Careers in Energy Science & Technology

at Oak Ridge National Laboratory

OAK RIDGE National Laboratory

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Oak Ridge National Laboratory

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AT A GLANCE

1943 Established in as part of the Manhattan Project

$2.2B annual budget

9 national user facilities

5,400 employees

3,200 visiting scientists

221 R&D 100 Awards

2 Nobel Prize winners

46 National Academy members

17 UT-ORNL Governor's Chairs

9 university core research partners

9 new elements discovered

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 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 2021.
- **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 U.S. 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.

Advanced 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.

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.

Neutron Science

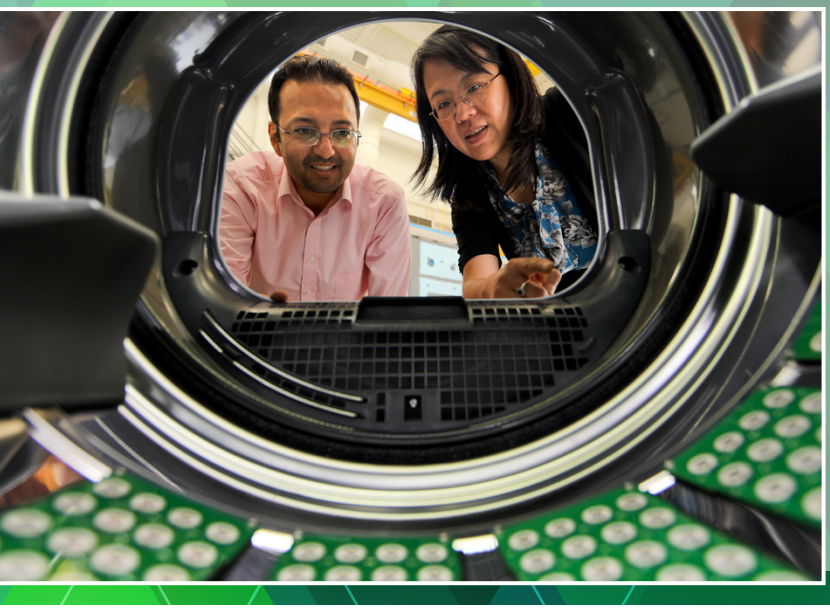
We use neutrons to directly observe battery behavior in pursuit of safer, more reliable energy storage and extended battery life, to study the behavior of drugs in combating disease, and much more.

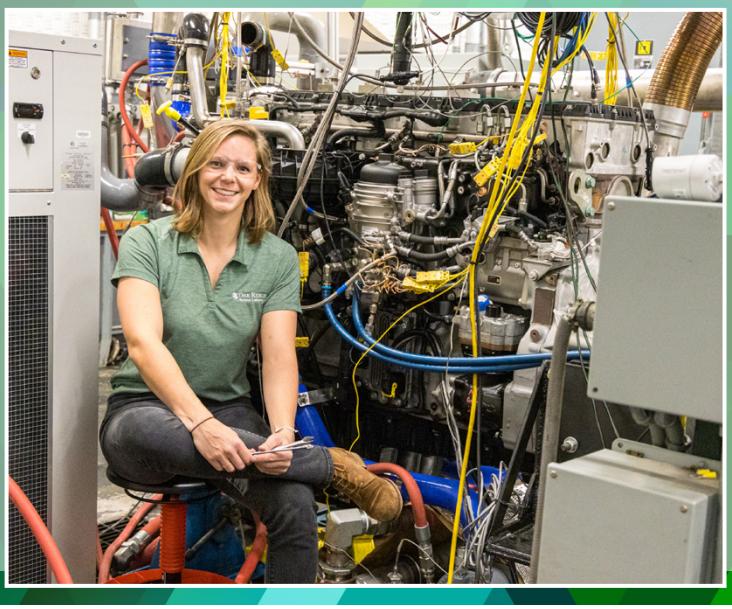
Nuclear Science

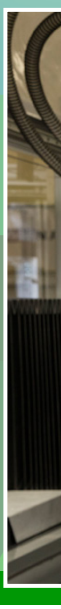
A multidisciplinary team is printing a microreactor to help industry address high costs and lengthy deployment timelines that threaten the future of nuclear energy—the nation's largest carbon-free energy source.

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 Energy Science & Technology Directorate

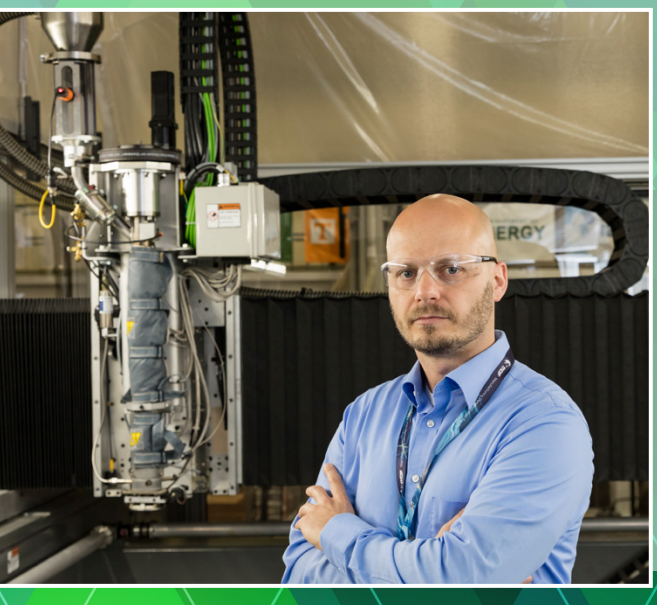
The Energy Science and Technology Directorate (ESTD) plays a pivotal role in America's energy transformation into a clean, efficient, flexible, and secure energy future. Our researchers deliver breakthroughs in energy from generation to distribution and storage to end use in support of Department of Energy missions. ESTD offers a unique culture of entrepreneurship for translating science into solutions for the most critical problems facing society at the nexus of energy and security.

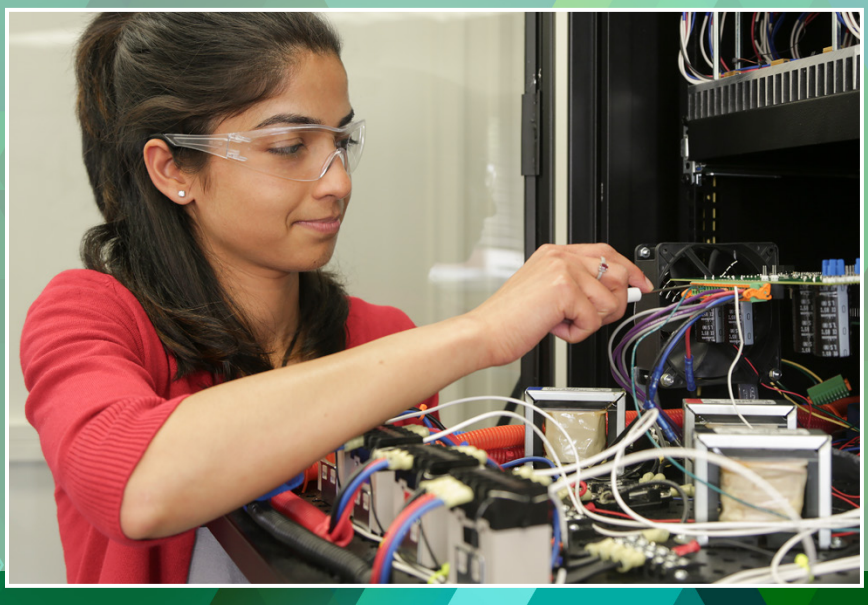
Our scientists and engineers work with many of America's best innovators and businesses to research, develop, and deploy cutting-edge technologies and to break down market barriers in sustainable transportation, smart power systems, and energy efficiency for homes, buildings, and manufacturing. Accelerating clean energy technologies development to deployment cycle will help provide affordable and reliable energy to support a thriving economy.

We bring a multidisciplinary focus to increase understanding of integrated and complex energy systems and to resolve some of the biggest challenges in energy. We are developing new materials for automobiles, buildings and wind turbines, innovating manufacturing processes to drive U.S. economic competitiveness, and devising controls for a secure and resilient power grid.

INNOVATIVE SOLUTIONS FOR CLEAN ENERGY

ESTD is home to four DOE national user facilities dedicated to delivering clean energy innovations. The Building Technologies Research and Integration Center and the National Transportation Research Center develop breakthroughs to improve the energy efficiency of the buildings and transportation sectors. The Carbon Fiber Technology Facility supports technology development and commercial deployment of carbon fiber. The Manufacturing Demonstration Facility focuses on early stage technologies improving the energy and material efficiency, productivity, and competitiveness of American manufacturers. In addition, ORNL's Grid Research Integration and Deployment Center drives the development of advanced components to enable a secure and resilient power grid.





The Energy Science and Technology Directorate spans three research divisions to advance science, engineering, and technology that helps provide affordable, reliable energy in support of a thriving economy.

- The **Buildings and Transportation Science Division** delivers scientific discoveries and technological breakthroughs to accelerate transformative building- and transportation-related technical solutions to ensure a safe, secure, and sustainable energy future. This includes the integration of multi-disciplinary science and technology with state-of-the-art facilities including ORNL leadership science in high performance computing, material science, neutron science, and manufacturing. The BTSD is also home to the only DOE-designated user facilities on building technologies and transportation science.
- The **Manufacturing Science Division** focuses on the development and implementation of next generation advanced manufacturing technologies through research and scale-up of new processes and technical capabilities enabling new materials, systems and products. The division is comprised of personnel from a broad spectrum of manufacturing technology backgrounds integrated with world class manufacturing facilities enabling "Placed Based Innovation".
- The **Electrification and Energy Infrastructures Division** focuses on developing innovative capabilities for electric energy devices and systems to improve the reliability, sustainability, and efficiencies of energy storage systems, electric grid protections and controls, and advancements in power electronics. The division comprises internationally recognized staff who possess expertise encompassing nearly all areas of applied science and engineering.

AT A GLANCE

328 scientists and engineers (Oct. 1, 2020)

$296 million R&D budget (FY19)

37 research groups (Oct. 1, 2020)

2015–2019

1,098 journal publications

501 invention disclosures

130 patent applications

129 issued patents

39 patent licenses

93 cooperative research & development agreements

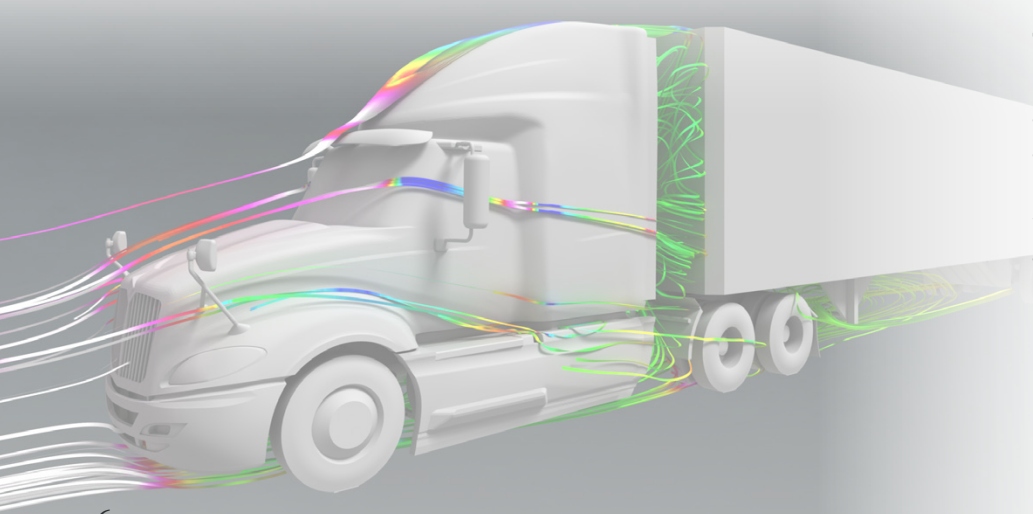
84 strategic partnerships

Pioneers of Energy Innovation

Today's energy systems pose an array of scientific challenges, from the environmental impacts of energy generation to inefficiencies in end use and a need for more secure and resilient power delivery. We advance clean energy innovations through an integrated systems approach, enabled by digital infrastructure, building on ORNL's world-class capabilities in materials science, high-performance computing, and neutron scattering to translate fundamental science discoveries into practical energy-saving technologies.

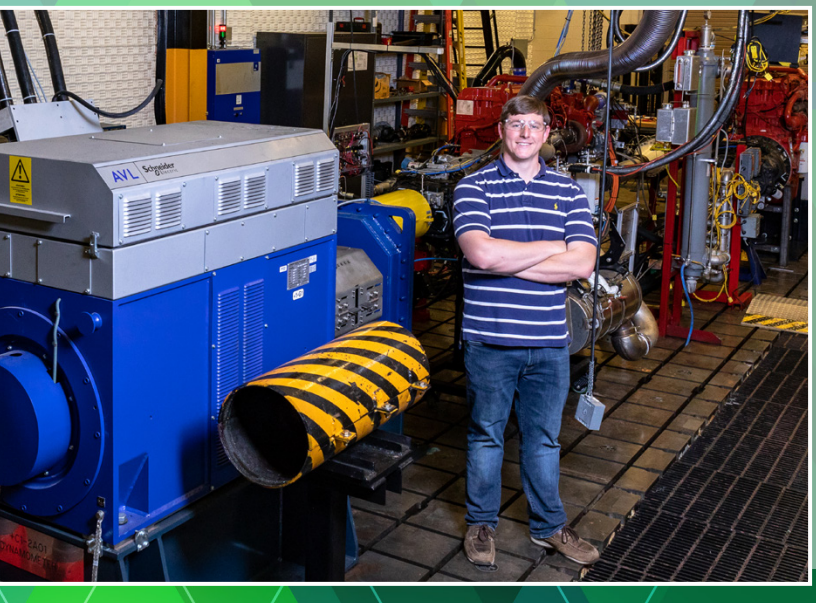
Researchers collaborate across disciplines, bringing a diversity of expertise to bear on energy challenges and leveraging the unique DOE user facilities and state-of-the-art equipment housed at ORNL. Whether it is advances in fast wireless charging for vehicles, novel catalysts that convert carbon dioxide into ethanol, transactive controls for smart neighborhoods or additive manufacturing of nuclear reactors, we deliver breakthroughs across the energy spectrum.

Our integrated energy systems approach focuses on creating decarbonization, electrification and autonomous solutions for transportation; enabling smart, grid-interactive and resilient buildings and neighborhoods; revolutionizing manufacturing and secure supply chains through digital, secure, integrated and autonomous systems; and developing secure, sustainable, and resilient energy infrastructure.



Ten-Year Vision

Over the next decade, we will lead transformational science and technology to enable the flexible, secure, and autonomous energy systems of the future. We will provide power and fuel originating from a variety of sources in a clean and seamless manner.



Lab of the Future

In May 2020, we launched an internal initiative to strategically expand opportunities for scientific leadership aligned with growth in key programs, mission needs, and emerging research areas. As part of the effort, ORNL's Leadership Team considered how to sustain global leadership in research and development, a relentless pursuit of operational excellence, and an inclusive environment that fosters innovation, creativity, and collaboration.

Our goal is to serve the nation as the world's premier research institution, empowering leaders and teams to pursue breakthroughs in an environment marked by operational excellence and engagement with the communities where we live and work.

We're seeking passionate leaders who will help us become the world's premier research institution.

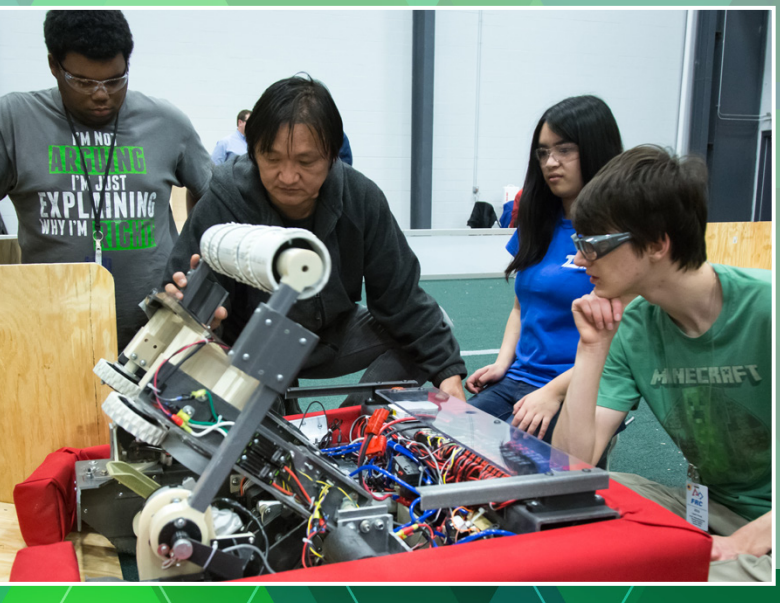
Join Us!

ORNL's research groups and sections are the building blocks of a premier research institution and will focus on the disciplines essential to our missions and to leadership in emerging fields. We're creating new, focused teams to accelerate leadership in core capabilities identified by our sponsors, partners, and research staff.

- New ***Section Heads*** will provide R&D leadership to groups in common thematic areas, set consistent expectations, coordinate across disciplines, and help to align the activities of groups with the vision of the directorate and the Lab as a whole.
- New ***Group Leaders*** will sustain individual excellence in research and development while building a group of peers who pursue global leadership and exemplify ORNL's commitment to solving some of the world's most difficult problems.

Leadership Opportunities in Energy Science & Technology

- Propulsion Science
- Vehicle and Mobility Systems
- Building Technologies
- Energy Efficient Manufacturing Science
- Precision Manufacturing and Machining
- Digital and Secure Manufacturing
- Electrification
- Energy Systems Integration and Controls
- Energy Sensing, Analytics and Communications



Community and Culture

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 5,400 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.

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

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