U.S. DEPARTMENT of ENERGY | Office of Science

DOE Office of Science User Facilities
User Statistics Collection Practices, FY 2026

The documents that follow articulate the user statistics collection practices for the Office of Science User Facilities in the Fiscal Year 2026 reporting period. Each user facility or category of user facilities has a description with the following sections:

Steward: The Office of Science program that manages the facility—that provides funds and oversees the facility operations. The steward determines the practices for defining and counting users under the framework of the Office of Science policy memorandum, "Defining and Counting Users for the Office of Science User Facilities" issued August 23, 2013. More information regarding each program can be found at http://science.osti.gov.

Capabilities provided to users: A summary description that provides context for the typical ways that users interface with the facility. The description includes:

- at the highest level, the science that the facility enables,
- the defining physical characteristics of the facility that inform how individuals utilize the facility,
- the mode(s) in which it is utilized, including whether users work in series or in parallel, and
- a high-level statement regarding the differences between the types of users.

Methods of acquiring user statistics: Descriptions that articulate how the facility counts the three categories of user: On-Site, Remote, and Data. In some instances, a statement is included that describes the logistical criteria by which the facility counts users (e.g., through execution of a user agreement and completion of safety training). These descriptions are intended to promote transparency and efficacy in the Office of Science's user statistics collection practices and to foster awareness of the diversity of user interactions supported by the user facilities.

DOE Office of Science
Germantown, Maryland
October 2025

Facility: Energy Sciences Network (ESnet)
Steward: Advanced Scientific Computing Research

Capabilities provided to users:

The Energy Sciences Network (ESnet) is the Department of Energy's high-performance network, engineered and optimized for large-scale science. ESnet interconnects the entire national laboratory complex, including its supercomputer centers and all user facilities – enabling tens of thousands of scientists to transfer data, access remote resources, collaborate productively, and access the commercial Internet.

Massive science data flows require different network capabilities than network traffic generated by email, video, and web browsing. For this reason, ESnet does not resemble a commercial provider of Internet services. The facility's special capabilities include virtually lossless data transport, bandwidth guarantees spanning multiple network domains, and a distributed performance-monitoring platform. As the fastest science network in the world, ESnet aims to accelerate discovery by delivering unparalleled network infrastructure, capabilities, and tools, tailored to the needs of large-scale science collaboration. Network traffic on ESnet is growing at twice the rate of the commercial Internet.

ESnet's peering connections to the global Internet are resilient, redundant, and decentralized. ESnet staff monitor connectivity on a 24/7 basis, and in case of problems they work with DOE sites, commercial providers, and other research networks for resolution. The network's multiple 100 Gbps ring topology ensures that no single backbone circuit failure will cause an outage to a site.

The ESnet HPN user facility also operates a continental-scale network research testbed for the purpose of conducting research in a range of high-performance networking topics. Recent research projects have included software defined networking architecture, post-TCP protocol dynamics, and identification and improved performance of high-throughput science data flows.

Methods of acquiring user statistics:

User statistics are tabulated for the network research testbed and for access to guaranteed bandwidth services only; other users of the network (the vast majority) are not counted in ESnet user statistics.

- **On-Site Users:** An individual who has been granted authority for physical access to testbed resources to conduct research and development on the ESnet network testbed.

  The facility shall count each user who has completed registration, training, and safety requirements.

- **Remote Users:** An individual who has been granted authority to conduct research and development on the ESnet network testbed, or to transmit data using guaranteed bandwidth services.

  The facility shall count each user who has completed registration, training, and safety requirements.

- **Data Users:** N/A

Category: Leadership Computing Facilities (LCFs)
Steward: Advanced Scientific Computing Research
Facilities:

- **Argonne Leadership Computing Facility (ALCF)**
- **Oak Ridge Leadership Computing Facility (OLCF)**

Capabilities provided to users:

The Leadership Computing Facilities provide the most powerful computing resources in the U.S. for unclassified scientific research that spans topics relevant to national and energy security and broadly advances the frontiers of knowledge in physical sciences and areas of biological, environmental, and computer sciences.

The resources of the LCF facilities are available year-round on a 24 by 7 basis except during maintenance periods. In order to maximize the mission impact of the LCF systems, SC mandates that a large portion of the computing resources be devoted to large, leadership-class jobs, currently defined as jobs requiring over 20 percent of the computational resources. Researchers receive access to the LCFs primarily through successful peer reviewed proposals submitted to either the Innovative and Novel Impact on Theory and Experiment (INCITE) (https://science.osti.gov/ascr/Facilities/Accessing-ASCR-Facilities/INCITE) or the ASCR Leadership Computing Challenge (https://science.osti.gov/ascr/Facilities/Accessing-ASCR-Facilities/ALCC).

In addition to the leadership computers themselves, both LCFs provide access to high performance storage and archival systems for the data generated, specialized data analysis and visualization systems, and expertise in how to make the most effective use of all parts of the facilities. The LCFs employ a multi-faceted approach to address the needs of their users ranging from basic support in accessing the computing resources to complex support for algorithm development and performance improvement. Specifically, some projects are assigned a computational scientist to assist in scaling and improving application performance in the relevant science area. The facilities are linked with each other and their users via ESnet and other national and international research networks.

Methods of acquiring user statistics:

- **On-site Users:** N/A. All users access the LCFs through remote logins.

- **Remote Users:** An individual who has been granted authority to conduct research and development at an LCF under an approved proposal and user agreement.

  The facility shall count each user who has an active account covered under a valid user agreement.

- **Data Users:** An individual who has been granted authority to store and analyze their data at an LCF under an approved proposal and user agreement.

  The facility shall count each user who has an active account covered under a valid user agreement.

Facility: National Energy Research Scientific Computing Center (NERSC)
Steward: Advanced Scientific Computing Research

Capabilities provided to users:

The National Energy Research Scientific Computing Center (NERSC) is the dedicated scientific computing facility for the Office of Science research community. As one of the largest facilities in the world devoted to providing computational resources and expertise for basic scientific research, NERSC is a world leader in accelerating scientific discovery through computation. NERSC's mission is to accelerate the pace of scientific discovery by providing high-end, high-performance computing, information, data, and communications services for SC-sponsored research activities.

NERSC provides large-scale, state-of-the-art computing for researchers supported by DOE'S open scientific research programs spanning a wide range of disciplines and topical areas related to the DOE mission. In order to maximize scientific productivity, NERSC offers scientists integrated resources and services, such as one-on-one consulting services and in-depth collaboration as needed, which empower them to be more effective researchers. Many of NERSC's project consultants are themselves domain scientists in areas such as material sciences, physics, chemistry, and astronomy, well-equipped to help researchers apply computational resources to specialized science problems.

Resources at NERSC (www.nersc.gov/systems) are available year-round on a 24 by 7 basis except during maintenance periods. Because NERSC is SC's mission computing facility, DOE program managers across SC allocate most of the center's computing resources.

Methods of acquiring user statistics:

- **On-Site Users:** N/A. All users access NERSC through remote logins.
- **Remote Users:** An individual who is a member of an approved research project who has been authorized to use the facility and who has accepted the NERSC Appropriate Use Policies.

  The facility shall count each user who has an active account covered under a valid user agreement.
- **Data Users:** N/A

Facility: Atmospheric Radiation Measurement (ARM) User Facility
Steward: Biological and Environmental Research

Capabilities provided to users:

DOE seeks to inform energy decisions by providing scientific knowledge and tools to understand the impacts of atmospheric processes and phenomena on energy production, transmission, and use and to improve the ability of Earth system models to inform planning for future energy systems. In support of this objective the Atmospheric Radiation Measurement (ARM) User Facility is an integrated composite of highly instrumented research sites located in climatically important geographical regions of the earth. In-situ and remotely sensed measurements and associated data products are designed to improve the representation, in Earth system models, of clouds and aerosols, precipitation, extreme weather events and their interactions and coupling with the Earth's surface. This scientific infrastructure includes fixed research sites in three different meteorological regimes, three mobile facilities, an aerial facility, and a data center; all are available for use by scientists worldwide as a scientific user facility. The three fixed ARM sites are situated in geographically distinct locations to sample continental and marine conditions in different environments (US Southern Great Plains; North Slope of Alaska; and the Eastern North Atlantic). ARM also has an aerial measurement capability and three mobile facilities that can be used in experiments across the globe. Two of the mobile facilities are deployed on a proposal-driven basis for 6–24 month durations, while the third mobile facility conducts extended multi-year deployments. Scanning and vertically pointing radars provide a unique capability for high resolution delineation of cloud dynamical evolution, morphology, and radiative properties in support of both the atmospheric sciences and Earth system modeling. The simultaneous and parallel operation of multiple radar and lidar systems, capturing continuous data streams, provides an unparalleled capability for "interrogating" the three-dimensional temporal evolution of individual clouds and their interactions with the larger associated weather systems. Additional measurements include surface and near-surface observations of turbulent heat fluxes, , aerosol, , precipitation, meteorological parameters, soil moisture, and soil temperature. ARM's newest capabilities include a high-resolution modeling component that ties together observational data and large-eddy simulation modeling to support the study of atmospheric processes, high performance computing resources that enable users to more easily work with large volumes of ARM data, and an improved data discovery interface for users to easily find relevant data.

Methods of acquiring user statistics:

- **On-Site Users:** An individual who is physically present at the facility at least once during the reporting period to conduct an approved research project. Access is requested via the web-based Site Access Request form. The facility shall count each user who has completed registration and appropriate training.

- **Remote Users:** An individual who has been granted authority to participate remotely in experimental planning, execution, and data analysis of an approved research project through an approved ARM Field Campaign (AFC) request. Or an individual who remotely accesses the facility at least once during the reporting period, including to modify the operation of baseline instruments and/or investigator owned instruments, or to engage in remote use of the ARM computing resources. The facility shall count each user based on approved AFC, Site Access Request, or Computing Resources web forms.

- **Data Users:** An individual who remotely downloads data from ARM Data Center for scientific

research and/or uses data extraction tools supported by the facility during the current reporting year. This includes ARM facility staff who are involved in the development of synthesis products, value-added products, instrument performance analysis, and uncertainty quantification. The facility shall count each user through the web-based data access/user registration form. This is the primary category of user.

Facility: Environmental Molecular Sciences Laboratory (EMSL)
Steward: Biological and Environmental Research

Capabilities provided to users:

To advance the DOE-BER mission of providing understanding of complex biological, Earth, and environmental systems to support energy, economic, and national security needs, EMSL provides the scientific user community with a broad range of premier instruments for research on molecular to mesoscale and nanosecond to days-long processes. In addition, EMSL provides a production advanced scientific research computing and data archive system and optimized computational codes for molecular to continuum-scale modeling and simulation. Individual users and user teams thereby have access to a problem-solving environment in which combinations of more than 150 scientific instruments and advanced computing and data resources can be accessed to obtain a mechanistic understanding of physical, chemical, and biological processes and interactions relevant to the BER mission space. EMSL is located at the Pacific Northwest National Laboratory.

Capabilities available in EMSL include more than a dozen types of scanning, transmission, and tunneling electron microscopes as well as cryo-EM, and fluorescence imaging capabilities; a variety of nuclear magnetic resonance (NMR) spectrometers; tomography systems; microfluidics and similar pore-scale fluidics systems; more than a dozen types of spectroscopy systems; two dozen types of mass spectrometry systems; cell growth, isolation/sorting and characterization capabilities; instrumented plant growth chambers; TerraForms-reduced complexity soil-microbiome-plant micromodels; subsurface and rhizosphere 3-D imaging; several mass spectrometry imaging systems; isotope probing capabilities; interfacial surface characterization tools; a custom burn chamber for SOA generation; ice nucleation and aerosol chambers; a 0.95 petaflop GPU/CPU compute and 72Pb data archive system; and open source software codes optimized for environmental- and molecular-level modeling and simulation.

Scientists use EMSL's capabilities to study inorganic elements and the elemental complexes of Critical Materials and Minerals (CMM), as well as their transport and transformations; nutrient cycling in soils, sediments/rhizosphere, and groundwaters/surface waters; proteomics, metabolomics, structural dynamics, transcriptomics, and physiological states of a individual microbial cells, microbiomes, and plant cell types; intracellular metabolic processes in live bacteria, archaea, and fungal cells; intercellular communication and metabolic processes in microbial communities, fungi and plant roots; interactions with soils relevant to bioenergy and biofuels; the fate and transport of inorganic and organic compounds in soils, groundwater and the vadose zone; and biomolecular transformations using stable isotope probing.

In FY 2026, EMSL will initiate campaign-driven science for DOE-BER and the user community. These campaigns will focus on CMM; advances for the bioeconomy, including bioproducts; and the use of Artificial Intelligence/Machine Learning (AI/ML) and Large Language Models (LLMs) to accelerate autonomous science and scientific discovery. Campaigns will be hosted under of the three EMSL science areas: Computing, Analytics, and Modeling, Environmental Transformations and Interactions, and Functional Systems Biology. In addition to accepting general proposals and scientific partnerships to develop new capabilities, EMSL issues an annual call for Exploratory Research proposals which highlight new and emerging capabilities at EMSL, and FICUS (Facilities Integrating Collaborations for User Science) proposals which make use of capabilities at EMSL as well as at other user facilities such as the DOE Joint Genome Institute, the Atmospheric Radiation Measurements (ARM) user facility, the National Ecological Observation Network (NEON), the Center for Structural Molecular Biology (CSMB) at the Oak Ridge

National Laboratory, and the Advanced Photon Source (APS) at Argonne National Laboratory.

Some capabilities can be remotely operated/used from another institution or location (e.g., the computing system, NMRs, and the mass spectrometers) and run 24/7, but most of the instruments require staff support and are available 10h/day, five days a week. A few capabilities can be deployed outside the building in "field campaigns." Some users collaborate with EMSL staff via recently deployed analytical tools such as the Multi-omics Analysis Platform (MAP) and Core MS to showcase experimental results. Additionally, users develop new software, codes, and analyticalproducts that are made available to the scientific community. Remote data users have access to multiple types of experimental and theoretical data, thereby enabling data analytics research.

Methods of acquiring user statistics:

In all cases, a user is an individual who makes use of EMSL resources. Each user is categorized as one of the following:

- **On-Site User:** An individual who is a member of an approved research team, has signed all required user agreements, and is physically present using an EMSL capability, at least once during the reporting period, to conduct research on an active, peer-reviewed project.

- **Remote User:** An individual who is a member of an approved research team, has signed all required user agreements, and has been granted authority by the principal investigator to participate remotely in experimental/computational planning, execution (including remote operation of instrumentation/computing hardware or engaging with EMSL staff on sample submission/delivery), and data analysis on an active peer-reviewed project.

- **Data User:** An individual who registers for an EMSL NEXUS account and downloads data from EMSL's public data portal during the current reporting year, but did not participate in the collection, calibration, or reconstruction of those data.

An individual is counted as a user only once per fiscal year regardless of their number of active projects or data downloads. EMSL follows a hierarchical scheme for counting, in which an On-site User takes precedence over a Remote User. Data Users are counted once regardless of the number of data downloads and are counted separately from On-site and Remote Users. EMSL staff and Resource Owner projects are not included in user counts.

Facility: DOE Joint Genome Institute (DOE JGI)
Steward: Biological and Environmental Research

Capabilities provided to users:

The U.S. Department of Energy (DOE) Joint Genome Institute (JGI) is a federally-funded high- throughput AI-centric genome science user facility focused on supporting the DOE missions in energy and biotechnology through analyzing and harnessing genomic information from plants, fungi, algae, non-medical microbes, microbial communities, and other relevant organisms. The JGI provides access to large-scale datasets and analysis tools for genomes, metagenomes, and metabolomics through its data portals. To enable the generation and application of nascent, more facile AI models, the JGI is currently developing a new BER Data Lakehouse infrastructure that will integrate data generated by the JGI and other BER facilities and projects. The JGI provides collaborators around the world with access to massive-scale DNA and RNA sequencing for plant, algal, fungal, and microbial genomes and ecosystem metagenomes; microbial single cell genome sequencing; and other advanced sequencing capabilities. DNA synthesis, pathway and strain engineering, mass spectrometry-based metabolomics, Stable Isotope Probing (SIP), and advanced genomic technologies, are also offered by the JGI. These provide insight into the function of genes, enzymes, and metabolic pathways with biotechnology applications, such as generating fuel and other bioproducts, affecting plant biomass formation, degrading contaminants, and capturing and metabolizing critical minerals and materials (CMM) .

The JGI is situated in the Integrative Genomics Building (IGB) located on the campus of the Lawrence Berkeley National Laboratory. The JGI integrates the genomic capabilities of four partner institutions: Lawrence Berkeley National Laboratory (Berkeley Lab), Lawrence Livermore National Laboratory, the HudsonAlpha Institute for Biotechnology, and the Arizona Genomics Institute. The JGI provides genomic science capabilities in support of BER's missions in:

- Deep Understanding of Biological Function. Using JGI's spectrum of integrated capabilities for plants, fungi, algae, microbes, viruses, and communities of organisms, users can build understanding of how biology shapes metabolic processes such as ecosystem nutrient cycling, and how the interplay between biological, physical, geological and chemical processes and reactions sustains life on Earth.
- Predictive Engineering of Natural Biological Systems. Through building foundation knowledge of biological systems, making these data AI-ready, and the utilization of AI tools, the JGI is enabling its users to predict and program production systems for metabolic pathways and proteins for scalable biomanufacturing.
- Design of Novel Biological Systems Inspired by Nature. Projects focus on development plants that can be used as feedstocks for biofuel or biomaterial production, identifying organisms (e.g., fungi, and microbes) with enzymes and pathways that can break down the lignin and cellulose in plant cells walls, and characterizing enzymes and pathways that can ferment sugars into biofuels and other bioproducts. One new area of emphasis targets microbes and microbial communities (or metagenomes) that can capture, store and metabolize critical minerals.

Collaborators/users access JGI via several User Program routes:

- Proposal calls are periodically invited and then peer reviewed, and successful proposers allocated appropriate sequencing or other resources. Access for most users is through DOE JGI User Programs:
    - The Community Sequencing Program (CSP) including the annual CSP call, CSP New Investigator call and the CSP Functional Genomics call (https://jgi.doe.gov/user-

programs/program-info/csp-overview/)
- Facilities Integrating Collaborations for User Science (FICUS) a JGI-EMSL Collaborative Science Initiative (https://jgi.doe.gov/user-programs/program-info/ficus-overview/)

Additional JGI users are associated with the Bioenergy Research Centers (BRCs), the Biological and Environmental Research Support Science (BERSS) Program, as well as the Director's Science (DS) Program. BRC and BERSS research (https://jgi.doe.gov/work-with-use/proposals/special-programs) is reviewed by the BER and thus does not go through additional peer-review at the JGI.

The JGI plans to launch new calls for data collection, management, and analysis, including a potential FICUS call in FY27 with KBase, EMSL, and ASCR resources.

Methods of acquiring user statistics:

- **On-Site User:** An individual who is physically present at the facility to conduct work covered by a peer-reviewed proposal and who is issued an access badge; there are a small number of On- Site Users each year.

  The facility shall count each user who has completed registration, training, safety documentation, has a valid user agreement, and has a badge that facilitates tracking.

- **Remote User:** An individual who collaborates with JGI and is associated with one or more JGI User Program proposals. A Remote User for example sends nucleic acid samples for sequencing, or cell material for single-cell sorting, and/or metabolomics analysis to JGI. A remote user may also provide sequences for JGI DNA synthesis, or provide scientific support and insight otherwise, such as through data analysis and interpretation. Remote Users are under an active project covered by a JGI proposal, but do not visit the facility in person. Almost all DOE JGI users are considered Remote Users.

- **Data User:** DOE JGI currently has tens of thousands of external scientists who visit and utilize DOE JGI analysis and web-based data portals and download data from some of them. The JGI currently tracks portal users and records data that users download, and new processes are being developed to more accurately count and track data users.

Category: High Intensity X-Ray Light Sources
Steward: Basic Energy Sciences
Facilities:

- **Advanced Light Source (ALS)**
- **Advanced Photon Source (APS)**
- **Linac Coherent Light Source (LCLS)**
- **National Synchrotron Light Source - II (NSLS-II)**
- **Stanford Synchrotron Radiation Lightsource (SSRL)**

Capabilities provided to users:

These facilities provide pulsed beams of x-ray photons with high flux, brightness, and coherence, far more powerful than table-top light sources, for the exploration of matter and physical processes. The wavelengths of the emitted photon span a range of dimensions from the atom to biological cells, thereby providing incisive probes for advanced research in a wide range of areas, including materials science, physical and chemical sciences, metrology, geosciences, environmental sciences, biosciences, medical sciences, and pharmaceutical sciences.

Four of the experimental facilities are comprised of a centralized cyclic electron accelerator ring that generates the beams of light. Many beam lines and experimental end stations are arranged at tangents to the particle ring to capture the synchrotron light and utilize the facility simultaneously and independently. For the LCLS, a hard X-ray Free Electron Laser (XFEL), the x-rays are generated by a linear accelerator instead of a storage ring, so use of different beam lines is alternate rather than simultaneous. Light source beam lines and end stations support a wide range of experimental instruments for research in many scientific disciplines using a variety of beam line techniques that correspond to three broad categories: spectroscopy, scattering, and imaging. By exploiting the short pulse lengths of the LCLS, each technique can also be performed in a strobe-like fashion to probe reaction dynamics. These facilities generally operate 24 hours a day with scheduled periods for maintenance and machine studies.

Proposals are typically discrete from other work at the facility, with one principal investigator or a group of researchers proposing a specific project that utilizes a distinct amount of beam time on a particular beam line. Most users directly utilize the facility on-site, working with a host facility scientist to set up their experiment at a particular beam line or end station, with a growing number of remote users who virtually join experiments, who are authorized to remotely conduct experiments through computer network access, or mail their samples to facility scientists for data measurements.

Methods of acquiring user statistics:

- **On-Site User:** An individual who is physically present at the facility to conduct research on an approved research proposal. This is the primary category of user.

  The facility shall count each user who has completed registration, obtained required permissions for on-site access, has a valid user agreement, and is listed on an approved experiment safety form.

- **Remote User:** An individual who remotely accessed the facility and participated in the experiment, conducted research, and/or produced data through computer access. This category

also includes users who remotely accessed the facility by shipping samples to facility scientists for data measurements, or by receiving custom-manufactured materials, tools, or devices from the facility scientists because the facility has unique or unusual capabilities for synthesis or fabrication.

Remote Users at the light sources must be counted in only one of these subcategories:

Remote Access User—a researcher who participated remotely during the experiment (e.g., conferencing with beamline/facility staff and/or with on-site user(s) by providing direction for the measurements), conducted measurements through remote control of instruments, and/or produced data through computer access (this excludes persons who only "reviewed" data generated by others). The facility shall count each user who has completed registration, obtained required permissions for remote access, has a valid user agreement, and is listed on an approved experiment safety form.

Mail-in User—a researcher who ships samples to facility staff for measurements related to an approved proposal. The mail-in experiments are limited in scope and time. The facility staff conduct the measurements without the engagement of the researcher. The facility shall count only one user per proposed experiment who has completed registration, obtained required permissions for mail-in access, has a valid user agreement, and is listed on an approved experiment safety form.

Note that users at a specific facility can be counted only once per fiscal year for the purposes of user statistics. For user research that involves a combination of on-site users and remote access users, both the on-site and the remote access users who participate in the experiment/research/computed data generation are counted.

- **Data Users:** N/A. An individual who reduces and/or analyzes data and who is neither an On- Site nor a Remote User is not counted as a Data User.

Category: High-Flux Neutron Scattering Facilities
Steward: Basic Energy Sciences
Facilities:

- **High Flux Isotope Reactor (HFIR)**
- **Spallation Neutron Source (SNS)**

Capabilities provided to users:

These facilities provide beams of high-flux neutrons for the exploration of matter and physical processes. Neutron scattering provides important information on the positions, motions, and magnetic properties of solids. Neutrons possess unique properties such as sensitivity to light elements, which has made the technique invaluable to polymer, biological, and pharmaceutical sciences. Neutrons also have magnetic moments and are thus uniquely sensitive probes of magnetic interactions. Neutron scattering studies have contributed to the development of higher strength magnets for more efficient electric generators and motors and to better magnetic materials for magnetic recording tapes and computer hard drives. Finally, the high penetrating power of neutrons allows nondestructive property measurements deep within a specimen and has been used to study defects in automotive gears and brake discs and in airplane wings, engines, and turbine blades. In addition to wavelengths comparable to atomic lattice spacing, thermal neutrons also have energies that are comparable to elementary excitations such as phonons and magnons, and thus neutrons can be used to measure the energy and momentum transfer of these excitations via inelastic scattering.

Experimental facilities are comprised of a research reactor that produces continuous beams of neutrons (HFIR) and an accelerator facility that generates protons that impact a target and produce pulsed beams of neutrons in a process known as spallation (SNS). In both types of facilities, various types of specialized diffractometers and spectrometers are placed on beam tubes extending from the central core in the case of a reactor or from the spallation target at a pulsed neutron source. These facilities generally operate 24 hours a day with scheduled periods for maintenance and machine studies.

Scientific users or user groups obtain time on neutron instruments through a single proposal system that supports both facilities. The majority of users utilize the facility on-site, working with a host instrument scientist to set up their experiment at a particular beamline and in the analysis of the data, with a growing number of remote users who virtually join experiments. For some routine experiments, samples are "mailed-in" with the data collected by facility staff who send the results to the user for analysis.

Methods of acquiring user statistics:

- **On-Site User:** An individual who is physically present at the facility to conduct research on an approved research proposal. This is the primary category of users.

  The facility shall count each user who has completed registration, obtained required permissions for on-site access, has a valid user agreement, and is listed on an approved experiment safety form.

- **Remote User:** An individual who remotely accessed the facility and participated in the experiment, conducted research, and/or produced data through computer access. This category also includes users who remotely accessed the facility by shipping samples to facility scientists for data measurements, or by receiving custom-manufactured materials, tools, or devices from

the facility scientists because the facility has unique or unusual capabilities for synthesis or fabrication.

Remote Users at neutron scattering facilities must be counted in only one of these subcategories:

Remote Access User—a researcher who participated remotely during the experiment (e.g., conferencing with beamline/facility staff and/or with on-site user(s) by providing direction for the measurements), conducted measurements through remote control of instruments, and/or produced data through computer access (this excludes persons who only "reviewed" data generated by others). The facility shall count each user who has completed registration, obtained required permissions for remote access, has a valid user agreement, and is listed on an approved experiment safety form.

Mail-in User—a researcher who ships samples to facility staff for measurements related to an approved proposal. The mail-in experiments are limited in scope and time. The facility staff conduct the measurements without the engagement of the researcher. The facility shall count only one user per proposed experiment who has completed registration, obtained required permissions for mail-in access, has a valid user agreement, and is listed on an approved experiment safety form.

Note that users at a specific facility can be counted only once per fiscal year for the purposes of user statistics. For user research that involves a combination of on-site users and remote access users, both the on-site and the remote access users who participate in the experiment/research/computed data generation are counted.

- **Data Users:** N/A. An individual who reduces and/or analyzes data and who is neither an On- Site nor a Remote User is not counted as a Data User.

Category: Nanoscale Science Research Centers (NSRCs)
Steward: Basic Energy Sciences
Facilities:

- **Center for Functional Nanomaterials (CFN)**
- **Center for Integrated Nanotechnologies (CINT)**
- **Center for Nanophase Materials Sciences (CNMS)**
- **Center for Nanoscale Materials (CNM)**
- **The Molecular Foundry (TMF)**

Capabilities provided to users:

The Nanoscale Science Research Centers (NSRCs) are DOE's premier user facilities for interdisciplinary research to understand and control matter at the nanoscale, serving as the basis for a national program that encompasses new science, new tools, and new computing capabilities. NSRCs provide critical infrastructure to support the national nanoscience research effort in energy and other national priorities including quantum and microelectronics. Each center has particular expertise and capabilities in selected theme areas such as electronic and photonic nanomaterials synthesis, electron microscopy, quantum materials and structures, nanostructure characterization, catalysis, theory/modeling/simulation, soft and biological materials, imaging and spectroscopy, nanofabrication, and nanoscale integration.

The centers are housed in custom-designed laboratory buildings. Four of the five centers are co-located with other BES scientific user facilities for x-ray or neutron scattering, which complement and leverage the capabilities of the NSRCs. Each center contains clean rooms, nanofabrication resources, one-of-a-kind signature instruments, and other world-class instruments not generally available except at other major user facilities. NSRCs are knowledge-based facilities which, in addition to instrumentation capabilities, offer optional collaborative research with expert scientists in their fields. These facilities are made available on a scientific-merit basis to the broad research community.

User proposals are by one principal investigator or a small group of researchers proposing a specific project that utilizes a distinct amount of time on one or more instruments or capabilities. The majority of users directly utilize the facility on-site, working with a host instrument scientist to set up their experiment at particular instruments or collaborate with staff scientists. A growing number of remote users virtually join experiments or are authorized to remotely generate data through computer access to physical instrumentation. Some users are researchers who receive custom-fabricated or synthesized materials, tools, or devices based on the facilities' unique or unusual capabilities. Users can also access an extensive set of computation and simulation tools (e.g., first principles, machine learning, artificial intelligence, etc.) for theory and modeling projects.

Methods of acquiring user statistics:

- **On-Site User:** An individual who is physically present at the facility to conduct research on an approved research proposal. This is the primary category of users.

  The facility shall count each user who has completed registration, obtained required permissions for on-site access, has a valid user agreement, and is listed on an approved experiment safety form.

- **Remote User:** An individual who remotely accessed the facility and participated in the experiment, conducted research, and/or produced data through computer access. This category also includes users who remotely accessed the facility by shipping samples to facility scientists for data measurements, or by receiving custom-manufactured materials, tools, or devices from the facility scientists because the facility has unique or unusual capabilities for synthesis or fabrication.

  Remote Users at the NSRCs must be counted in only one of these subcategories:

  Remote Access User—a researcher who participated remotely during the experiment (e.g., conferencing with facility staff and/or with on-site user(s) by providing direction for the measurements), conducted measurements through remote control of instruments, and/or produced data through computer access (this excludes persons who only "reviewed" data generated by others). The facility shall count each user who has completed registration, obtained required permissions for remote access, has a valid user agreement, and is listed on an approved experiment safety form.

  Mail-in User—a researcher who ships samples to facility staff for measurements related to an approved proposal. The mail-in experiments are limited in scope and time. The facility staff conduct the measurements without the engagement of the researcher. The facility shall count only one user per proposed experiment who has completed registration, obtained required permissions for mail-in access, has a valid user agreement, and is listed on an approved experiment safety form.

  Off-Site User—a researcher to whom the facility provides custom-manufactured materials, tools, or devices that the facility has unique or unusual capabilities for synthesis or fabrication. The facility shall count only one user per proposed experiment who has completed registration, obtained required permissions for off-site access, has a valid user agreement, and is listed on an approved experiment safety form.

  Note that users at a specific facility can be counted only once per fiscal year for the purposes of user statistics. For user research that involves a combination of on-site users and remote access users, both the on-site and the remote access users who participate in the experiment/research/computed data generation are counted.

- **Data Users:** N/A. An individual who reduces and/or analyzes data and who is neither an On-Site nor a Remote User is not counted as a Data User.

Category: Magnetic Fusion Research Facilities
Steward: Fusion Energy Sciences
Facilities:

- **DIII-D Tokamak**
- **National Spherical Torus Experiment Upgrade (NSTX-U)**

Capabilities provided to users:

These facilities confine plasmas at temperatures and densities close to what is required for a fusion energy source. These facilities enable researchers to study the stability, confinement, and other properties of fusion-grade plasmas under a wide variety of conditions and to explore a subset of the materials science issues required to manage the intense heat and particle fluxes of a fusion power plant. The experimental results from these facilities combined with theoretical and computational simulations build the scientific foundation needed to develop a fusion energy source.

These experimental facilities are comprised of magnetic field coils that confine a plasma in a large toroidal vacuum chamber, auxiliary heating systems to heat the plasma to tens of millions of degrees Kelvin, field-shaping coil systems that can produce a variety of plasma shapes, advanced digital control systems for feedback control of the plasma, and extensive diagnostic instrumentation to measure the properties of high-temperature plasmas. These experiments normally operate 8 hours per day during an annual operating period of 10-18 weeks per year. There are normally several maintenance weeks during the run period and a long outage of several months' duration for major maintenance and facility upgrades at the end of each run period.

Experimental time on the facility is allocated on the basis of proposals submitted by teams. However, since most experimental proposals require extensive diagnostic measurements and specialized plasma control programming, a significant fraction of the host staff and collaborators are involved in most experimental proposals. It is important to note that since the creation and control of the plasma is a critical part of every experiment, many of the operations staff are therefore users. Some users participate in experiments from remote locations and/or are involved with planning and analysis of experiments from remote locations.

Methods of acquiring user statistics:

- **On-Site User:** An individual who is physically present at the facility and involved in planning, preparation, execution, and analysis of one or more approved experiments on the facility.

  Facility staff shall count each user through badge requests/visitor forms, data access/user agreements, office assignments and proposal co-authorship.

- **Remote Users:** An individual who has been granted authority to participate remotely in experimental planning, execution, and data analysis. The individual might visit the facility to attend specific meetings or present results but would not have access to the experimental facilities.

  Facility staff shall count each user through data access/user agreements and proposal co-authorship.

- **Data Users:** An individual who reduces and/or analyzes data provided by the facility but did not participate in the collection, calibration, or reconstruction of that data and who is neither an On-Site or Remote user.

  Facility staff shall count Data Users through data access/user agreements.

Facility: Accelerator Test Facility (ATF)
Steward: High Energy Physics

Capabilities provided to users:

The Accelerator Test Facility (ATF) at Brookhaven National Laboratory is a facility for R&D, primarily in the areas of accelerator and advanced accelerator physics. The facility delivers a high brightness electron beam synchronized with high power lasers, to multiple experimental beam lines. Electron beams and lasers are made available (subject to user readiness) in each of these experimental areas for 10 hours per day, Monday – Friday (not including public holidays) with scheduled maintenance and facility development periods.

Proposals for ATF experiments are reviewed at the annual ATF Program Advisory Committee Meeting (PAC), which coincides with the ATF Users' Meeting. The PAC assesses the merits of each proposal and its suitability for the ATF and passes its recommendations on to the ATF Director who awards approved experiment status where appropriate. Experimental time is allocated to user groups with approved experiments based on the experimental requirements and demand from other users. This allotment is determined quarterly by the Electron Beam and Laser Coordinators along with the Facility Director.

Methods of acquiring user statistics:

The ATF records each user arriving at the facility and also surveys the experiments using a census form collected annually. In addition, we have access to the user data collected by the BNL Guest, User and Visitor Center. Most of our users are On-Site Users (see below), but we also acquire statistics as listed below:

- **On-Site User:** An individual who is physically present at the facility at some point during the reporting period to conduct research on an approved experiment.

  The facility shall count each user who has completed registration, training, has a valid user agreement, and has a badge that facilitates tracking.

- **Remote User:** An individual who has been granted the authority to remotely participate in approved experiment operations/data collection from a remote location and who has utilized that authority at some point during the reporting period. If an individual qualifies as an On-Site User and as a Remote User, that individual should be counted once as an On-Site User.

- **Data Users:** An individual who reduces and/or analyzes data provided by the facility but did not participate in the collection, calibration, or reconstruction of that data and who is neither an On-Site nor a Remote user.

Facility: Facility for Advanced Accelerator Experimental Tests II (FACET-II)
Steward: High Energy Physics

Capabilities provided to users:

FACET-II is a National User Facility that provides the DOE with the unique capability to develop advanced acceleration and coherent radiation techniques with high-energy electron beams. FACET-II builds on the decades-long experience developed conducting advanced accelerator R&D at the Final Focus Test Beam (FFTB) and FACET. In addition to advanced accelerator science, FACET-II develops ultra-high brightness beams for Basic Energy Science and novel radiation sources for a wide variety of applications.

FACET-II uses a kilometer of conventional linear accelerator to deliver 10 GeV electrons to an experimental area where they interact with a 10 TW experimental laser and a variety of solid, gas and plasma targets. The design allows for adding the capability to produce and accelerate positrons later.

Proposals submitted to FACET-II are peer reviewed. Peer review is an essential element in ensuring that experimental facilities are utilized for the highest quality science and that the allocation of this scarce resource is fair and transparent. A written proposal is provided, and a presentation is given at a Program Advisory Committee meeting. The highest rated proposals are offered beam time based on availability and the scope of infrastructure changes required to support the experiment.

Methods of acquiring user statistics:

FACET-II surveys the experiments using a census form collected annually. In addition, we have access to the user data collected by SLAC's Visitor User Employee (VUE) center.

- **On-site users** have been registered at SLAC and have a SLAC identification badge in order to obtain unescorted access to the user facility. On-site users can include staff and students who participate in scheduled experiments, in preparing for experiments, manipulating beam line instrumentation, collecting, analyzing, or interpreting data. This includes SLAC staff.

- **Remote users** are individuals who have been granted the authority to remotely participate in approved experiment operations/data collection from a remote location and who have utilized that authority at some point during the reporting period. If an individual qualifies as an On-Site User and as a Remote User, that individual should be counted once as an On-Site User.

- **Data users** are individuals who reduces and/or analyzes data provided by the facility but did not participate in the collection, calibration, or reconstruction of that data and who are neither an On- Site or Remote user.

Facility: Fermilab Accelerator Complex
Steward: High Energy Physics

Capabilities provided to users:

Fermilab's Accelerator Complex comprises ten particle accelerators and storage rings that provide beams to a number of experiments. The Fermilab Accelerator Complex supports or has supported studies of the fundamental physics of the world around us at the energy frontier and the intensity frontier. Fermilab's accelerators operate 24 hours a day, 7 days a week, with scheduled periods for maintenance, machine studies, and upgrades.

Proton beams are available at 8 GeV from the Booster and at energies from 60 GeV to 120 GeV from the Main Injector. These beams can be used directly for experiments or can be used to produce other elementary particles like muons, pions, kaons, or neutrinos for experiments. Currently, the Neutrinos at the Main Injector (NuMI) facility is the world's most intense neutrino source.

Proposals for Fermilab experiments are generally submitted by a collaboration of several university and laboratory research groups; the collaboration may be composed of up to several hundred physicists and graduate students. All proposals for experiments at Fermilab are peer reviewed for their scientific merit by the Physics Advisory Committee composed of senior physicists from institutions around the world. Approval is determined by the Fermilab Director based on the outcome of the merit review and consideration of laboratory resources needed by the experiment.

Methods of acquiring user statistics:

- **On-Site User:** An individual who is physically present at the facility at some point during the reporting period to conduct research and/or development on an approved experiment. Facility scientific staff are counted as users if they participate in the research and/or development of an approved experiment.

  The facility shall count each user who has completed registration, training, safety documentation, has a valid user agreement, and has badge that facilitates tracking.

- **Remote User**: An individual who has been granted the authority to remotely monitor or control an approved experiment, participate in the development of an approved experiment, or process data from an approved experiment at the facility and who has utilized that authority at some point during the reporting period. If an individual qualifies as an On-Site User and as a Remote user, that individual should be counted as an On-Site user.

- **Data Users:** An individual who reduces and/or analyzes data provided by the facility but did not participate in the collection, calibration, or reconstruction of that data and who is neither an On-Site or Remote user.

Category: **Nuclear Physics Accelerator Facilities**
Steward: **Nuclear Physics**
Facilities:

- **Argonne Tandem Linac Accelerator System (ATLAS)**
- **Continuous Electron Beam Accelerator Facility (CEBAF)**
- **Facility for Rare Isotope Beams (FRIB)**
- **Relativistic Heavy Ion Collider (RHIC)**

Capabilities provided to users:

The Argonne Tandem Linac Accelerator System (ATLAS) at Argonne National Laboratory (ANL) is used to study questions of nuclear structure by providing high-quality beams of all the stable elements up to uranium and selected beams of short-lived nuclei for experimental studies of nuclear properties under extreme conditions and reactions of interest to nuclear astrophysics. The Continuous Electron Beam Accelerator Facility (CEBAF) at the Thomas Jefferson National Accelerator Facility (TJNAF) provides high quality beams of polarized electrons that allow scientists to extract information on the quark and gluon structure of protons, neutrons, and nuclei. CEBAF also uses polarized electrons to make precision measurements of parity violating processes that can provide stringent tests of the Standard Model. The Facility for Rare Isotope Beams (FRIB) at Michigan State University is used to advance understanding of the atomic nucleus and the evolution of the cosmos by providing beams of rare isotopes with neutron and proton numbers far from those of stable nuclei to test the limits of nuclear existence. These three facilities conduct fixed target experiments, meaning that a beam of particles is directed onto a target of material, and scientific instrumentation is utilized to study the products of the reaction between the target and the beam of particles. The Relativistic Heavy Ion Collider (RHIC) at Brookhaven National Laboratory (BNL) uses relativistic heavy ion collisions to investigate the frontier of Quantum Chromodynamics (QCD) by trying to recreate and characterize new and predicted forms of matter and other new phenomena that might occur in extremely hot, dense nuclear matter and which have not existed since the Big Bang. RHIC also provides colliding beams of spin-polarized protons to probe the spin structure of the proton, another important aspect of the QCD frontier. RHIC is the only operating collider in the United States.

ATLAS, CEBAF and RHIC are multi-user facilities, with the capability to conduct multiple experiments in parallel. Currently FRIB will service only one experiment at a time. The facilities have unique and cutting-edge instrumentation that are housed in experimental stations or halls. At ATLAS, CEBAF, and FRIB there are multiple beam lines that direct the beam to the different experimental stations; at RHIC, experimental equipment is located at various collision points along the collider rings. These facilities can operate 24 hours a day, seven days a week, with scheduled periods for maintenance and machine studies. Frequency of operations is typically constrained by available funding.

Experimental time on the facility is allocated on the basis of proposals submitted by collaborations of scientists usually represented by a principal investigator or spokesperson. Each proposal defines a specific project that utilizes a distinct amount of beam time on a particular beam line or beam collision point, and which typically requires complex scientific instrumentation. Facility directors seek advice from facility Program Advisory Committees in determining the allocation of their valuable scientific resources.

The facility Program Advisory Committees review research proposals requesting resources and time at the facilities and then provide advice on the scientific merit, technical feasibility, and personnel

requirements of the proposals. Most users directly utilize the facility on-site, working with a host instrument scientist to set up their experiment at a particular beam line or end station. Some users are authorized to remotely generate data through computer access to physical instrumentation. Other users play a key role in developing the instrumentation which is essential for the experiment to be conducted at the facility.

Methods of acquiring user statistics:

- **On-Site User:** An individual who is or has the intent to be physically present at the facility to conduct research on an approved research proposal during the reporting period. Facility staff are counted as users if they participate in an approved experiment.

  The facility shall count each user who has completed registration, training, safety documentation, has a valid user agreement, and has a badge that facilitates tracking. Intent to be physically present is captured by including the names of all scientists on the Physics Advisory Committee-approved proposal.

- **Remote User:** An individual who has been granted the authority to remotely produce data through computer access or who has developed equipment or software at their home institution that plays a role in the production of data during the experiment.

  The facility shall count each user who registers, completes all required training for remote access, has a valid user agreement, and submits an experiment safety form. Remote users can also include the scientists off-site who play a key role in the development of the complex instrumentation that is to be used in the conduct of the experiment at the facility.

- **Data User:** N/A. An individual who reduces and/or analyzes data and who is neither an On-Site nor a Remote User is not counted as a Data User