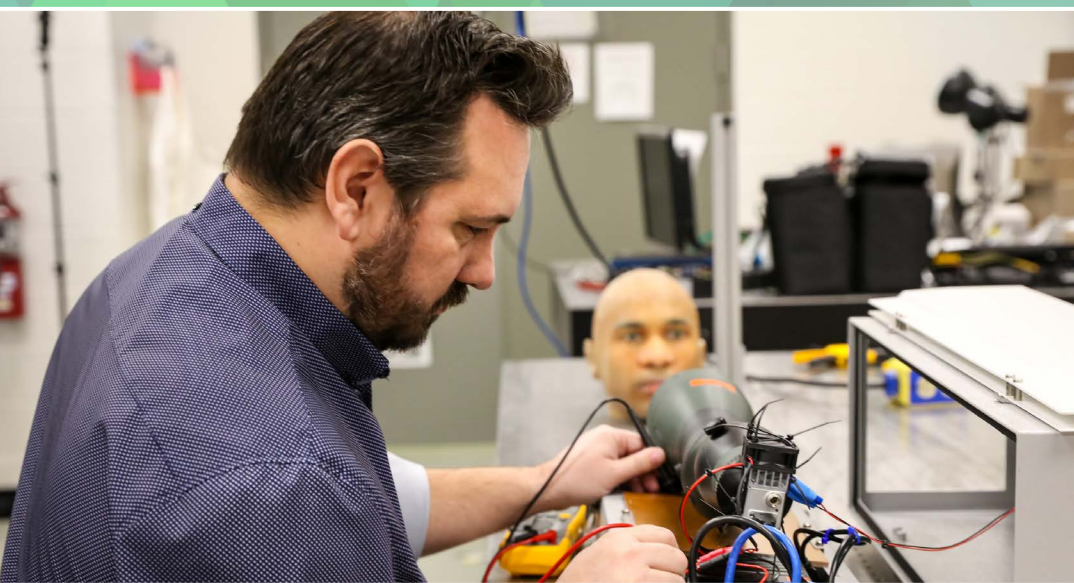
20 US critical infrastructure datasets



100+ countries aided in nuclear nonproliferation activities

In addition, NSSD's National Security Program Office and Nonproliferation Program Office collaborate with partners across ORNL to manage national security R&D projects and deliver scientific solutions to our national security sponsors.



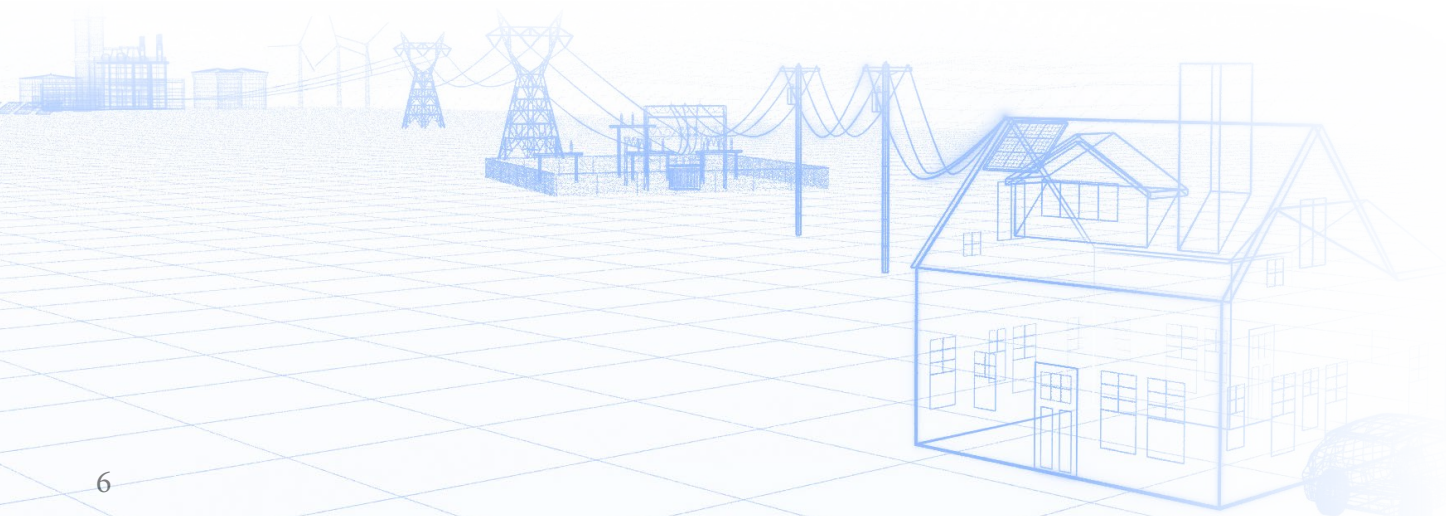


## Securing the Nation

Over the 75-year history of Oak Ridge National Laboratory, we have established global leadership in the sciences and technologies that underpin nuclear nonproliferation, counterproliferation, and counterterrorism. More recently we have pioneered applications based on geospatial sciences, cybersecurity, data analytics, advanced manufacturing, energy systems, and materials science to meet critical national security needs.

### Ten-Year Vision

NSSD's vision is to rapidly advance science-based solutions to mitigate dynamic national security threats, outpace our adversaries, and protect America. We are integrating ORNL's broad science and technology capabilities to deliver superior solutions that increase the resilience of critical cyber-physical systems, protect existing nuclear materials and prevent further proliferation, and advance human security in communities around the world. Moreover, the Laboratory's unique infrastructure, diverse capabilities, and legacy of national problem-solving position us to address future security challenges.







## Community, Culture, and Total Rewards

The strong partnership between DOE and ORNL contractor UT-Battelle, LLC, has created a national resource that draws outstanding researchers in a wide range of disciplines to world-class facilities where they tackle fundamental scientific challenges, couple discoveries with applied research, and work with industry to translate results into commercial applications. The work of the laboratory is being performed safely and efficiently in a modern campus setting. Throughout the region, ORNL is regarded as a high-value asset for innovation, education, and economic development.

### Discover East Tennessee

East Tennessee offers a variety of resources and experiences ranging from mountains, rivers, lakes, and a full menu of outdoor adventures to championship college teams and minor-league baseball to the arts and culture of Knoxville, including the internationally recognized [Big Ears Festival](#). The city is recognized as one of the country's best places to live, in part thanks to its [Urban Wilderness](#) system linking residential and commercial areas with the great outdoors. ORNL is within a day's drive of 50 percent of the nation's population and all of the East Coast's major cities.

### Our Workforce

ORNL is a great place to chart your own research course, work with like-minded colleagues, and build an extraordinary career. With more than 5,800+ employees representing more than 60 countries, we assemble teams of experts from diverse backgrounds, equip them with powerful instruments and research facilities, and address compelling national problems.

In addition, ORNL offers professional development training at no cost to employees, provides professional networking opportunities, and sponsors employee resource groups that support diversity and inclusion efforts across the lab.

### Diversity and Inclusion

ORNL's ability to build and sustain a highly skilled workforce in a rapidly changing competitive environment for talent is greatly influenced by our ability to plan and forecast workforce needs and promote diversity. Maintaining an inclusive environment is a business imperative that focuses on people in all areas of the laboratory and on maximizing the unique talents of individuals, teams, and business partners to pursue world-leading scientific impact.

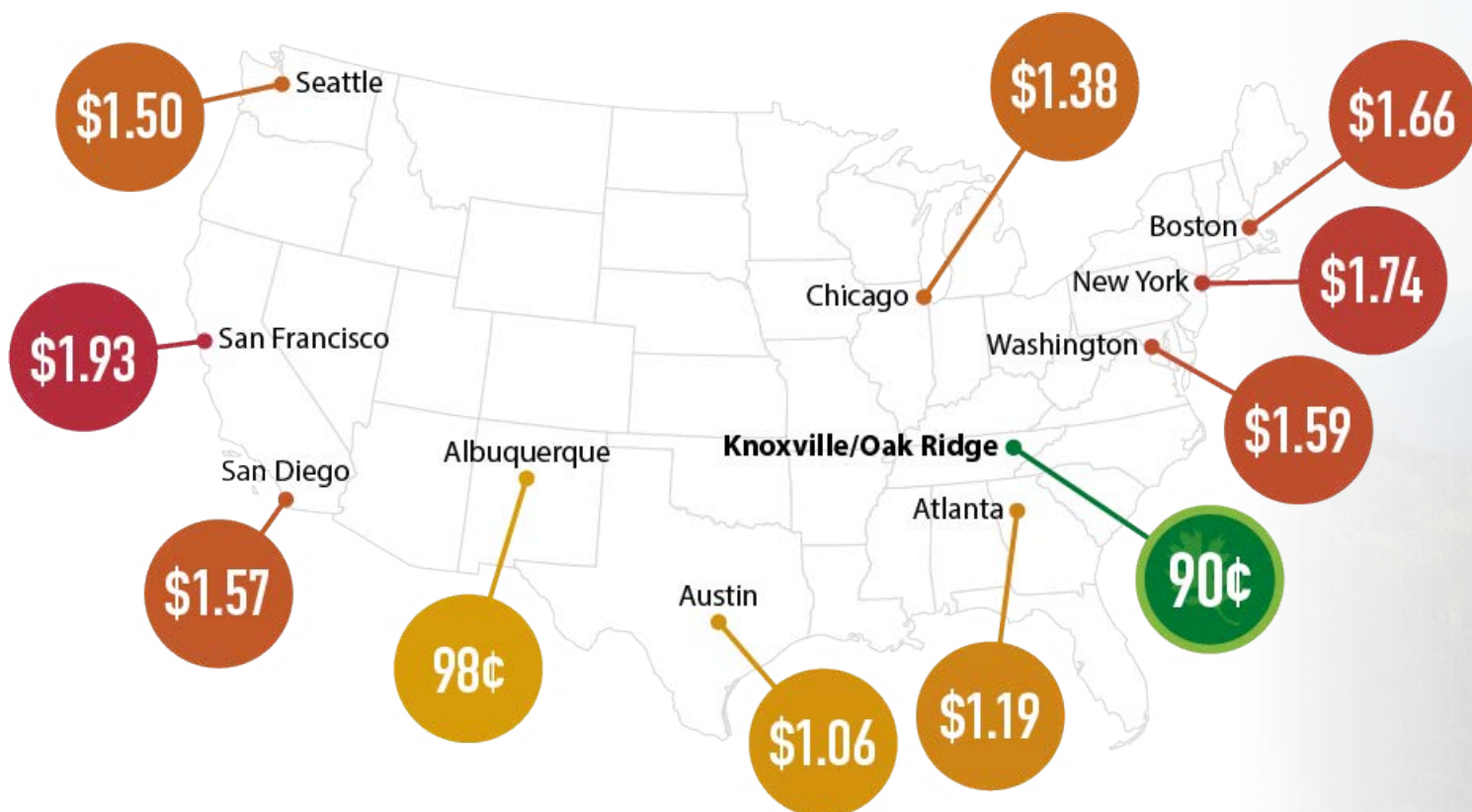
### TOTAL REWARDS

-  401(k) Retirement Plan
-  Generous Vacation and Holidays
-  Pension Plan
-  Parental Leave
-  Medical Plan (Dental, Vision, and Health Savings Accounts)
-  Employee Assistance Program
-  Wellness Programs
-  Employee Discounts
-  Flexible Working Hours
-  Life Insurance
-  Educational Assistance
-  Disability Benefits
-  Relocation Assistance
-  Legal Insurance with Identity Theft Protection



## Cost of Living

The Total Rewards provided by ORNL go much farther than many other locations around the United States. This is because Tennessee has no state income tax, which provides our employees with more take-home pay, and East Tennessee is affordable, with a cost of living 10% lower than the national average.



Source: Economic Research Institute Data. 1/1/2022





## We Welcome Your Application

Our challenge now is to sustain our leadership and build on our success. Thank you for your interest in ORNL and how we are helping to address some of the big science challenges facing our nation and the world.

## Apply Today

Apply at [jobs.ornl.gov](https://jobs.ornl.gov)

### Equal Employment Opportunity

ORNL is an equal opportunity employer committed to a diverse and inclusive workplace that fosters collaborative scientific discovery and innovation. All qualified applicants, including individuals with disabilities and protected veterans, are encouraged to apply.





## CONTACT

[ORNLRecruiting@ornl.gov](mailto:ORNLRecruiting@ornl.gov)

or call 1-866-963-9545

Oak Ridge National Laboratory is managed  
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U.S. DEPARTMENT OF  
**ENERGY**



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