Thank you for your interest in an internship at ORNL for Summer 2026

How to use this document

The pages below list 92 scientists who responded positively to a request to host Duke students in the summer of 2026 for an internship. They are sorted by *Directorate*, which is ORNL's highest level of organization, more or less equivalent to a college at most universities. (You can learn more about each directorate by visting the ornl.gov web site and clicking on a directorate under the "science areas" tab. We encourage you to look these over and find a few that you think would be most attractive to you for a summer internship position.

Participation in this program does not preclude you from applying to ORNL in the same fashion as students from all over the world. You are welcome to learn more about the ordinary internship application processes at education.ornl.gov.

Biological and Environmental Systems Science Directorate (BESSD)

Daniel Jacobson (#04)

Distinguished Research Scientist, Computational Systems Biology

My work focuses on using supercomputing and artificial intelligence/machine learning (AI/ML), including AI-agent workflows and reinforcement-learning for large language models, to understand complex biological systems. We study how small molecules, epigenetics, genes, proteins, and cells interact to form molecular mechanisms and regulatory circuits across a wide range of organisms, including plants, microbes, bats, mice, fruit flies, nematodes, fish, frogs, crustaceans, and humans. I lead a large multidisciplinary research team that develops computational methods and models and analyzes massive multi-omic datasets to uncover the molecular drivers of traits such as disease, stress tolerance, and drug response. We build and apply tools that integrate AI/ML, multiplex network science, and supercomputing to detect patterns that would be impossible to identify otherwise. Our work supports major DOE, NIH, VA, and NSF goals by enabling the design of improved bioenergy crops, deepening our understanding of environmental processes, and accelerating biomedical discovery. Students working with us gain hands-on experience at the intersection of biology, data science, and advanced computing. We have built the largest multiplex biological networks ever constructed and performed the fastest scientific calculation in human history as part of this research.

Brian Sanders (#07)

Staff Scientist R&D

Focus is synthetic chemistry, biochemistry, and bioinorganic chemistry (metals in biology) and research projects are at the interface of chemistry and biology, leveraging small molecules, proteins, and bacteria to better understand and control biological processes. Current research spans from quantifying microbial communities, recovery of critical minerals and materials from waste, quantum sensing interfaces to biology, and biomedical research involving antiviral and targeted radioisotope therapeutic development.

Joshua Birkebak (#12)

Technical Professional in Soil and Ecosystem Science

I work on the technical aspects of executing national lab science through coordinating field campaigns, developing laboratory methods, applying novel techniques, and working on the logistics of sample and data management for high-impact, collaborative, interdisciplinary, large-scale experiments. I work predominantly with the Terrestrial Ecosystem Science Scientific Focus Area (TES-SFA; https://tes-sfa.ornl.gov/) on the one-of-a-kind SPRUCE whole ecosystem manipulation experiment (https://mnspruce.ornl.gov/) among other projects. I am interested in hosting one or two students in the summer of 2026 working on laboratory as well as sample and data management projects. The specific scope of an internship project is somewhat flexible as long as it aligns with the needs of the project but could include working with soils (including peat), vegetation, nutrient analysis, elemental analysis, laboratory method comparisons, data management, sample management, etc.

Daniel Ricciuto (#21)

Group Leader, Earth Systems Modeling

I work on modeling the Earth System with a primary focus on improving predictions of feedbacks from the land-surface, including modeling of carbon, water, energy and nutrient cycles. This includes numerical representation of soil and vegetation processes. Our group improves land-surface models by including new processes and using observations and experiments to calibrate model parameters. We are increasingly using machine learning/AI to improve model/data integration.

Ryan Jacobson (#24)

Research Associate

I study how renewable energy and natural resources can be produced, moved, and used efficiently, with a particular focus on bioenergy systems. My work blends economics, logistics, and environmental science to understand how fuels and materials flow across landscapes and how those flows can support cleaner, more resilient energy futures. I use tools such as Python, Julia, Fortran, GIS, and remote sensing to collect, process, and model large datasets that describe supply chains, land management, and energy production. This research supports national goals for expanding sustainable bioenergy while improving wildfire mitigation and forest restoration efforts.

A potential Summer 2026 project could involve helping build or analyze geospatial supply-curve models for biomass resources using Python and GIS. Preferred preparation includes prior coursework or experience in programming and basic data analysis.

Tomas Allen Rush (#30)

Staff Scientist

I am a research scientist in the Biosciences Division at Oak Ridge National Laboratory, where I study fungi, plant diseases, and the chemical signals that shape how microbes interact with plants. Much of my work focuses on bioenergy crops like poplar and switchgrass, using tools from systems biology and modern “omics” technologies to understand how both beneficial and harmful fungi influence plant health. I also investigate plant and human

pathogens to uncover how infections begin, how hosts respond, and how diseases spread. By combining laboratory experiments with computational approaches, including machine learning and network analysis, I aim to identify the environmental cues that drive fungal metabolite production, supporting DOE goals in agriculture, bioenergy, and sustainable biomaterials.

For a Summer 2026 project, a student could help characterize chemical signaling in a beneficial plant–fungal system using microscopy and basic genomics workflows. Preferred qualifications include prior coursework in microbiology or molecular biology and an interest in fungi, plant biology, or computational data analysis.

Tao Yao (#33)

Technical Professional

My research investigates plant genetics and genomics using the model woody plant Populus. By integrating plant physiology, molecular biology, and biochemistry, we explore gene functions in plant development and stress responses.

Yunqiao (Joseph) Pu (#34)

Sr. R&D Staff

Biomaterials and biomass characterization, plant chemistry, phytomining of critical materials and minerals, bioenergy.

Christopher Schadt (#39)

Distinguished Scientist

Christopher Schadt an environmental microbiologist and Distinguished Scientist in the Biosciences Division at Oak Ridge National Laboratory with expertise in the influence of microorganisms (bacteria, fungi and archaea) on biogeochemical cycles in soils and sediments, as well as their interactions with plant community members and crops. Additionally he has interest and expertise in development of molecular methodologies to track the distributions and activities of microorganisms across these environments. Information on Dr. Schadt's research and projects can be found on his ORNL homepage - https://www.ornl.gov/staff-profile/christopher-warren-schadt

Christian Mark Salvador (#56)

Aerosol Science and Technology Research Staff

Dr. Christian Mark Salvador is an environmental and atmospheric chemist with a wide range of experience in understanding the formation of atmospheric pollutants. His main focus is to comprehend the impact of anthropogenic emissions on the atmospheric conditions of biogenic environments such as marine and forest regions. Dr. Christian was involved in several international collaborative studies where he utilized online and continuous mass spectrometric techniques to probe the transformation of volatile organic carbons (VOCs) in both indoor and outdoor environments.

Xiaohan Yang (#59)

Distinguished Scientist

My research focuses on plant synthetic biology and predictive biosystems design to engineer plants that address national challenges in critical materials, bioeconomy, and biosecurity. We utilize a multidisciplinary approach combining biotechnology, artificial intelligence, and multi-omics data integration to rationally design and optimize complex plant traits. By developing automated "Design-Build-Test-Learn" workflows, my team accelerates the creation of resilient crops capable of efficient biofuel or bioproduct production and phytomining, directly supporting the Department of Energy's mission to secure clean energy and critical materials.

For Summer 2026, a student project involves the application of AI-aided plant synthetic biology to plant bioengineering for biosensing, in-planta polymer production, or phytomining of rare earth elements (REEs). Students with a background in molecular biology, genetics, or computational biology are encouraged to apply.

Priya Ranjan (#67)

Senior Scientist

I work at the intersection of plant genomics, microbiome science, and AI, focusing on how large-scale biological data can help us understand and improve bioenergy crops like Populus. My work combines genome and transcriptome analysis, phenotyping, and machine learning with advanced data-engineering systems such as Delta Lakehouse architectures and AI-powered research agents. I build tools and models that help scientists connect genes, microbes, and environmental conditions to plant traits, to support DOE’s goals in sustainable bioenergy and environmental resilience.

A Summer 2026 student may work on an AI-assisted analytics pipeline that links genomic features and seasonal gene expression to trait prediction or CRISPR target nomination. Helpful skills include basic Python, interest in biology or data science, and curiosity about how AI accelerates scientific discovery.

Jeff Warren (#68)

Senior Staff Scientist

My research focuses on plant ecophysiology, e.g., how plants respond to their environment. My research spans plant physiology, soil-plant water relations and ecosystem function, and how cascading effects are exhibited at higher trophic and scalar levels. I also study urban energy balance, and is involved with neutron imaging of soil hydrodynamics and root rhizosphere biogeochemical and hydrological exchanges.

Jiafu Mao (#80)

Senior Research Scientist

My research focuses on quantifying and predicting vegetation, hydrology, carbon cycling, and wildfire dynamics within the Earth system. I integrate field measurements, satellite observations, process-based land surface and Earth system models, and advanced statistical methods, including machine learning and artificial intelligence. A key aspect of my work is understanding and attributing variations and extremes in land surface processes to both natural and anthropogenic drivers, such as urbanization, using factorial model simulations and geoengineering

experiments. I also study fire–grid interactions, with a particular emphasis on analyzing and modeling feedbacks between wildfires and power infrastructure, and developing strategies to mitigate wildfire risks to critical systems. In parallel, I am advancing research on Carbon Dioxide Removal (CDR), focusing on Enhanced Rock Weathering (ERW) and the optimization of its supply chains for integration into Earth system models. In addition to research, I have mentored over 30 students and early-career scientists across disciplines and institutions, and I am deeply committed to fostering interdisciplinary, research-integrated education in environmental science and Earth system modeling.

Harold Shanafield (#92)

Earth Science Database Engineering and Informatics Group Leader

Researchers in the Earth Science Database Engineering and Informatics group at Oak Ridge National Laboratory (ORNL) enable scientific breakthroughs in Earth science by expertly managing environmental data, with a primary focus on the Atmospheric Radiation Measurement (ARM) Data Center and other key environmental research projects at ORNL. Through state-of-the-art technologies and innovative informatics strategies, the team ensures that vast amounts of environmental data are accurate, accessible, and ready to drive impactful research discoveries.

The group provides comprehensive metadata management for the ARM Data Center, ensuring researchers have detailed context about datasets, such as data origins, measurement methods and collection circumstances. High-quality metadata significantly enhances data usability, making complex datasets more accessible and understandable to researchers globally. To further enhance data quality, the group is actively developing artificial intelligence and machine learning techniques, automating and refining metadata creation processes for even greater accuracy and efficiency.

A critical aspect of the group's mission involves designing, developing, and maintaining robust database infrastructure to store, manage, and retrieve enormous volumes of atmospheric and environmental data. The team continually evaluates and implements cutting-edge database technologies, including advanced NoSQL database architectures capable of efficiently processing and extracting insights from petabytes of atmospheric data. These efforts ensure rapid and reliable data retrieval for researchers exploring complex environmental phenomena.

Computing & Computational Sciences Directorate (CCSD)

Richard Messerly (#13)

Computational Scientist - Machine Learning in Chemistry and Materials

As a computational scientist in the Oak Ridge Leadership Computing Facility (OLCF), my research focuses on developing and applying machine learning algorithms to study chemical and materials systems on exascale-class supercomputers, such as Frontier. My research addresses problems such as building large datasets of energies and forces computed with expensive quantum chemical methods to train accurate and efficient machine-learning interatomic potentials. My primary research tools are quantum chemistry calculations, molecular dynamics simulations, machine learning techniques, and high-performance computing (HPC) with Graphics Processing Units

(GPUs). My work directly supports DOE goals by accelerating scientific discovery and optimizing the use of the nation's largest HPC systems coupled with Artificial Intelligence.

A potential project for a Summer 2026 student would be to perform fine-tuning tasks with foundation models on specific chemical or materials systems. The preferred qualifications are prior experience with at least one quantum chemistry package (e.g., Gaussian, Vienna Ab Initio Simulation Package (VASP)), one molecular dynamics package (e.g., Large-scale Atomic/Molecular Massively Parallel Simulator (LAMMPS), Atomic Simulation Environment (ASE)), one machine learning package (e.g., PyTorch, TensorFlow), and standard best practices for high-performance computing.

Stephan Irle (#14)

Senior R&D Staff and Group Leader

Stephan Irle's specialty is the quantum chemical study of complex systems with an emphasis on nonequilibrium dynamics. Target areas are soft matter and biosimulations, excited states of large molecules, chemical energy storage, and catalysis. Complementary studies of physicochemical properties, theoretical spectroscopy, and the development of methodologies including approximate quantum chemical methods and machine learning-based solutions for inverse design problems accompany this research. As leader of the "Computational Chemistry and Nanomaterials Sciences" Group at ORNL, my team's mission is to develop and apply scalable quantum chemical simulation software designed specifically for the Department of Energy's leadership class computing facilities, leveraging our expertise in advanced computing, machine learning, and quantum computing. Collectively, these efforts directly advance ORNL programs, enable high-impact science on DOE user facilities, and support broader DOE missions in clean energy, materials design, chemical transformation, and emerging quantum technologies.

Daniel Arndt (#20)

Computational Scientist

Most of my work at ORNL is related to the open source performance-portability library Kokkos. Kokkos provides an API for applications to run on heterogeneous systems without needing to rewrite their source code. The Kokkos ecosystem also provides tools that can be used to introspect Kokkos code (e.g., analyzing power consumption, analyzing memory usage, time spend in certain regions). Student projects can either be related to tooling or improve Kokkos itself.

Guojing Cong (#23)

Senior scientist

My work focuses on AI and HPC methods to advance scientific discoveries. On the AI front, my research focuses on large language models, graph neural networks, and their applications in biology and medicine as well as materials discovery. From the compute perspective, I also work on energy efficiency of AI systems. The tools we use are primarily Python, PyTorch, and occasionally R.

For summer 2026 students, I have several projects that are aligned with my current work:

1. Using AI methods in transcriptomics to re-evaluate In vitro In vivo exploration

2. Develop efficient attention mechanisms for energy efficiency towards new devices
3. alternative graph learning methods for graph classification and regression focusing on speed, accuracy, and energy efficiency
4. multi-model LLM reasoning that brings a scientific mode into LLM. All students should have a strong AI background

For task 1, I would love to work with students that have experience in transcriptomics.

Shaked Regev (#36)

Research Scientist

I work on numerical optimization and numerical linear algebra problems at high performance computing scales in particular for power grid applications. I program primarily in C++ and Julia. The student should have experience programming, preferably in C++ or Julia (if in other languages, they should be willing to learn at least one of these). The student should be familiar with linear algebra, multivariate calculus, and preferably numerical optimization.

1. We're developing a fast, accurate, and novel approach to solve the unit commitment problem on the electric grid. This is the problem of deciding which generators to operate and at what capacity to meet all demand on the electric grid and ensure that the probability of a supply shortfall is limited.

2. The ReSolve package https://github.com/ORNL/ReSolve implements a linear system solver for nonlinear programs. This is essential because it is difficult to solve nonlinear programs directly, but the linear solver is typically the bottleneck for most scientific computing codes.

Sam Reeve (#44)

Staff Scientist

I am a computational scientist with a background in materials science, primarily focused on creating and improving scientific software. We build new software to run on DOE supercomputers, measure and engineer performance, and answer scientific questions with these computational tools. I work in materials, manufacturing, fusion, and fission science at the intersection of mechanics, phase transformations, and plasma physics. If you're interested in a combination of science and programming, reach out!

Alina Peluso (#45)

Research Scientist in Biostatistics

Biostatistics, Machine Learning in Health

Seung-Hwan Lim (#48)

Senior Staff Scientist

My research centers around machine learning over data with complex structures such as graph data, which have been used to describe structural information from various domains such as chemical molecular structures,

programming language, natural language, critical infrastructure, and social network. My primary responsibilities are to develop new algorithms and to discover new insights from data. Although the primary focus is on cases where high performance computing environments can offer significant benefits in order to make the best use of supercomputers hosted by Oak Ridge National Laboratory, my research is not limited to high performance computing. Recently, I have growing interests in using graph learning approaches to improve large language models (LLM) or large vision-language models (VLM) for the understanding of scientific data as scientific data comprises of multiple modalities data such as text description, numerical measurements, and imagery data. I prefer students with reasonable computing skills related to python-based machine learning tools such as PyTorch, NumPy, and Scikit-Learn.

Junqi Yin (#51)

Computational Scientist

My research spans HPC and AI, with an emphasis on scalable training and inference for large language models and agentic workflows. I'm seeking self-motivated students who are eager to build cutting-edge systems that advance AI for scientific discovery.

Awais Khan (#62)

HPC Systems Scientist

I focus on high-performance computing (HPC) systems and large-scale data workflows, with an emphasis on how future supercomputers can efficiently train AI models and analyze scientific data. My work explores problems such as storage performance, I/O bottlenecks, and how to design fast, fault-tolerant data movement across massive computing clusters like ORNL's Frontier system. I use tools ranging from parallel filesystems and data caching frameworks to performance profilers and network-aware scheduling approaches. The goal of my research is to make national-scale supercomputers more reliable, more efficient, and better aligned with the Department of Energy's mission to accelerate scientific discovery.

For a Summer 2026 project, I am interested in mentoring a student to analyze performance traces from AI or simulation workloads on Frontier and help design lightweight data-placement strategies to reduce I/O overhead. Students should have experience with Python and Linux; familiarity with parallel programming is a plus but not required.

Swaroop Pophale (#63)

Computer Scientist

My expertise is in HPC programming models, specifically performance portable models for accelerators. My work encompasses helping applications as well as the OLCF facility in defining and realizing software environment design and capabilities.

Students should know C, C++ or Fortran programming along with basics of parallel programming to be able to contribute.

Pablo Seleson (#69)

Research Scientist

I work in computational mechanics with a focus on peridynamics—a technique that uses nonlocal mathematical models and numerical simulations to analyze how materials deform and break. My role involves developing advanced mathematical models, numerical methods, and computational tools, while leveraging state-of-the-art high-performance computing to address mechanics and fracture challenges in areas such as fiber-reinforced composites, nuclear fuels, fusion, and advanced manufacturing.

Van A Ngo (#71)

Computational Scientist

I have used supercomputers as microscopes to investigate the atomic resolutions of many biological systems, such as cellular signaling, lipid membranes, transmembrane proteins which play critical roles in biological functions. Many types of cancers and diseases are caused by some of these systems. I aim to understand the dynamics and key insights into these systems so that we may be able to find ways to combat diseases by developing therapeutic drugs using AI/ML technologies and simulations via our exascale supercomputer Frontier.

Massimiliano (Max) Lupo Pasini (#73)

Data Scientist

I work on developing advanced artificial intelligence models—especially graph neural networks—to accelerate scientific discovery in materials science, computational chemistry, and energy systems. My research focuses on building scalable machine-learning tools that can learn from millions to billions of data samples. At Oak Ridge National Laboratory, I combine high-performance computing, physics-based simulation data, and modern deep-learning methods to support DOE missions in clean energy, advanced manufacturing, and critical-materials security. This work directly impacts flagship ORNL facilities such as Frontier by enabling AI-driven workflows that run efficiently at extreme scale.

For a Summer 2026 project, a student could help develop and test graph-based machine-learning models for predicting the behavior of new sustainable materials or for analyzing resilience in electrical-grid networks. Preferred preparation includes experience with Python and PyTorch for deep learning. We would desire (although not mandatory) expertise in at least one scientific field among materials science, chemistry, and electrical engineering.

Eirik Endeve (#75)

Computational Mathematician

Transport and magnetohydrodynamics (MHD) are central to multiphysics models of magnetic confinement fusion. Students will work on the design and analysis of computational methods for modeling transport and MHD in fusion plasmas, supporting research on the behavior and performance of future fusion devices. Projects integrate physics, mathematics, and computational science.

Jim Nutaro (#79)

Research staff

My focus is on methods and technologies for systems modeling and simulation. This work supports a variety of national security programs across the government. The student should have experience programming with C++ and some experience with multi-threaded programming.

Paul Laiu (#83)

Staff Mathematician

I am an applied mathematician in the multiscale methods and dynamics group at ORNL. My research focuses on the design, development, and analysis of numerical methods and algorithms for solving scientific problems in a variety of application areas including astrophysics, computational fluid dynamics, cybersecurity, health data analysis, and nuclear fusion science. A general objective of my research is to efficiently approximate or estimate outcomes of complex systems. My recent work includes efficient distributed training algorithms for neural networks, multiscale vision transformer architectures for modeling turbulent systems, surrogate modeling and data compression methods for dynamical systems, and numerical solvers for supernova simulations.

Kathleen Hamilton (#85)

Research Scientist

My research focuses on developing algorithms and applications for near-term quantum hardware. At the algorithmic level there is substantial research efforts needed to design optimal hybrid workflows for scientific applications. At the hardware level my research focuses on developing informative benchmarks and characterization tests that allow end uses to assess and understand how noise affects overall performance. This work synthesizes expertise in physics, computational methods, statistics and machine learning.

Stefan Schnake (#88)

Mathematician

At Oak Ridge National Laboratory, I focus on accurate compressions of high-dimensional dynamical systems that are commonly found in plasma physics applications, optimal control, and neural network training. Artifacts of my research include practical algorithms for use in the advancement of the DOE mission as well as numerical analysis showing the stability and high-order accuracy. Students should have a background in numerical analysis, differential equations, and linear algebra.

Energy Science & Technology Directorate (ESTD)

Matthew Korey (#10)

R&D Staff

Matthew Korey specializes in the development and industrialization of novel, sustainable manufacturing technologies for plastics and their composites. His work focuses on mechanical, chemical, biological, and thermochemical methods of composite recycling and the use of advanced re-processing techniques and repurposing to recycle industrial composites waste.

Dipti Kamath (#17)

R&D Associate Staff

Dr. Dipti Kamath is an R&D Associate Staff Member in the Manufacturing Energy Efficiency Research & Analysis Group at ORNL. At ORNL, Dipti works on the techno-economic and life cycle assessment of emerging technologies for industrial transformation, especially for the pulp and paper sector. She also serves as a Technical Account Manager for the DOE Better Plants program. Dipti's research interest has been in sustainable energy systems, material efficiency, and alternative fuels. Dipti received her Ph.D. in Environmental Engineering with dual major in Environmental Science & Policy from Michigan State University; she received a Master of Technology in Environmental Engineering from the Indian Institute of Technology Delhi, and a Bachelor of Technology in Civil Engineering from the University of Calicut.

Komal Chawla (#35)

chawlak@ornl.gov

My work focuses on developing next-generation digital manufacturing workflows for polymer composites, addressing the complex challenge of predicting a composite's manufacturability and performance. I combine advanced computational tools with experimental methods to analyze microstructure, fiber orientation, and porosity, supporting ORNL programs in high-precision, energy-efficient materials production. Central to this effort is a Microstructure Software package, which models material behavior at the microscopic level, and a Large Language Model (LLM)-driven AI Assistant, which interprets simulation results, predicts design flaws, and generates optimized process parameters. By integrating cutting-edge modeling with AI-driven automation, this work advances intelligent digital control for high-performance composites.

I am enthusiastic about hosting a Summer 2026 student and providing hands-on experience in advanced materials modeling, AI-driven process optimization, and digital manufacturing workflows. This project offers a unique opportunity for a student to engage with cutting-edge tools and gain exposure to both computational and experimental approaches in polymer composite research. I welcome applicants who are motivated, curious, and eager to develop skills in engineering simulations, and AI-assisted design-for-manufacture.

A Summer 2026 student would have the opportunity to learn advanced material modeling by running Microstructure Software simulations, develop AI-driven process optimization skills by refining the LLM interface, and gain experience in integrating simulation outputs with AI tools for autonomous design recommendations. Ideal candidates should have programming experience (Python, VS Code) and an interest in computational modeling.

Xiao Hu (#41)

Computational & Instrument Scientist

I am a neutron diffraction instrument scientist at the HB-2C Wide-Angle Neutron Diffractometer and computational scientist at HB-3A Dimensional Extreme Magnetic Neutron Diffractometer in the High Flux Isotope Reactor, ORNL. My major job duty is to support users from all over the world with experiment setups, data acquisition, data reduction, and data analysis. My research interests are in experimental condensed matter physics with a particular focus on correlated electron systems, such as cuprate superconductors, quantum magnets, Dirac/Weyl semimetals, and optoelectronic materials.

Narayan Bhusal (#42)

R&D Staff

1. Power System
2. Data Science

Power system resilience and reliability, data-driven outage analytics, AI/ML applications in power systems, and intelligent grid automation.

Pum Kim (#57)

Senior R&D Scientist

Problems I work on: Bridging machine learning and simulation with manufacturing

Primary objective: Smart manufacturing framework development for high efficiency production

Tools/systems/technologies used: Artificial Intelligence (Deep learning, LLM), Computational analysis methods for mid to large scale behaviors (millimeter- to meter-scale).

Impact of my work on ORNL & DOE: Help boost US economy through manufacturing innovation.

Students must have hands-on experience in developing AI (any kind), computational simulations, or algorithm development.

Bo Shen (#70)

Senior Research Scientist

Dr. Shen is a senior research staff in Oak Ridge National Laboratory. He joined ORNL in 2010 and focuses on development high efficiency heat pumps, e.g. cold climate heat pumps, multi-functional heat pumps, heat pump water heaters, and low GWP refrigerant transition, etc. For the past 16 years, he has been developing the DOE/ORNL Heat Pump Design Model and supporting the user base, which includes many US manufacturers and academia.

Amir Ziabari (#95)

Senior R&D Staff

My research focuses on computational imaging and generative AI for scientific imaging, with applications spanning X-ray computed tomography (CT), electron tomography and other advanced imaging modalities. I develop physics-

informed reconstruction methods and deep generative models (such as diffusion models) that can both create realistic synthetic imaging data and serve as powerful priors to improve image quality from sparse, noisy, or limited measurements. A key part of my work is building AI tools that enable fast, reliable, and quantitative characterization of materials and components from complex 2D and 3D imaging data. These capabilities support ORNL and DOE missions in advanced manufacturing, nuclear energy, and materials discovery by accelerating non-destructive evaluation and reducing the time and cost of experiments.

A Summer 2026 student could help develop and evaluate generative AI models that synthesize realistic X-ray CT or related scientific imaging data, and then integrate these models as priors in reconstruction pipelines to enhance defect detection and image quality from sparse-view scans.

Environment, Safety, Health, and Quality Directorate (ESH&Q)

Lori Manis (#55)

Safety and Operations Services Division Group Leader

2026 opportunities include field experience opportunities in industrial safety and industrial hygiene exposure evaluation and sampling activities during work performed at a world-class R&D laboratory.

Brittany Niequist (#82)

NEPA/Cultural Resource Specialist

I work as a Cultural Resource Specialist at Oak Ridge National Laboratory, focusing on the preservation and management of historical and cultural assets within the lab's diverse environment. My responsibilities include conducting field surveys, coordinating with archaeologists and historians, and ensuring that all activities comply with federal and state preservation laws while supporting ORNL's research endeavors. I employ methods such as site analysis, archival research, and cultural impact assessments to balance ongoing scientific innovation with respect for our heritage. For Summer 2026, I plan to guide a project that investigates the historical significance of specific sites within the lab's footprint, and I encourage students with interests in archaeology, history, or cultural resource management to apply. A background in geospatial mapping (GIS) is especially helpful.

Facilities & Operations Directorate (F&O)

Eric Brewer (#01)

Fabrication Complex Facility Manager

The goal of the ORNL Fabrication Complex is to support the research mission of the Laboratory. Our diverse capabilities span a broad spectrum of engineering disciplines, enabling the Laboratory to explore fundamental science challenges and to carry out the research needed to accelerate the delivery of solutions to the marketplace. Our specialty is performing one off builds that can include any of the fabrication staff (Machinist, Welding, tight tolerance Pipefitting, Millwright, Boilermaker, Sheet Metal, and Paint/Sign). We specialize in the most difficult and complex fabrications. We bring concepts to reality.

Janna Nash (#06)

GIS Engineer

As a GIS Engineer, I manage and maintain authoritative geospatial data for eight utility distribution systems across a large, campus-style facility. I use ArcGIS Pro, ArcGIS Dashboards, Experience Builder, and Field Maps to support a wide range of operational needs—from real-time field data collection to interactive visualization and reporting. My work serves as the central spatial reference for maintenance crews, planners, emergency response, environmental protection, and other critical teams at ORNL. Interns will gain experience working with utility network data, editing and QA/QC workflows, and supporting map and dashboard production. Familiarity with Python scripting (e.g., ArcPy) is a plus. Applicants should be enrolled in a Geospatial Analysis degree or certificate program.

Fusion and Fission Energy Sciences Directorate (FFESD)

Nolan Goth (#40)

Nuclear Thermal Hydraulics

Nolan Goth is a research and development staff member specializing in nuclear thermal hydraulics. His work focuses on understanding how heat and fluids behave in nuclear systems, which is essential for designing safe and efficient reactors. He uses advanced modeling tools, simulations, and experimental data to study complex thermal-fluid and thermal-electric interactions. Nolan's research supports the development of next-generation nuclear reactors and radioisotope thermoelectric generators. He contributes to the U.S. Department of Energy's goals for clean energy and national security.

Marco Delchini (#46)

CFD analyst and developer

(1) CFD, fusion, fission, AI&ML, numerical methods, meshing, GPUs and CPUs.
(2) As a senior researcher I oversee the development of Vertex-CFD, a CFD solvers.
(3) C++ CFD solver built upon Trilinos (open-source package).
(4) Implement new modeling capabilities for DOE projects and NNSA projects.
(5) Interns will have the opportunity to learn about all capabilities involved in CFD solver and all steps for performing CFD analysis. Vertex-CFD involves a wide range of capabilities ranging from numerical method to ML&AI that can accommodate any research interests.

Gregory Davidson (#90)

Senior Research and Development Staff

My research interests include turbomachinery simulations, structural dynamics, rotordynamics, deterministic radiation transport algorithms, such as finite element Sn discretizations and time differencing methods, Monte Carlo charged particle radiation transport, multiphysics methods, computational fluid dynamics, software engineering, object-oriented programming, programming for massively-parallel systems, especially leadership-class computing, and programming for heterogeneous architectures, including GPUs.

My current focus is on using heterogeneous computer architectures for scientific computing, and on solid mechanics and structural dynamics simulations, using both low-order and finite element frameworks.

Information Technology Services Directorate (ITSD)

Sriram Chandrasekaran (#94)

Senior AI Architect

We use a variety of platforms (on-prem hardware and cloud resources) to develop applied AI solutions for ORNL Operations. Our range of work includes taking research outcomes and scaling them out to the lab, or, developing custom AI solutions for the lab by using SOTA industry capabilities.

Isotope Science & Engineering Directorate (ISED)

Clarice Phelps (#16)

Engineer

Research and development staff member with 20+ years of experience in the processing, recovery, and purification of transuranic and non-transuranic isotopes via solvent extraction techniques and/or IX or chromatography resins. Currently working on purification Pm-147 from an irradiated Nd-146 target at the High Flux Isotope Reactor.
U.S. Citizens only for current work.

Federico Gallo (#60)

Group Leader Dynamic Testing

We design and execute dynamic testing and characterization of mechanical structures, from componentry to full assemblies. We also study advanced dynamic systems including non-linear behavior components, novel damping mechanisms, and sub-structuring approaches.

Our expertise includes advanced measurement techniques, non contact telemetry, and high-speed photography. For the summer of 2026 we are interested in applying novel measurement techniques to characterize a non-linear structure and extrapolate simplified models of its behavior. The effort should lead to publishing the results and presenting it at the Society of Experimental Mechanics annual symposium and conference.

Kristian Myhre (#77)

Senior R&D Staff

I am focused on the science and technology underpinning production and utilization of radioisotopes for medical, energy, industrial, and security purposes. The primary focus of my research is on plutonium-238 production to support deep space exploration. I focus on utilizing radiochemical methods and analytical chemistry techniques to accomplish research goals while working with a large, interdisciplinary team.

Paul Benny (#91)

Sr. Scientist

My interests focus on understanding the science of nuclear and radiochemical separations. The main goals consist on translating fundamental science into the applications in security, environmental, and medical isotope production fields. In my research approach, experimental methods are explored and combined with computation approaches to provide a synergism to enhance scientific progress and predictively understanding.

National Security Sciences Directorate (NSSD)

Giri Iyer (#05)

Sr Program Leader

With over 30 years of experience in the energy and healthcare sectors, I have a proven track record of driving innovation and growth across diverse markets and technologies.

I leverage my Electrical Engineering background, Global MBA, Six Sigma training, and AI certifications to identify and execute disruptive M&A opportunities, product differentiation, and global ecosystem development, enabling utilities to enhance grid reliability, resiliency, and renewable energy integration. I have won four GE Innovation awards for creating and launching SaaS and big data offerings in energy and healthcare informatics, and generated over $2B of incremental revenues for Compaq/HP, GE Healthcare, GE Energy, and Koch Engineered Solutions. I am passionate about solving complex challenges and creating value for customers, partners, and stakeholders. https://www.linkedin.com/in/giriiyer/

Marc Fialkoff (#08)

Nuclear Security Research Staff

Marc Fialkoff is a nuclear security research staff member with the Transportation Security, Engineering, & Analysis group within the Nuclear Nonproliferation Division at Oak Ridge National Laboratory. Dr. Fialkoff supports countries in developing transport security regulations for nuclear and other radioactive materials. He serves as a subject matter expert for the International Atomic Energy Agency (IAEA) in the area of regulatory development and has served as a legal expert on missions to support Member States developing nuclear security regulations. In 2019, Dr. Fialkoff served as a consultant to the IAEA in their effort to support member states in developing regulatory infrastructure for transport security. His research also examines novel questions of nuclear security and maritime law. Currently, he is working on the intersection of nuclear and maritime security for transportable nuclear power plants and floating nuclear power plants. Interest in students in pre-law, marine affairs, political science, nuclear or civil engineering.

Sean Oesch (#19)

Senior Scientist in AI for Cybersecurity Research

My research focuses on applications of artificial intelligence to both traditional cybersecurity applications and cyberphysical systems. Using methods such as reinforcement learning, agentic artificial intelligence, and traditional

machine learning methods, my work solves cutting edge challenges in the cyber domain. Students who work with me typically gain experience in applied AI and have opportunities to present and publish their work.

Luke Koch (#37)

Counter-AI Researcher

I break stuff. More specifically, I specialize in identifying cyber vulnerabilities in AI systems. My experience is primarily in static binary instrumentation, file format manipulation, feature extraction evasion, and adversarial machine learning. My focus is on fixing vulnerabilities before they can be exploited in the wild. I've also worked on detecting malicious machine learning models. My work has been patented, commercialized, and won multiple awards from ORNL.

Bhartendu Pandey (#43)

Distinguished Staff Fellow

I am an urban scientist interested in understanding local-to-global urban changes and their human wellbeing and environmental sustainability implications, employing state-of-the-art in remote sensing, geospatial modeling, and complex systems sciences. My research examines infrastructure transition pathways addressing environmental challenges, with a machine learning and artificial intelligence focus to advance decision-making capabilities.

Monica Maceira (#72)

Seismology Portfolio Manager

I am a geophysicist at Oak Ridge National Laboratory who studies how vibrations in the ground and air—called seismo-acoustic signals—can be used to monitor industrial facilities from a distance. Much of my work focuses on detecting and understanding small vibrations produced by machines, explosions, or other industrial activities to support national security and nonproliferation efforts. I also work on energy-security problems such as geothermal exploration and carbon sequestration, where I use advanced mathematical tools—like inverse theory and joint inversion techniques—to create accurate 3D images of the subsurface. These methods help us understand where fluids or heat are moving underground and how the Earth responds to human activities. At ORNL, my research supports mission goals by improving remote monitoring technologies and developing better subsurface models for energy and national security applications. Overall, my work helps the Department of Energy enhance safety, efficiency, and scientific understanding across multiple programs.

Tristen Mullins (#76)

R&D Staff - Signal Processing Engineer

I am a researcher in the Cyber Resilience and Intelligence Division. My research focuses on hardware and embedded systems security, supply chain security, and side-channel analysis. Students that work on my projects play a key role in designing our research path to ensure we reach our goals and develop impactful deliverables, serve as task leads amongst their working group, and learn how to communicate their findings to leadership. I expect students to come out of an internship at ORNL with an idea of if research is a path they enjoy, a varied

network of researchers they can reach out to as their career develops, a collection of experiences they can reference during future interviews, as well as new and refined skills to help them excel in this field.

Marie Urban (#84)

Group Lead, Human Geography

Marie leads research at the intersection of AI, spatial demography, and geospatial analytics, driving spatiotemporal modeling frameworks that characterize populations and their movement across the globe, delivering critical insights for national security, humanitarian response, and global resilience. I specialize in delivering mission critical datasets and tools to US Federal and International mission partners for consequence assessment and to the open community for further research and technological advancements worldwide.

Clinton Stipek (#93)

R&D Associate - Geospatial Data Curator

My research pursues the ever-evolving built environment and the underlying patterns displayed by the most granular unit, buildings. At a high level, we leverage state-of-the-art feature engineering, machine and deep learning practices to gain further insight into how the built environment is changing, agnostic of application space. A major emphasis is on the attribution of the buildings themselves (age, height, use type) with other approaches being the structure of the electrical grid and its relation to the built environment.

Neutron Sciences Directorate (NScD)

Cheng Li (#22)

Neutron Scattering Scientist

I am an instrument scientist at the Spallation Neutron Source, where I use neutron scattering to investigate how advanced materials store gases, transport ions, and undergo atomic-scale structural changes. My work blends experimental design, large-scale data analysis, and the development of specialized tools that enable measurements under realistic operating conditions.

My professional focus includes:
- Studying the structure and dynamics in energy materials such as batteries and SOFC using neutron scattering
- Studying porous materials for separation and gas storage
- Developing advanced neutron scattering instrumentation and sample environments

Potential Summer 2026 student projects include:
- Simulation and analysis of stacking faults in energy materials and their signatures in diffraction patterns
- In situ synthesis and characterization of battery cathode materials
- Neutron scattering measurements of porous materials to understand adsorption and structural responses

Amith Hulikal Narayan (#25)

RF Engineer, (Accelerator Systems)

I am a LINAC Systems RF Engineer at Oak Ridge National Laboratory, working on high power RF systems for the H^- ion source at the Spallation Neutron Source. My focus is on designing, testing, and optimizing dual frequency 13 MHz and 27 MHz RF plasma ignition systems that improve reliability, lower the power needed for ignition, and reduce gas flow compared to the legacy 13 MHz setup.

I work across the entire RF chain: solid state power amplifiers, high voltage isolation transformers, low loss matching networks, and protective high pass filter chassis that safeguard the amplifiers under demanding operating conditions. A big part of my work is pushing these systems to operate efficiently and stably at high voltages around 70 kV, while maintaining good impedance match and very low insertion loss. In short, I build and refine RF systems that make plasma ignition more robust and production ready for next generation accelerator operation.

Dalton Lunga (#26)

Group Lead, Geo AI

I am an engineer and scientist pursuing the understanding of Earth observations using high performance machine learning/AI and remote sensing data. On the fundamental side, I work on architectural design for multimodal representation learning including on vision and language models to formulate backbones for self-supervised techniques. Our current applied projects include projects deploying AI/computer vision models on object detection, semantic segmentation, damage assessment to support disaster response efforts.

Justin Jacobs (#27)

Group Lead, Spatial Statistics

My research centers on spatiotemporal statistics, with emphasis on Bayesian and nonparametric approaches for inference from partial or uncertain data. I work on models for trajectories, distributions, and latent structure in high-dimensional spatial systems, including Gaussian processes, Dirichlet process mixtures, and stochastic differential equation-based formulations. My interests also include uncertainty quantification, geometric statistics, and scalable inference for large observational datasets.

Marie Urban (#28)

Group Lead, Human Geography

Marie leads research and innovation at the intersection of artificial intelligence, geospatial analytics, and demographic science, advancing modeling frameworks that characterize population distribution, dynamics, and behavior at global scale. She directs a team integrating machine learning, remote sensing, and large-scale computational methods to produce high-resolution, time-varying population data and actionable insights for U.S. federal agencies and international partners.

Luc L Dessieux (#50)

Computational Instrument Scientist (VULCAN Beam Line)

My current scientific interests lie in the field of materials science, crystallography, and computational modeling, specifically in developing advanced models of neutron scattering in real materials. These models are designed with tunable parameters to refine experimental data and yield quantitative insights from neutron scattering measurements. I focus on modeling both diffraction and transmission geometries using programming languages like C, Python, and MATLAB to create efficient and accurate simulations. This work aligns closely with ORNL's mission to deliver scientific discoveries and technological innovations that solve some of the world's most pressing challenges. By advancing neutron scattering models, my research supports ORNL's leadership in neutron science, particularly at cutting-edge facilities such as the Spallation Neutron Source (SNS) and High Flux Isotope Reactor (HFIR) enabling deeper understanding of material behavior at the atomic scale. Furthermore, these computational tools enhance the refinement of experimental data, contributing to ORNL's broader goals of accelerating materials discovery, advancing sustainable energy solutions, and leveraging high-performance computing to push the boundaries of scientific exploration.

Jeffrey Bunn (#61)

Instrument Scientist, Point of Contact for HIDRA Engineering Diffractometer

I specialize in neutron diffraction measurements of engineering materials, with a focus on understanding internal stresses, phase evolution, and microstructure in metals used in energy, aerospace, and manufacturing applications. As the lead scientist for the HIDRA beamline at HFIR, I design and support experiments that map stress inside complex components such as welded structures and additively manufactured parts. My work includes developing new robotic positioning systems and digital-twin simulations to make measurements faster, more automated, and more accurate. I also create data-analysis tools that help users interpret diffraction patterns and extract stress and strain information.

A Summer 2026 student may contribute to building digital-twin prototypes, refining Python-based analysis workflows, or investigating materials produced by 3D printing and advanced joining processes. Students with experience in coding, data analysis, mechanical design, or materials science will be strong fits, but enthusiasm and willingness to learn are the most important qualifications.

Lilin He (#64)

Staff Scientist

I am a beamline scientist at Oak Ridge National Laboratory, where I study the structure and behavior of advanced materials using small-angle neutron scattering (SANS). My work focuses on solving scientific and engineering challenges related to polymers and soft matters, porous materials, and also helping researchers understand how these materials behave at the meso- and nano- scales. I oversee experiment planning and beamline operations, ensuring that visiting scientists collect high-quality data using state-of-the-art SANS beamline. I am interested in developing analytical tools, computational models, and experimental techniques that strengthen ORNL's mission to advance energy materials and support the broader goals of the U.S. Department of Energy.

A student may assist in developing automated data-analysis pipelines for SANS experiments, including processing real neutron scattering data, building visualization tools, and testing machine-learning approaches for structural interpretation. Also help develop multimodal characterization tools on the beamline.

James Torres (#65)

Neutron Imaging Scientist

I am an instrument scientist on the MARS neutron imaging beamline at the High-Flux Isotope Reactor where we specialize in high-resolution neutron radiography and tomography. We apply these techniques to a wide range of materials, ranging from fossils, plants, and moon rocks to batteries, fuel cells, and structural components made from advanced manufacturing. My primary responsibilities are to ensure safe and reliable operations of MARS as well as develop world-class capabilities for the international community of users. There are several improvement projects and ideas to deliver these capabilities, including a) integrating hardware and software for quantitative imaging and scattering corrections; b) programming and commissioning a collaborative robot (cobot) system for automated tomography and launch of a mail-in program; c) develop various sample environments like furnaces, cryostats, humidity chambers, and pressure cells suitable for neutron imaging; and d) applying machine-learning and artificial intelligence tools for efficient data collection, reduction, and analysis.

Hassina Z. Bilheux (#66)

Distinguished Senior Neutron Imaging Scientist

My focus is the development of advanced neutron imaging (radiography, tomography, hyperspectral such as Bragg edge and resonance imaging) techniques at the Spallation Neutron Source. I'm particularly interested in applying these techniques to the fields of materials science such as advanced manufacturing, energy storage, nuclear materials, plant physiology and forensic science. Preferred qualifications: python programming intermediate to advanced skills.

Christopher Ridley (#78)

Instrument Scientist (High Pressure)

I am a high-pressure physicist specializing in neutron crystallography. My work uses extreme pressure as a controlled perturbation to reveal how materials, particularly those rich in light elements, respond at the atomic scale. By running a user program, I enable scientists from around the world to carry out unique neutron-based structural measurements that advance our understanding of fundamental physical properties.

Kazimierz Gofron (#81)

Sr. Software Scientist

This project focuses on implementing and enhancing EPICS controls for neutron beamlines, with particular emphasis on HKL reciprocal-space momentum calculations. These calculations are essential for instruments such as Triple-Axis Spectrometers or single-crystal goniometers.

Neutron scattering is a powerful technique for investigating excitations and structural properties in materials. The

HKL momentum calculations used by Triple-Axis Spectrometers enable precise measurement of the scattering function at any point within the instrument's accessible energy and momentum space.

During the fellowship, the participant will learn the EPICS control system in depth and gain experience integrating momentum-space calculation software into a control environment. This work will support improved instrument performance and user capabilities for neutron scattering experiments.

Among my other interests, are beamline controls of large user facilities (Synchrotron, neutron, ..). That includes detectors, motion, cameras (including Computer Vision), Artificial Intelligence (AI), and Machine Learning (ML).

Abdurahim Oguz (#86)

Laser & Optical Physicist

Dr. Oguz is conducting laser and optical technology development efforts for several key R&D projects that include laser assisted charge exchange injection, Spallation Neutron Source stripper foil temperature measurements, novel optical beam diagnostic methods for ring injection dump and target imaging system for Second Target Station etc. He is looking for a summer intern who specializes in programming languages such as Python, Matlab and Labview to develop a software platform for complex thermal imaging diagnostics for particle accelerators.
Learning Objectives • Acquire a foundational understanding of data acquisition and processing in particle accelerator diagnostics using various programming tools. • Enhance critical thinking abilities to assess and interpret experimental outcomes, recognize limitations, and propose viable solutions. • Learn to effectively convey scientific results through well-structured written reports and engaging presentations.
A prospective student must have taken general physics and math courses and desired to have good programming skills mentioned above.

Neutron Upgrades Project Office

Shuo Qian (#53)

Neutron Scattering Scientist

I develop neutron scattering instruments, sample environments, and data-analysis tools to study soft matter, biomembranes, polymers, and materials important to energy and the environment. Particularly I am interested in study biomolecules such as lipids interaction with polymers or other molecules. Also I am developing relative humidity control environment for neutron instruments that are serving a broad user community.
I am seeking a student with either biology background (for studying biomembranes) or physics/engineering background (for developing sample environment).

Physical Sciences Directorate (PSD)

Ilia Ivanov (#02)

Distinguished R&D scientist

Problems I work on: Integration of AI/ML in workflow of material multimodal characterization for predictive modeling of thin film functional/structural response to environment.

Primary objective: integration of AI agents, LLMs, digital twins in experimental workflow.

Tools/systems/technologies used: multimodal characterization of material assembly and behavior using optical, electrical, gravimetric, viscoelastic measurements on macro-micron scales. learn how materials assemble- how they respond to environment, correlate structure with functionality.

Impact of my work on ORNL & DOE: Interdisciplinary research to advance nanoscience and develop better understanding of interfacial processes. Students with basic and advanced coding skills for integration of diagnostics with a synthesis of the materials in the flow reactor.

Benjamin T. Manard (#03)

Senior R&D Staff Scientist

Our research focuses on inorganic-mass spectrometry (specifically inductively coupled plasma - mass spectrometry). We will tackle challenging problems, via ICP-MS, in applications spaces ranging from geochemistry, biochemistry, and environmental chemistry. Student must have taken analytical chemistry, or geo analytical chemistry, at minimum; with preferred instrumental analysis.

Chang Liu (#09)

R&D Associate Staff

In this project, we are investigating the structure-property relationship of well-defined catalytic sites in electrocatalysis. This project involved catalytic sites construction from colloidal synthesis, electrochemical characterization of catalyst, and material characterization. To validate the knowledge from bench, we will also study the catalyst performance from electrochemical device, such as water electrolyzer or fuel cells.

C. Patrick Collier (#11)

Senior research scientist

Pat Collier is a member of the Senior Research Staff at the Center for Nanophase Materials Sciences (CNMS) at Oak Ridge National Laboratory. The CNMS is one of five Nanoscale Science and Research Centers (NSRC) administered by the U.S. Department of Energy. He received his B.A. in Chemistry (with honors) from Oberlin College and his Ph.D. in Physical Chemistry at the University of California, Berkeley, where his thesis was on the design and characterization of reversible metal-insulator transitions in silver quantum dot monolayers. This was followed by a joint postdoctoral research appointment with the University of California, Los Angeles, and Hewlett-Packard Labs on molecular electronics. His current research interests center on the development of biologically derived soft materials for neuromorphic devices.

The title for the project is "Memory and Learning in Soft Materials". For this project, you will be constructing synthetic synapses, neurons, and axons for brain-like neuromorphic computing (i.e., neural networks) that feature the compositions, structures, and switching mechanisms found in actual biological membranes. These neuromorphic circuits can emulate key brain-like computing behaviors such as synaptic plasticity, enabling learning and computing tasks. Learning objectives include (1) operation of state-of-the-art nanofabrication tools at

the Nanofabrication Research Laboratory at ORNL, including thin-film deposition, lithography, etching, as well as microscale 3D printing. (2) handling soft, molecular materials such as phospholipid or polymer bilayers with embedded transmembrane biomolecules like ion channels and integrating these with the micro and nanofabricated structures produced in the NRL to configure hybrid bioelectronic circuitry. (3) characterizing the neuromorphic circuitry fabricated in the NRL and collaborating with other members of the group to support project deliverables.

Liangbo Liang (#15)

Senior R&D Staff

My research generally lies in condensed matter theory and computational physics, focusing on developing and applying large-scale theoretical/computational methods on supercomputers to understand and engineer diverse materials from first principles. Methods including DFT and many-body GW approach are used to study electronic, magnetic, optical, vibrational, and Raman scattering properties of quantum materials and nanomaterials such as graphene, hexagonal boron nitride, transition metal dichalcogenides, metal halides, altermagnets, etc. In particular, I am developing and deploying a highly scalable DFT and TDDFT code (RMG) to understand non-equilibrium charge (exciton) and spin dynamics of large-size systems, as well as non-equilibrium transport properties. I have been working on integration of accurate theoretical/computational approaches with various experimental techniques for the understanding of diverse materials, including modeling of scanning tunneling microscopy/spectroscopy (STM/S), Raman scattering, photoluminescence spectroscopy. I am looking for students who want to computationally simulate phonons (lattice vibrations) and magnons (spin excitations) in 2D materials.

Radu Custelcean (#18)

Distinguished Scientist

Dr. Custelcean's research interests are in the areas of self-assembled molecules and materials for environmental and energy applications, separation science and technology, supramolecular chemistry, and crystal engineering. Over the past 7 years, Dr. Custelcean has been involved in basic and applied research directed toward atmospheric CO2 capture, aka direct air capture (DAC) using aqueous organic bases such as amino acids or guanidines, and employing principles of physical organic chemistry and crystal engineering. His ultimate goal is to develop energy-efficient, cost-effective DAC technologies that will help address climate change.

P. Ganesh (#29)

Distinguished R&D Staff Member and Section Head of the Theory & Computation Section

Dr. Panchapakesan Ganesh is a Distinguished Research and Development Staff Member at Oak Ridge National Laboratory. His research interests lie at the intersection of theoretical condensed matter physics, theoretical quantum chemistry, computational material science, high-performance computing and machine-learning. Broadly, his research involves developing methods to gain fundamental insights into the role of defects and disorder in energy materials, electronic materials, correlated- and topological quantum-materials as well as designing new improved materials using these insights for various applications, combining high-performance computing with machine-learning & artificial intelligence based methods. A complete list of publications is available in his Google Scholar page.

Currently he leads the Theory and Computation Section at the Center for Nanophase Materials Sciences Division at Oak Ridge National Laboratory. Under his leadership the section is focusing on developing new theoretical methods leveraging HPC platforms for fundamental understanding of nanoscale materials and processes and developing novel methods for incorporating theory-in-the-loop of Autonomous Experiments using advanced AI/ML methods for accelerated discovery of foundational scientific knowledge and new advanced materials. Ganesh is also a thrust lead in the Center for Predictive Simulation of Functional Materials (CPSFM), a DOE Computational Material Science Center to develop and apply Quantum Monte Carlo methods for correlated solids.

Yanli Wang (#31)

senior R&D staff

Mechanical properties, high temperature materials.

Stephen Jesse (#38)

Section Head of Nanomaterials Characterization

Advanced electron and scanning probe microscopies for studying and manipulating matter at nano- and atomic scales. Novel control schemes and technique development for microscopy and data acquisition and analysis.

Santa Jansone Popova (#47)

Senior Research Scientist/Project Lead/CMI FA Lead/Mentor

I am a Senior R&D staff scientist in the Chemical Separations Group at ORNL, where I work on designing and demonstrating new molecular and materials-based separation systems for critical materials (especially rare earth elements), nuclear fuel cycle applications, and radioisotopes. My primary responsibilities include leading multi-institutional R&D projects, developing and translating novel organic ligands and separation processes from bench-scale experiments toward flowsheet demonstrations, mentoring students and postdocs, and coordinating closely with DOE programs and industrial partners to ensure our work aligns with national needs. My team and I use a combination of organic synthesis, solvent extraction, chromatography-based separations, hydrometallurgical process development, and advanced analytical techniques (ICP-OES/MS, etc.) alongside close collaboration with computational modeling groups.

For Summer 2026, a prospective student could contribute to a project focused on developing and testing new ligand systems for selective rare-earth separations. Preferred qualifications include completion of at least one year of university-level chemistry (ideally including Organic Chemistry and a laboratory course), strong interest in inorganic/physical/analytical chemistry or chemical engineering, and a demonstrated commitment to careful laboratory work and data-driven problem solving.

Vassiliki-Alexandra Glezakou (#49)

Distinguished Staff and Section Head of Chemical Transformations

Computational Scientist, quantum chemical methods, statistical mechanics, global optimization, machine learning. Provide solutions to energy-relevant problems in the areas of catalysis, separations, materials design and discovery.

Miaofang Chi (#54)

Corporate Fellow

Electron microscopy for energy and quantum materials, AI/ML for microscopy - we look for students who are interested in working with data scientists at ORNL to develop AI/ML methods for microscopy data acquisition, reduction and analysis.

Jingsong Huang (#58)

Research Scientist

My work focuses on using theoretical and computational tools to understand how the atomic-level structure of materials influences their physical and chemical properties. I study functional materials that are relevant to clean energy technologies, such as batteries, catalysts, and materials that convert or store electrical energy. To do this, I use advanced simulation methods, including density functional theory, many-body quantum approaches, and machine-learning–accelerated modeling, to interpret experimental observations and predict new materials and material behaviors. A central goal of my research is to bridge experiments and theory so that we can guide the development of improved materials for DOE missions in energy conversion and storage.

Eva Zarkadoula (#74)

Group leader - Senior R&D Staff Computational modeling

I use atomistic modeling and large-scale computer simulations to understand how atoms move and rearrange in materials exposed to extreme conditions such as radiation, heat, or stress. By combining molecular dynamics with machine-learning-based models, my work uncovers the atomic-level mechanisms that control material performance. I collaborate closely with experimental colleagues to connect simulation insights with real-world measurements. This research supports DOE missions by improving our fundamental understanding of materials and enabling the design of more robust systems for advanced technologies. A possible Summer 2026 project would involve building workflows to run and analyze molecular dynamics simulations to study how defects form and evolve in 2D materials; students with introductory physics and some programming experience would be a good fit.

Soumya Nag (#87)

Section Head - Materials and Processing

Material Science, Additive Manufacturing, structural materials, High temp materials, Convergent Manufacturing, PMHIP, Casting and Forging, Functional Graded Materials

Brennan Hackett (#89)

Neutrino Scientist

My expertise is in experimental particle physics R&D, where I develop the technology needed for the most sensitive experiments in the world, such as the search for neutrinoless double-beta decay. My focus is on repurposing common polymers and transforming them into radiopure, scintillating structural elements for massive detectors. I solve complex problems by leveraging cutting-edge techniques like 3D printing and advanced material development to ensure our detectors can actively reject background radiation. My work directly enables fundamental scientific discovery, creating the technological foundation for key DOE projects like the LEGEND collaboration. A summer student would gain hands-on experience using advanced additive manufacturing (3D printing) to prototype and test new radiopure polymer composites, quantifying their scintillation performance and structural stability for the next generation of the LEGEND detector.

US ITER Project

David Rasmussen (#52)

Fusion Energy Researcher

Senior staff member on the US ITER project, committed to mentoring the next generation of fusion professionals. The US is a partner in the International ITER fusion tokamak project currently under design and construction in southern France. The other international partners are the European Union, Russian Federation, Japan, South Korea, India and China. ITER is the first tokamak fusion device designed to achieve a burning plasma. The technical challenges require a multinational and multidiscipline team approach. Interns are exposed to a broad set of fusion science, engineering and project management activities.