

SAND2001-2391P



Partnerships Home
Technology Access

[About Sandia](#)[Capabilities](#)[Programs](#)[Contacts](#)[News](#)[Search](#)[Sandia Home](#)

User Facilities List

Many of Sandia's unique research facilities are available for use by U.S. industry, universities, academia, other laboratories, state and local governments, and the scientific community in general. User Facilities are a unique set of scientific research capabilities and resources whose primary function is to satisfy Department of Energy (DOE) programmatic needs, while being accessible to outside users.

User Facilities consist of interrelated physical plants, equipment, instrumentation, scientific expertise, and necessary operational personnel.

For more information about Sandia User Facilities or for help in the selection of a user facility that will meet your needs, contact [Gary Jones](#) at (505) 844-3130, FAX (505) 284-3453.

User Facilities available to you:

[Advanced Battery Engineering Facility](#)

[Center for Security Systems](#)

[Combustion Research Facility](#)

[Component Modeling and Characterization Facility](#)

[Design, Evaluation and Test Technology Facility](#)

[Electronic Technologies User Facility](#)

[Electronics Quality/Reliability Center](#)

[Engineering Sciences Experimental Facilities \(ESEF\)*](#)

[Explosive Components Facility Geomechanics Laboratory](#)

[Intelligent Systems and Robotics Center](#)

[Ion Beam Materials Research Laboratory](#)

[Manufacturing Technologies Center](#)

[Materials and Process Diagnostics Facility](#)

[Mechanical Test and Evaluation Facility](#)

[National Solar Thermal Test Facility \(NSTTF\)](#)

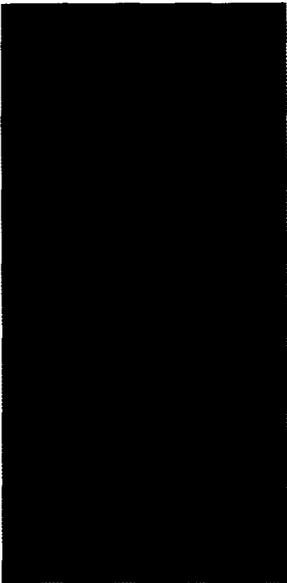
[NUFAC Nuclear Facilities Resource Center](#)

[Photovoltaic Laboratories](#)

[Plasma Materials Test Facility](#)

[Primary Standards Laboratory](#)

Done
2/2/01



Pulsed Power and Systems Validation Facility

Radiant Heat Facility

Radiation Detector Analysis Laboratory

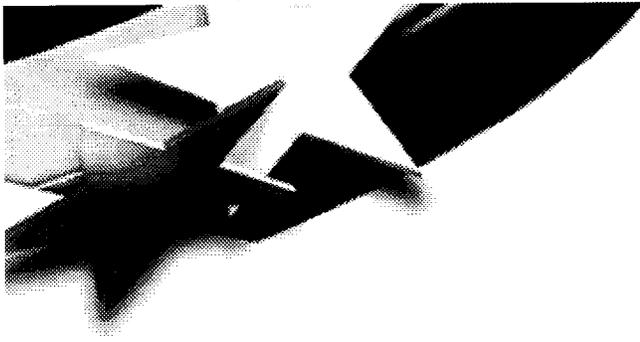
Sandia's Orpheus Site

Shock Technology and Applied Research Facility (STAR)

*Pending approval

For all other questions or comments, contact partnerships@sandia.gov, or call (505) 284-2001.

[Back to top](#) || [Questions and Comments](#) || [Acknowledgment and Disclaimer](#)



Advanced Battery Engineering Facility

The Advanced Batteries Research, Engineering, and Evaluation Facility (ABREE) at Sandia National Laboratories provides comprehensive capabilities in power source research, engineering characterization, evaluation, and testing. Supporting ABREE is a staff of over forty scientists, engineers, and technicians with backgrounds in chemistry, electrochemistry, metallurgy, chemical engineering, materials science and engineering, and physics.

State-of-the-art equipment and software are available to perform a wide variety of research activities for almost any primary or rechargeable technology. Facilities include two dry rooms, numerous wet chemical laboratories, several battery test laboratories, and computer database management equipment. Both a 3,000 sq. ft. dry room and a smaller dry room with a full-ventilation hood have the equipment to fabricate and assemble finished thermal batteries and lithium ambient temperature batteries from raw materials.

Nine business areas provide the focal points for ABREE activities:

- Power sources evaluation
- Thermal battery development and production
- Stockpile support for power sources
- Lithium ambient-temperature batteries
- Lithium ion rechargeable battery
- Electric vehicle batteries
- Fuel cell R&D
- Double-layer capacitors
- Energy storage systems program

Power Sources Evaluation

The Power Sources Evaluation capability provides a variety of critical services to a diverse customer base. Most of the programs within the Power Sources Technology Group rely on evaluation and testing activities to achieve their objectives. The capability includes projects for DOE

Defense Programs such as a tester design, development, fabrication, operation, calibration, and repair, as well as data archive support for weapon power source components. Significant programs are performed in support of the Electric Vehicle Battery and Energy Storage Systems business projects. Examples of other external test and evaluation activities include contract work with Phillips Lab (Air Force) for testing advanced batteries and with Wilson-Greatbatch, Ltd. for testing biomedical batteries.

Battery Testing Capabilities and Facilities

- Six battery testing laboratories
- Forty test stations for rechargeable battery testing
- Constant resistance, current or power, and profile testing
- Test unit size range from mAh, single cells to 240-V, 40kWh systems

Environmental Testing Capabilities and Facilities

- Fully-instrumented remote site for abuse testing
- Prototype evaluation capabilities
- Comprehensive vibration, mechanical shock, temperature shock, humidity, and acceleration test equipment
- Nondestructive, electromagnetic, and wind tunnel testing

Thermal Battery Development and Production

This focus area provides the capability to design, develop, and prototype thermal batteries. Activities include material development and characterization, advanced development, performance and thermal modeling, process development, analysis, fabrication of prototype designs, and evaluation. Critical facilities are a 3,000-square-foot dry room that houses processing equipment, presses, assembly stations and welders; and research labs to support material development. Critical staff include material, scientists, chemists, mechanical engineers, battery designers, and process and assembly technicians. This project supports the defense programs (DP) sector for stockpile improvements, new systems, failure analysis requirements, and shelf-life extensions. Our unique capabilities qualify Sandia to accept the most challenging DoD assignments.

The dry room can maintain a relative humidity under 3%. The equipment that is available includes:

- 50T, 150T, and 300T presses
- Blenders grinders, and fusion furnaces for powder processing
- TIG and laser welders
- Battery testers
- Material synthesis and characterization

Stockpile Support for Power Sources

This focus area provides DOE/Defense Programs stockpile support for thermal batteries, lithium ambient-temperature batteries, zinc/silver oxide batteries, nickel-cadmium batteries, radioisotopic thermoelectric generators (RTGs), and double-layer capacitors. We have a DOE mission assignment for the thermal, lithium ambient-temperature, and zinc/silver oxide batteries and for the double-layer capacitors that involves procuring and accepting weapons-related products to support the directive schedule. the RTG milliwatt heat source surveillance and the thermal-battery backup production projects are elements of the Reconfiguration Program. The Milliwatt Heat Source Project has been transferred from EG&G/Mound to Sandia and the thermal battery production project is underway. In addition to these specific projects, stockpile support responsibilities include dismantlement activities, field return evaluations, shelf-life surveillance, responses to reliability and surety issues, and project management.

Lithium Ambient-temperature Batteries

This focus are provides applied research and development of primary lithium batteries for weapon and space applications. Activities include cell design, modeling, fabrication, testing, and evaluation, battery pack engineering, and transferring the production technology to industry. Our customers include all current weapon programs that require a long life uninterrupted power source. Therefore our systems are closely linked to the security and reliability of the stockpile. DoD customers have periodically solicited our help for special applications. Technology transfer of our designs to commercial suppliers provided the opportunity for dual use of our technology. We are viewed as a leader in the field and our staff are recognized outside Sandia.

Lithium-ion Rechargeable Battery

This focus are provides an important link to the U.S. battery industry. Their interest in the technology is driven by foreign competition and the projections that lithium-ion batteries will dominate the future consumer rechargeable battery market. Our activities range from material synthesis and characterization to battery design for specific applications. The Battery Technology Initiative (BTI) Cooperative Research and Development Agreement (with its matching Defense Program funds) provides market pull and the DOE Office of Basic Energy Science (OBES) builds our technology base. This project enables us to contribute to the U.S. battery industry, as well as to apply this technology to future weapon monitoring applications. We propose to use our state-of-the-art research, development, and evaluation facilities to demonstrate new thin-film battery processing technology and/or microbattery-on-a-chip technology.

Electric Vehicle Batteries

This focus area involves battery research, design, development and technology support, for electric vehicle applications. There are currently two major customers for this project: the DOE Office of Transportation Technologies and the United States Advanced Battery Consortium (USABC). We have managed major development contracts, performed in-house research, and participated in leadership roles on the Electric Vehicle battery Readiness Working Group for DOE. We have had a three-year Cooperative Research and Development Agreement for approximately \$10M to perform research and development on electric vehicle batteries; primarily to conduct basic and applied research related to the sodium/sulfur technology, and give technical support for all USABC technologies via consultation; safety assessments; environment, safety, and health (ES&H) studies; and battery testing. We are working to transfer the technology developed during the USABC Cooperative Research and Development Agreement to private industry.

Fuel Cell Research and Development

We provide support to the fuel cell initiative led by the Advanced Energy Technology Center 6200. Direct methanol fuel cells (DMFCs) are foreseen as the technology of the future. DMFCs are attractive for military and commercial applications since methanol is inexpensive, widely available, and easily stored and distributed. It also possesses very high energy density (6 Wh/kg). Most of our work in direct methanol oxidation has been aimed at developing innovative methanol oxidation catalysts. Currently there is only one significant fuel cell project in the Power Sources Technology Group. Using laboratory-directed research and development (LDRD) funding, we have initiated development of alternative catalysts which are inexpensive, stable, and possess good catalytic activity for the direct oxidation of methanol in a proton exchange membrane fuel cell. We view this focus area as a growth area.

Double-layer Capacitors

Tailored, DOE-proprietary carbons processed into electrodes for "supercapacitors" have the potential to increase the volumetric capacitance of commercial capacitors by at least an order of magnitude. We have qualified a "supercapacitor" for use in weapons programs, and we are developing advanced material for the next generation of devices. Activities in this focus area are on tailoring the surface chemistry and morphology of Sandia-produced carbon to optimize its performance. Furthermore, we design and fabricate test cells and prototypes of these devices. Potential commercial applications range from power-assist applications for electric vehicles and keep-alive capacitors for weapons and commercial electronics to providing higher power pulses required for high speed digital communication.

Energy Storage Systems Program

The ESS Program is conducted for the DOE Office of utility Technologies within Sandia's Applied Energy Program of the Energy and Environment (EE) Sector and involves collaboration with numerous Sandia organizations. The mission of the ESS Program is to provide focused research and development that will enable battery storage to become an economically attractive resource option for utilities by the year 2000. The ESS Program consists of four interrelated elements: Systems Analysis, Component Research and Development, System Integration and Implementation Evaluation, and Information Exchange. We provide program planning, contract management, technical management, prototype evaluation, and applied research for the ESS program.

Availability

This facility is available to support any application that can benefit from its unique capabilities. To make arrangements to use it, contact the user liaison.

Sandia is a multiprogram laboratory operated by Sandia Corporation, a Lockheed Martin Company, for the United States Department of Energy.

User Liaison

Paul Butler

pbutle@sandia.gov

Sandia National Laboratories

P.O. box 5800, MS-0613

Albuquerque, New Mexico 87185-0613

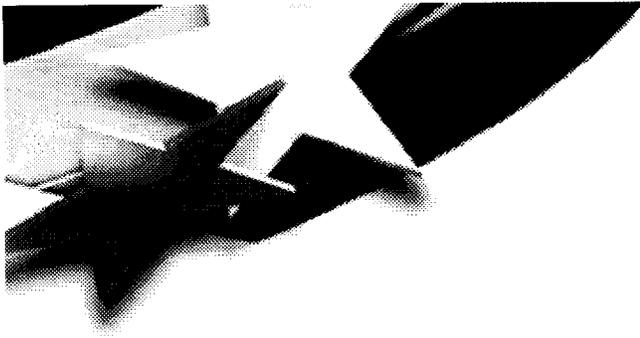
phone: (505) 844-7874

FAX: (505) 844-6972

Last modified: May 22, 2001

[Back to top of page](#) || [Back to User Facilities Page](#) || [Sandia Home Page](#)

[Questions and Comments](#) || [Acknowledgment and Disclaimer](#)



Center for Security Systems

The Center for Security Systems is a fully integrated research-to-development-to application center that provides systems and technologies that understand, identify, and solve the nation's security problems. The Center includes extensive development and testing facilities for all aspects of physical security including the following:

- sensors
- video
- image processing
- alarm communications and display
- entry control
- contraband detection
- insider protection technologies
- barriers and activated delay
- robotics
- modeling and simulation.

The Center contains state-of-the-art test equipment to measure attributes of security equipment, and to collect information about and evaluate the performance of security systems and their individual components. Much of this equipment is located in the center's supporting laboratories:

- Exterior Sensors Testbed
- Video Technology Laboratory
- Robotic Vehicle Range
- Access Delay Technology

and other dedicated laboratories for:

- interior sensors
- biometrics

- image processing
- alarm display and communication.

Modeling and simulation tools are used to duplicate environments and predict system and component effectiveness. Extensive use is made of the latest computing facilities in the development and analysis of new concepts and technologies.

User Support

The Center is supported by an experienced cadre of technical experts well versed in all aspects of security systems and technologies. Over 3000 person years of experience reside in the Center. More than \$250 million has been invested by the government in developing security expertise. Center personnel are experienced in working with industry in the improvement of commercial security equipment.

Availability

This facility is available to support any application that can benefit from its unique capabilities. However, because of the sensitivity of government security applications, some facilities and information may not be available to non-U.S. citizens. To make arrangements to use the Center for Security Systems, contact the user liaison.

Sandia is a multiprogram laboratory operated by Sandia Corporation, a Lockheed Martin Company, for the United States Department of Energy.

User Liaison

Lyle Kruse

lwkruse@sandia.gov

Organization 5800

Sandia National Laboratories

P.O. box 5800

Albuquerque, New Mexico 87185

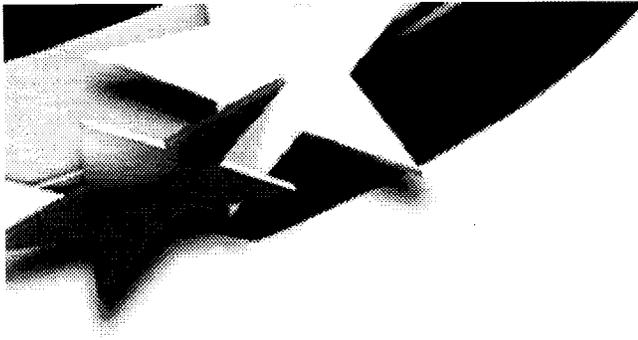
phone: (505) 844-6022

FAX: (505) 845-3262

Last modified: May 22, 2001

[Back to top of page](#) || [Back to User Facilities Page](#) || [Sandia Home Page](#)

[Questions and Comments](#) || [Acknowledgment and Disclaimer](#)



Combustion Research Facility

The Combustion Research Facility (CRF) is a designated user facility of the U.S. Department of Energy. The CRF conducts a broad range of basic and applied research and development in combustion science and technology, aimed at improving our nation's ability to utilize and control combustion processes.

The CRF is internationally recognized for its achievements in combustion science and technology. It integrates research, development, and applications with a unique combination of highly trained, technically diverse staff and specified experimental resources. projects range from basic research on chemical reactivity, fluid dynamics, and state-of-the-art computational modeling to applied studies that support industry's needs in such areas as engines, furnaces, and material processing.

The CRF is a 50,000 sq. ft., multi-building complex that includes laboratories dedicated to...

- Optical wave mixing
- Laser diagnostics development
- Chemical dynamics
- Chemical kinetics
- Specialized user-oriented lasers
- Flame structure studies
- Burner engineering research
- Coal combustion
- Laser remote sensing
- Pulse combustion
- Engine research
- High-temperature materials synthesis
- Spray combustion
- Supercritical water oxidation
- Industrial combustion simulation

User Support

The CRF staff of seventy includes resident research staff, technical, and administrative personnel. It maintains a vigorous visiting researcher program that in recent years has resulted in an average of over 70 long-term appointments of scientists, educators, industrial researchers, and graduate students annually. The CRF also hosts its own [Web page](#).

Availability

The CRF emphasizes collaborative investigations that result in openly published results, but other models for supporting users can be arranged. For more information, contact the User Liaison.

Sandia is a multiprogram laboratory operated by Sandia Corporation, a Lockheed Martin Company, for the United States Department of Energy.

User Liaison

William J. McLean

nrforna@casmtplib.sandia.gov

Combustion Research and Physical Sciences Center

Sandia National Laboratories

P.O. Box 969

Livermore, CA 94551-0969

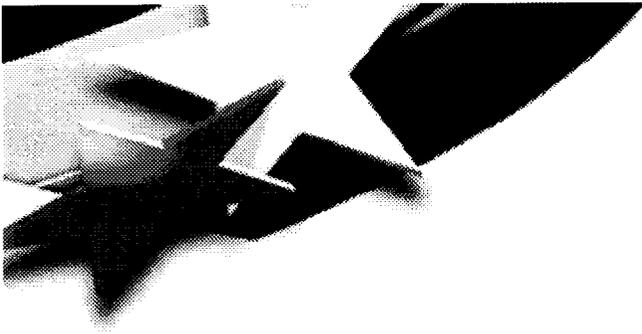
phone: (925) 294-2687

FAX: (925) 294-2276

Last modified: May 22, 2001

[Back to top of page](#) || [Back to User Facilities Page](#) || [Sandia Home Page](#)

[Questions and Comments](#) || [Acknowledgment and Disclaimer](#)



Component Modeling and Characterization Facility

The Component Modeling and Characterization Facility is used to develop Computer Aid to Engineering Models for all types of electronic, electrical and electromechanical components. At the facility we extract SPICE electric circuit simulator model parameters that match a given component to its model over a range of operating variables, including temperature, radiation, and manufacturing variation. All models are verified against data measured in our laboratory.

These models, along with the CAE analysis programs in which they function, allow designers to optimize and troubleshoot circuits and subsystems even before the components are reduced to hardware. Highly accurate models save development time and cost, reducing the numbers of prototypes to optimize a final product. They also provide a quick, inexpensive, and nondestructive tool for analyzing existing systems in trouble. Manufacturers of CAE analysis programs need accurate models to sell their products; component designers and manufacturers can use models first to develop their products, then to attract and assist customers who want components with available models.

The facility has built up a copyrighted library of more than 1600 component models, including relays, transformers, detonators, bipolar transistors, diode, MOSFETs, JFETs, linear integrated circuits, silicon controlled rectifiers, Sprytrons, filters, and magnetic components. Advanced model development is going to cover clocks, resonators, relays, transformers, optoelectronics, detonators, and avalanche mode MOSFETs. These models are unique in industry in their ability to track component performance over a full range of operating conditions, temperatures, and radiation environments. We will make these models available to our User Facility customers on a licensed basis.

The Laboratory equipment includes workstations with parameter extraction and simulation software: DC, AC, and RF measurement

instrumentation, temperature forcing equipment, a Cascade Wafer Probe Station, a model verification system with software, and specialized component fixturing, valued at approximately \$2.5 million.

These facilities, together with our experienced staff, represent an investment in this technology area that is unlikely to be duplicated for use by industrial customers anywhere in the nation.

Availability

Both Sandia staff and L&M personnel on contract to Sandia have spent years developing this Component Modeling and Characterization capability. They will be available to assist users to whatever degree necessary to fit a user's device to an existing model or to develop a new model for the user.

Sandia is a multi-program laboratory operated by Sandia Corporation, a Lockheed Martin Company, for the United States Department of Energy.

User Liaison

Carolyn Bogdan

cwbogda@sandia.gov

Sandia National Laboratories

P.O. Box 5800, MS 0525

Albuquerque, NM 87185-0525

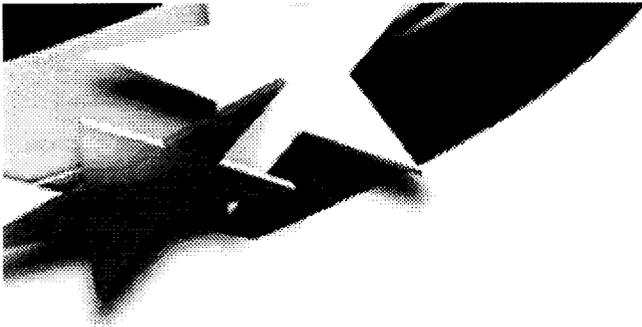
phone: (505) 844-0913

FAX: (505) 844-8168

Last modified: May 22, 2001

[Back to top of page](#) || [Back to User Facilities Page](#) || [Sandia Home Page](#)

[Questions and Comments](#) || [Acknowledgment and Disclaimer](#)



Design, Evaluation and Test Technology Facility

The mission of this facility, which is composed of numerous specialized facilities, is to provide capabilities to simulate a wide range of environments for component and system testing. The environments can range from normal in-use environments to extreme accident conditions. In addition, a wide array of diagnostic equipment, such as nondestructive testing, photometric and optics, and electronic data acquisition, is maintained and developed to support testing and research activities. Tests as diverse as characterization of printed circuit board solder connection strength to full scale impact testing of transport vehicles have been accommodated. These tests can either provide input for numerical simulations or data to verify existing models. Most of the test apparatus was designed and built here and can only be found at Sandia. A close coupling of the development test activities with Sandia's in-house analytical capabilities allows for complete start-to-finish test and evaluation services. In addition, we maintain an ability to handle hazardous or classified test items.

Some of the more unique equipment available for use includes a high-speed rocket sled track, 1.6 million g-lb centrifuge (which can also give a combined vibration and acceleration environment), 40,000 lbf. vibration shakers, climactic testing (including radiant heat and pool fires), nonexplosive pyrotechnic shock simulations, gas and propellant guns, drop towers and aerial cables for high-speed impact testing, ultra-high-speed cameras, mobile laser trackers, and NDT data acquisition techniques, such as high-speed X-rays, filmless real-time radiography, and holography. These capabilities combined with more traditional test facilities such as shock, vibration, force and pressure, modal and structural dynamics, give the customer the unique ability to perform all required tests at one facility.

Test engineers and technicians are available to the user to define, setup, and run tests, as well as provide post test data analysis. Many of the test

personnel are recognized as world-class experts in their field and can provide a scale of expertise that cannot be found elsewhere. Personnel can also provide consultation on required environments, test definition and data requirements, instrumentation development, if needed, test setup and conduct, and data analysis and recommendations.

Availability

Users must provide ES&H documentation of test articles prior to shipment to Sandia. Onsite personnel may have to attend Sandia ES&H training prior to working in the facility. Due to potential hazards involved with testing of this nature, Sandia personnel would be required to assist in the test setup and for the actual conduct of the test, under the direction of the customer's test engineer.

Sandia is a multiprogram laboratory operated by Sandia Corporation, a Lockheed Martin Company, for the United States Department of Energy.

User Liaison

Rodney A. May

ramay@sandia.gov

Sandia National Laboratories

P.O. Box 5800, MS 0555

Albuquerque, NM 87185-5555

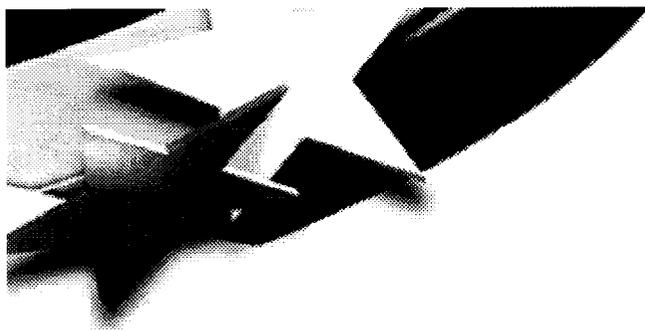
phone: (505) 844-2463

FAX: (505) 844-0078

Last modified: May 22, 2001

[Back to top of page](#) || [Back to User Facilities Page](#) || [Sandia Home Page](#)

[Questions and Comments](#) || [Acknowledgment and Disclaimer](#)



Electronic Technologies User Facility

The Electronic Technologies User Facility works with the U.S. microelectronics industry and universities to develop next-generation manufacturing equipment and processes. It provides a state-of-the-art fabrication environment for research in device and circuit design to meet manufacture-hardened technologies. It is the only industry-compatible microelectronics fabrication facility within the Department of Energy. Its ability to support a broad spectrum of microelectronics projects makes it unique among U.S. integrated circuit facilities.

The ETUF has a 37,500 square foot Microelectronics Development Laboratory (MDL), which contains 22 class-1 cleanroom bays for technology development, each supported by a full complement of design, analysis, and test equipment. The building itself is unique in the IC industry because of the low-vibration design of the structure and the independently supplied clean rooms.

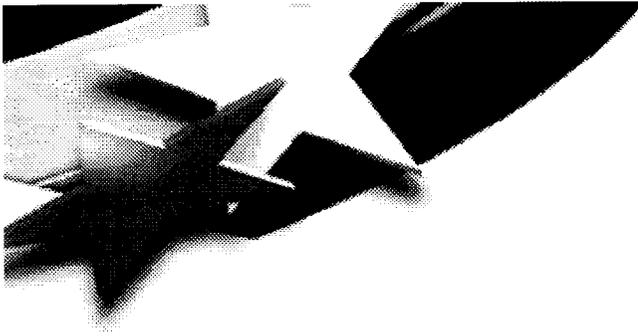
The center features a complete set of state-of-the-art integrated-circuit processing equipment supporting a full 6-inch wafer and 0.35 μ m CMOS/BiMOS technologies. It also supports selected feature sizes smaller than 0.1 μ m and wafer sizes up to 8 inches.

User Support

The ETUF supports users who want to conduct research in the following areas:

- contamination-free manufacturing research
- environmentally conscious manufacturing techniques
- advanced sensor development
- SMART machines
- advanced packaging.

Call the user liaison for more information on cost, services, availability, and test plans.



Electronics Quality/Reliability Center

The Electronics Quality/Reliability Center (EQRC) supports the critical electronics used in Sandia's nuclear weapons mission. This mission drives the EQRC to develop and apply advanced capabilities (facilities, techniques and expertise) in reliability, failure analysis, vulnerability assessment and defect detection. Technologies supported include microelectronics, micromachines, packaging, electrical and electronic components and subassemblies.

The EQRC User Facility only provides access to the subset of its capabilities that are not available from US private companies. Some examples include:

- capability to perform the full set of Sandia's patented failure location techniques

- capability to assess the reliability of micromachines

User Support

The EQRC provides all necessary support services. The center provides utilities including water, power, cooling, and liquid nitrogen. All equipment is calibrated on a regular basis. The laboratories and offices are all connected on a high speed local area network (LAN) with access to printers and plotters. Additionally, the center provides easy access to Internet, and secretarial and administrative support.

Availability

The EQRC is unclassified. It is located in a building that is outside the classified area at Sandia National Laboratory. The EQRC places no additional restrictions on foreign visitors, but fully complies with DOE regulations on the access of foreign visitors. To make arrangements to use the EQRC, contact the user liaison.

More Information

For more information, visit the [EQRC](#) Web site.

Sandia is a multiprogram laboratory operated by Sandia Corporation, a Lockheed Martin Company, for the United States Department of Energy.

User Liaison

Theodore A. Dellin

dellinta@sandia.gov

Sandia National Laboratories

P.O. Box 5800, MS-1071

Albuquerque, New Mexico 87185-1071

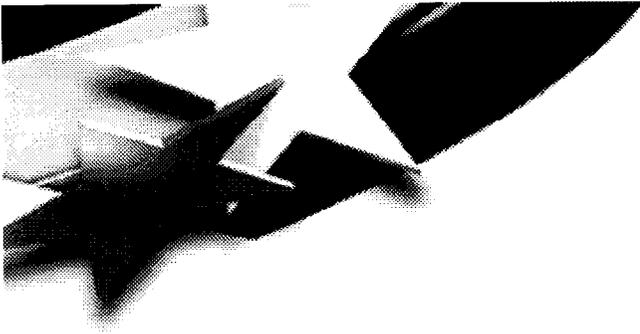
phone: (505) 844-2044

FAX: (505) 844-6735

Last modified: May 22, 2001

[Back to top of page](#) || [Back to User Facilities Page](#) || [Sandia Home Page](#)

[Questions and Comments](#) || [Acknowledgment and Disclaimer](#)



Explosive Components Facility

The 91,000 square foot Explosive Components Facility (ECF) is a state-of-the-art facility that provides a full-range of chemical, material, and performance analysis capabilities for energetic materials and explosive components:

- advanced design of energetic devices and subsystems
- optical ordnance
- energetic materials
- testing of explosives and explosive components and subsystems
- advanced explosives diagnostics
- reliability analyses
- failure modes evaluation
- safety evaluation.

The ECF has the full-range of capabilities necessary to support the understanding of energetic materials and components:

Optical and Semiconductor Bridge (SCB) Initiation Laboratories

Characterization Laboratories

- thermal properties
- gas analyses
- powder characterization
- microscopy
- spectroscopy
- aging and compatibility

Performance Test Facilities

- firing pads (to 1 kg)
- instrumentation (temperature, pressure strain, displacement)
- high-speed camera systems

- optical interferometry (VISAR)
- high-speed data acquisition systems

Real-time Spectroscopy Laboratory

Single-Stage Light-Gas Gun Facility

- piezoelectric gauges
- VISAR (Velocity Interferometer System for Any Reflector)
- flash x-ray
- electrostatic discharge tester (ESD)
- electro-thermal response tester (ETR)

Availability

This facility provides users with a one-stop-contact to Sandia resources. Our staff, with a full-range of degree disciplines and many years of experience, works directly with the user to define customer requirements and develop a plan that leads to solutions. To make arrangements to use the Explosive Components Facility, contact the user liaison.

For more information, visit the [Explosive Technologies Group](#) web site.

Sandia is a multiprogram laboratory operated by Sandia Corporation, a Lockheed Martin Company, for the United States Department of Energy.

User Liaison

Lloyd L. Bonzon

llbonzo@sandia.gov

Sandia National Laboratories

P.O. Box 5800, MS-1454

Albuquerque, New Mexico 87185-1454

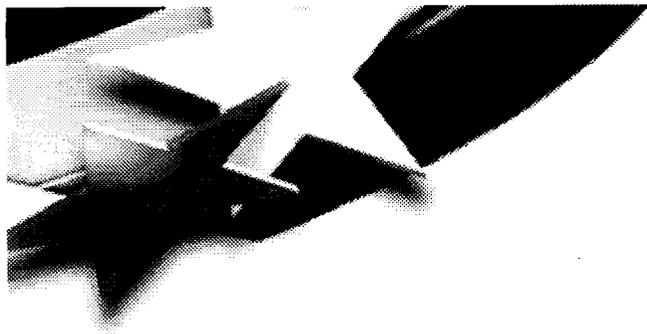
phone: (505) 845-8989

FAX: (505) 844-5924

Last modified: May 22, 2001

[Back to top of page](#) || [Back to User Facilities Page](#) || [Sandia Home Page](#)

[Questions and Comments](#) || [Acknowledgment and Disclaimer](#)



Intelligent Systems and Robotics Center

Sandia National Laboratories' Intelligent Systems and Robotics Center (IRSC) works in diverse application areas:

- small lot flexible automation and materials handling
- reducing the time and cost of cleaning up hazardous waste sites while increasing worker safety
- improving soldier effectiveness in battlefield operations
- computer assisted medical procedures
- faster and cheaper remote maintenance

The IRSC's core technical competencies are:

- automated planning and programming for machine systems
- sensor- and model-based control
- technologies for rapid system integration
- rapid reconfiguration

Using this technical base and application focus, the IRSC delivers value added technologies to its customers:

- rapid physical and virtual prototyping testbeds
- operational first generation machine and software systems
- system engineering tools

The IRSC teams with industry and other laboratories to deliver enabling technologies for complete solutions:

- system integrators
- hardware suppliers
- software suppliers
- collaborative R&D

Availability

This facility is available to support any application that can benefit from

its unique capabilities. The center places a high priority on the safety and health of its users. It provides users with customized training in robotics safety and equipment use.

For more information, visit the [Intelligent Systems and Robotics Systems web site](#).

Sandia is a multiprogram laboratory operated by Sandia Corporation, a Lockheed Martin Company, for the United States Department of Energy.

User Liaison

Pat Eicker

eicker@sandia.gov

Sandia National Laboratories

P.O. Box 5800, MS-1002

Albuquerque, New Mexico 87185-1002

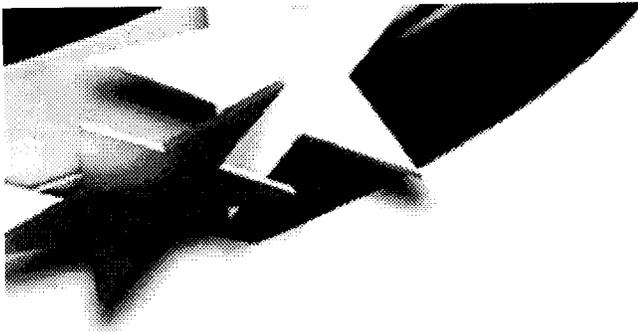
phone: (505) 844-5827

FAX: (505) 844-0037

Last modified: May 22, 2001

[Back to top of page](#) || [Back to User Facilities Page](#) || [Sandia Home Page](#)

[Questions and Comments](#) || [Acknowledgment and Disclaimer](#)



Ion Beam Materials Research Laboratory

Sandia's Ion Beam Analysis (IBA) program is recognized as one of the best in the world. It has the ability to examine a wide spectrum of materials, from semiconductors to metals and ceramics. Some of the accomplishments of the program include:

- Invented several new ion beam analysis techniques for the quantitative analysis of light elements (H through F).
- Perfected a time-of-flight adaptation of our patented HIBS technique for measuring trace levels of metal impurities on Si wafers. Demonstrated micro-monolayer sensitivities, projected to be required for future IC manufacture.
- Enhanced nuclear microprobe-based Single Event Upset (SEU) imaging system to supply submicron images of charge generation and collection in CMOS ICs. This new application of SEU-imaging is important for understanding and decreasing upset susceptibility.

Capabilities and Resources

The IBA is available to perform the following quantitative/standardless analyses:

- Compositional and depth profiling of materials using Rutherford backscattering spectrometry (RBS)
- Measurements of extremely low levels of heavy impurities on light substrates such as Si wafers using heavy ion backscattering spectrometry (HIBS), a technique developed and patented here at Sandia
- Elastic recoil detection using a high energy, heavy ion beam (for example, 28 MeV Si) to recoil or knock light elements from a target. This enables the profiling of very light elements such as H.
- Time-of-flight elastic recoil detection using a time-of-flight detector to achieve much higher depth resolution (1nm) and permit the separation of different isotopes of the element.
- Ion channeling to probe the atomic structure of a material in the near surface, allowing the depth profiling of defects and strain

- External ion beam analysis on a variety of materials that cannot be placed in a vacuum system
- Quantitative elemental analysis using particle-induced x-ray emission with detection sensitivities of $\mu\text{g/g}$
- 3-dimensional elemental distribution maps.

The IBA places the following equipment at the service of its industry partners:

- 6 MV tandem Van de Graaff accelerators for analyses requiring high energies (for example, light element profiling and high energy backscattering).
- Van de Graaff accelerator for more routine IBA techniques such as RBS and channeling.
- Cockroft Walton accelerator, which can operate up to 350 KV, for the HIBS analysis.

Availability

This facility is available to support any based firm that has applications that can benefit from its unique capabilities. To make arrangements to use the Ion Beam Materials Research Laboratory, contact the user liaison or visit the IBA [Table of Elements](#) site to quickly retrieve information on the sensitivity, depth of analysis and depth resolution of most of the modern ion beam analysis techniques in a single easy to use format; a periodic table.

Sandia is a multiprogram laboratory operated by Sandia Corporation, a Lockheed Martin Company, for the United States Department of Energy.

User Liaison

Barney L. Doyle

bldoyle@sandia.gov

Sandia National Laboratories

P.O. Box 5800, MS-1056

Albuquerque, New Mexico 87185-1056

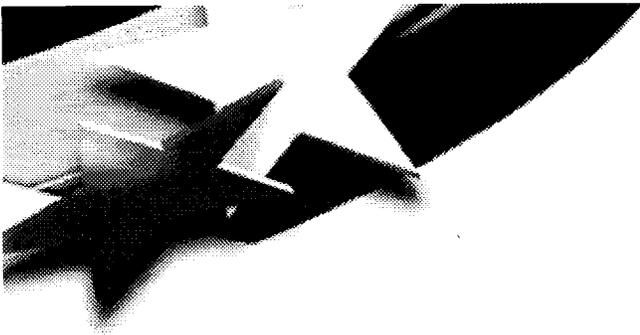
phone: (505) 844-7568

FAX: (505) 844-7775

Last modified: May 22, 2001

[Back to top of page](#) || [Back to User Facilities Page](#) || [Sandia Home Page](#)

[Questions and Comments](#) || [Acknowledgment and Disclaimer](#)



Manufacturing Technologies Center

Our mission is to make our customer successful through our excellence in manufacturing technologies. We focus on manufacturing derived from Sandia's national security mission. We enhance our capabilities through collaborations with Sandia's Energy and Environment sector, other federal agencies, industry, and universities. We strive to deliver goods and services that consistently exceed customer expectations.

The Manufacturing Technologies Center has been certified as a Technology Deployment Center and User Facility (TDC/UF) by the DOE. As such, our facilities, equipment, instrumentation, and scientific expertise are accessible to outside users as long as the programmatic needs of the DOE are not compromised.

As a TDC/UF our capabilities in mechanical, electronic, and materials processes within the Manufacturing Technologies Center are unique and clearly not readily available anywhere in the nation, particularly as a complete, synergistic and functional program.

Adhesive Bonding	Ceramic Chemistry & Physics	Ceramic Processing
Coatings	Component Fabrication & Manufacturing	Composites
Electronic Fabrication	Electronic Inspection	Electronic Packaging
Encapsulation	Glass Chemistry	Glass Melting and Sealing
Hexapod	High Speed Machining	Information Management
Joining	Laser Engineered Net Shaping	Lithography
Machining	Magnetic Laboratory	Manufacturing Liaison
Materials Characterization	Mechanical Measurements & Calibration	Mechanical Testing
Molding, Thermoforming, Coating, & Compounding	Numerical Control Programming	On-Machine Acceptance
Open Architecture Control	Predictive Maintenance	Rapid Prototyping
Thin Film	Vacuum Engineering	Vacuum Processes
Virtual Manufacturing Applications System	Welding, Fabrication, & Metal Forming	

Staffed with process engineers, we are ready to give technical advice and work with approved prospective users. The Center also has a number of technicians and tradespeople who possess extensive training and experience in operating sophisticated equipment in a number of areas.

In the normal course of executing a project, the user will be on-site intricately involved with experiments and will conduct the actual work, where appropriate. In cases where extensive or specialized training is required to operate equipment, or when activities occur in parallel, the work will be performed by trained personnel under the direction of the user. The Center's traditional role as a service organization affords a special opportunity to take full advantage of laboratory wide support capabilities, in that Center personnel are already well accustomed to working across functional lines.

It is fully anticipated that users will often be able to complete projects in a single visit. Modern methods of communication are available to the user for saving on travel time and expense including: Internet, voice mail, FAX, video and voice conferencing.

You may access additional information about our Center via our Home Page at: http://mfgshop.sandia.gov/1400_ext/1400_ext.htm

If you would like a brochure about our facilities mailed to you, or a copy of the TDC/UF agreement, please contact the user liaison listed below.

Availability

This facility is available to support any applications that can benefit from

its unique capabilities. To make arrangements to use the Manufacturing Technologies Center, contact the user liaison.

Sandia is a multiprogram laboratory operated by Sandia Corporation, a Lockheed Martin Company, for the United States Department of Energy.

User Liaison

Joe M. Harris

jmharri@sandia.gov

Sandia National Laboratories

P.O. Box 5800, MS-0961

Albuquerque, New Mexico 87185-0961

phone: (505) 844-8344

FAX: (505) 845-6584

Carla D. Chirigos

cdchiri@sandia.gov

Sandia National Laboratories

P.O. Box 5800, MS-0960

Albuquerque, New Mexico 87185-0961

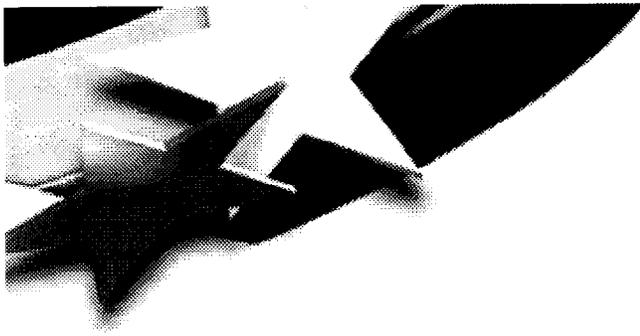
phone: (505) 845-8645

FAX: (505) 844-2977

Last modified: May 22, 2001

[Back to top of page](#) || [Back to User Facilities Page](#) || [Sandia Home Page](#)

[Questions and Comments](#) || [Acknowledgment and Disclaimer](#)



Materials and Process Diagnostics Facility

The Materials and Process Diagnostics Facility was organized as a collaborative venture of Sandia, the University of New Mexico, and Los Alamos National Laboratory to address national initiatives in materials synthesis, processing, and manufacturing. The 45,000 square foot laboratory, which opened in August, 1992, is conveniently located in the University Center Research Park, just north of the Albuquerque airport. The facility is equipped with a broad range of state-of-the-art equipment for materials synthesis, processing, and characterization. Facilities available in the facility include:

Bulk Synthesis and Processing

- class 100 and 1000 clean rooms for materials synthesis
- glass and ceramic synthesis and characterization laboratory:
 - 1700 C furnaces, 2500 C vacuum furnace, isostatic press, vacuum hot press
- powder synthesis and characterization laboratory:
 - aerosol, supercritical, and hydrothermal synthesis; milling, forming, and firing; particle size, zeta potential, electrophoretic mobility, density, and X-ray phase measurements
- welding, brazing, and soldering laboratory
 - cleaning studies; lead-free and fluxless solder development

Processing and Analysis of Films

- membrane and sensor fabrication and characterization laboratory:
 - synthesis of microporous materials, porosity analysis, gas membrane permeability
- laboratory for solution processing of thin films:
 - Lanmuir-Blodgett films for optical and sensor applications, ellipsometry, atomic force and scanning-tunneling microscopy
- thick and thin film deposition laboratory:
 - magnetron sputtering of metals and insulators, adhesion, contact angle, friction and wear measurements

Materials Characterization

- small angle x-ray scattering facility
- surface science laboratory:
 - Auger spectrometry, XPS, ion microprobe
- Electron Paramagnetic Resonance (EPR) spectroscopy laboratory:
 - low and high temperature EPR, device testing
- thermal analysis laboratory:
 - DTA, TGA, DSC, DMA, thermal expansion
- FTIR spectroscopy

Availability

Highly-qualified post doctoral fellows are part of the research teams working on many facility R&D programs. Space can be provided at the facility for collaborations with scientists from U.S. industry to facilitate transfer of technology developed at the laboratory.

The facility is available to support any application that can benefit from its unique capabilities. To make arrangements to use the facility, contact Walter Schimmel, (505) 843-4147, or the appropriate user liaison.

Sandia is a multiprogram laboratory operated by Sandia Corporation, a Lockheed Martin Company, for the United States Department of Energy.

User Liaison

Ronald E. Loehman

loehman@triton.unm.edu

1001 University Blvd. SE, Suite 100
Albuquerque, New Mexico 87106
phone: (505) 272-7601
FAX: (505) 272-7304

Abhaya Datye

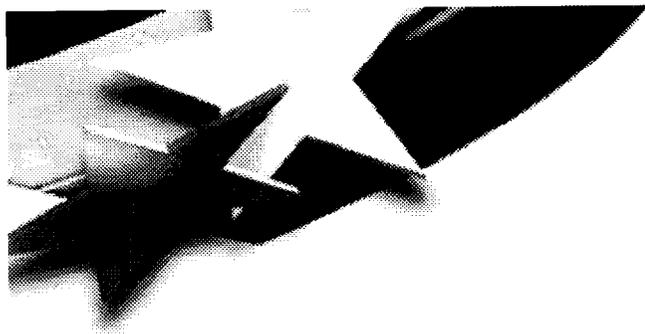
datye@unm.edu

UNM/NSF Center for Micro-Engineered Materials
University of New Mexico
Albuquerque, New Mexico 87131
phone: (505) 277-4077
FAX: (505) 277-1024

Last modified: May 22, 2001

[Back to top of page](#) || [Back to User Facilities Page](#) || [Sandia Home Page](#)

[Questions and Comments](#) || [Acknowledgment and Disclaimer](#)



Mechanical Test and Evaluation Facility

The Mechanical Test and Evaluation Facility supports research in advanced nonlinear constitutive modeling of the thermomechanical behavior of solids. Its 20,000 square-feet of laboratory space provides a state-of-the-art environment for research in

- multiaxial deformation and failure
- temperature and rate-dependent behavior
- non-coulomb friction
- non-newtonian rheology
- high pressure fluid flow
- 3D laser velocimetry
- transient compressible flow
- environmental testing

The facilities staff, all with specialized expertise, provide assistance with

- modeling
- materials testing
- mechanical design
- data reduction

Availability

This facility is available to support any application that can benefit from its unique capabilities. To make arrangements to use the Mechanical Test and Evaluation Facility, contact the user liaison.

Sandia is a multiprogram laboratory operated by Sandia Corporation, a Lockheed Martin Company, for the United States Department of Energy.

User Liaison

Wendell Kawahara

wakawah@sandia.gov

Sandia National Laboratories

P.O. Box 969, MS 9044

Livermore, CA 94551-0969

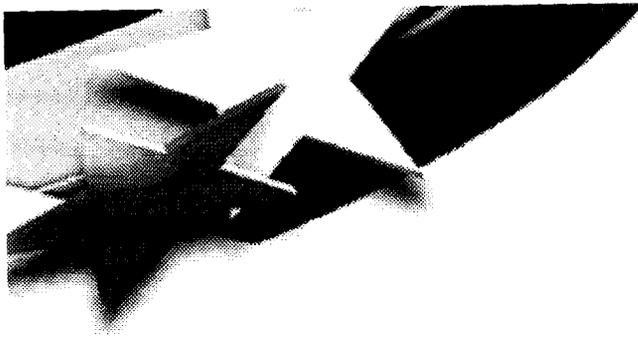
phone: (925) 294-2614

FAX: (925) 294-7459

Last modified: May 22, 2001

[Back to top of page](#) || [Back to User Facilities Page](#) || [Sandia Home Page](#)

[Questions and Comments](#) || [Acknowledgment and Disclaimer](#)



National Solar Thermal Test Facility

Solar thermal components and systems are developed, researched, and tested at this large facility. We also conduct tests on other technologies where intense thermal flux is needed. Large-scale solar concentrators can be used for optical experiments such as astronomy and laser applications. Solar thermal systems and their support capabilities provide unmatched flexibility for testing, for example:

- Unique 61-meter (200-foot) ^{Tower} has four test stations and an associated field of 220 computer-controlled tracking mirrors that provide 5MW of total thermal power at a peak flux of 260 W/cm², used to evaluate solar heat engines and associated solar thermal receivers.
- Engine test laboratory performs ground-testing of solar receivers and externally heated engines.
- Two solar furnaces, having 16 and 60 kW total power ratings, support testing of solar components, processes, and high-temperature materials.
- Parabolic troughs generate process heat and photocatalytically destroy organic contaminants in ground water.
- Computer controlled test platform rotates to follow the sun's position; associated fluid loop supports testing of components and systems, such as troughs.
- Windowed wind tunnel permits characterization of the effect of nuclear thermal flash during simulated flight conditions.
- Large-scale optical systems act as light collectors for astronomy research and for various laser applications.

Support capabilities include data acquisition and control equipment, a large assembly building with machine shop, fork lifts and aerial platforms, and heat rejection and thermal transport equipment for a variety of working fluids. Staff includes mechanical, electric power, controls, software engineers, electrical and mechanical technicians, welder/assemblers, and a journeyman electrician.

The staff has more than ten years experience on solar applications and

thermal simulations requiring high heat flux.

Test personnel support all stages of experiments.

Availability

First come, first served basis to government agencies and to the private sector. Proposed project activities must not compete with those offered in the private industry.

- Private sector organizations can contract for use of these facilities and services through a Designated User Facility Agreement;
- Government organizations can contract with Sandia through a Work for Other Agreement.

Both agreements are easy to implement and provide for cost reimbursement for the use of Sandias staff and facilities. There is no fee to use Sandia facilities.

For more information, visit the [National Solar Thermal Test Facility Web site](#).

Sandia is a multiprogram laboratory operated by Sandia Corporation, a Lockheed Martin Company, for the United States Department of Energy.

User Liaison

Jim Chavez

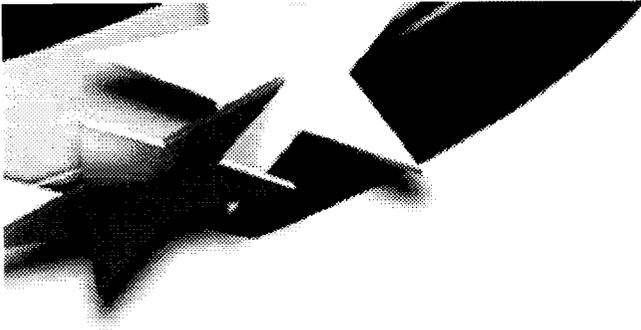
jmchave@sandia.gov

Sandia National Laboratories
P.O. Box 5800, MS 1127
Albuquerque, NM 87185-1127
phone: (505) 844-4485
FAX: (505) 845-3366

Last modified: May 22, 2001

[Back to top of page](#) || [Back to User Facilities Page](#) || [Sandia Home Page](#)

[Questions and Comments](#) || [Acknowledgment and Disclaimer](#)



NUFAC Nuclear Facilities Resource Center

The Nuclear Facilities Resource Center (NUFAC) represents an exceptional national resource in providing unique capabilities for developing and applying nuclear solutions to problems of national importance.

NUFAC's nuclear engineering technology resource is derived from a combination of unique facilities and highly qualified people in a synergistic organizational structure. NUFAC can support a wide diversity of programs including designing, operating, and experimenting with nuclear reactors; performing incore testing of reactor fuel and criticality experiments; radiation processing of semiconductor materials; testing of electronic piece parts and components; performing activation analyses; characterizing radioactive materials; and producing radioisotopes.

Facilities

Interrelated facilities include:

- Annular Core Research Reactor
- Hot Cell Facility
- Gamma Irradiation Facilities
- Sandia Pulse Reactor Facility
- Californium-252 source
- State-of-the-art dosimetry, diagnostic, data acquisition, modeling and analysis capabilities

The Center has the analytical and experimental infrastructure necessary to meet customer needs in the following areas:

- design nuclear facilities and assess their safety
- modify facilities to meet experimenter's needs
- characterize radiation environments produced
- support research, development, testing and evaluation of experiments
- neutron and ion single-event effects testing

Availability

This facility is available to support any application that can benefit from its unique capabilities. To make arrangements to use this facility, contact the User Liaison.

Sandia is a multiprogram laboratory operated by Sandia Corporation, a Lockheed Martin Company, for the United States Department of Energy.

User Liaison

Ted Luera

tfluera@sandia.gov

Sandia National Laboratories

P.O. Box 5800, MS 1146

Albuquerque, NM 87185-1146

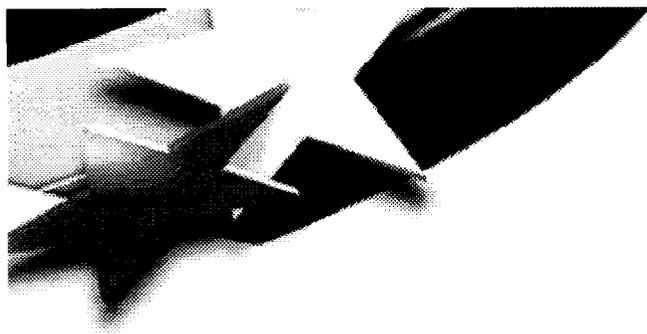
phone: (505) 845-3026

FAX: (505) 284-3651

Last modified: May 22, 2001

[Back to top of page](#) || [Back to User Facilities Page](#) || [Sandia Home Page](#)

[Questions and Comments](#) || [Acknowledgment and Disclaimer](#)



Photovoltaic Laboratories

Sandia's Photovoltaic Laboratories work with the photovoltaic industry and energy users to accomplish two valuable primary functions:

- speed the commercial use of photovoltaic energy systems
- aid in understanding and improving the performance of those systems

The Photovoltaic Device Fabrication Laboratory (PDFL) is a clean room facility that supports process development for the fabrication of silicon photovoltaic cells and related devices. It provides the following services:

- characterizing semiconductor processes including chemical cleaning, texture-etching, laser grooving, image-reversal lift-off, impurity gettering, phosphorus diffusion, silicon nitride deposition, and plating
- developing new silicon devices including the emitter wrap-through cell and high-efficiency cells on industrial materials
- developing new processing techniques such as low-temperature surface passivation and mechanical surface texturing

The Photovoltaic Device Measurement Laboratory (PDML) accepts photovoltaic cells and photosensors for

- performance characterization
- calibration of reference detectors in measurement equipment
- laser beam induced current scanning for examining spatial defects and grain boundaries
- optical measurement equipment
- spectral response and laser scanning system
- data analysis of electrical parameters

The Photovoltaic System Evaluation Laboratory (PSEL) provides several buildings and outdoor sites for evaluating PV hardware. It includes the following capabilities:

- system evaluations
- performance testing for modules, power processors, charge controllers, and batteries
- on-site education and training on the attributes and limitations of photovoltaic power system

Availability

The Photovoltaic Laboratories are available to support any application that can benefit from their unique capabilities. To make arrangements to use these facilities, contact either of the user liaisons.

Sandia is a multiprogram laboratory operated by Sandia Corporation, a Lockheed Martin Company, for the United States Department of Energy.

User Liaisons

Marjorie L. Tatro

mltatro@sandia.gov

Sandia National Laboratories
P.O. Box 5800, MS 0752
Albuquerque, NM 87185-0752
phone: (505) 844-3154
FAX: (505) 844-6541

David L. King

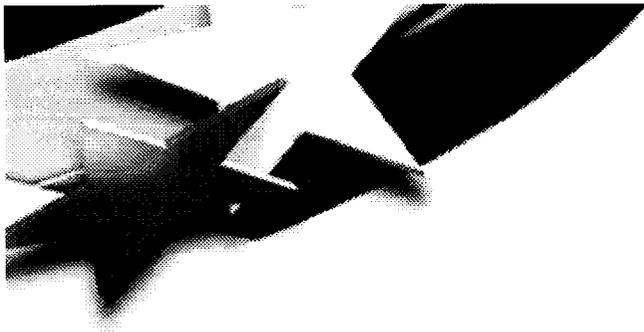
dlking@sandia.gov

Sandia National Laboratories
P.O. Box 5800, MS 0752
Albuquerque, NM 87185-0752
phone: (505) 844-8220
FAX: (505) 844-6541

Last modified: May 22, 2001

[Back to top of page](#) || [Back to User Facilities Page](#) || [Sandia Home Page](#)

[Questions and Comments](#) || [Acknowledgment and Disclaimer](#)



Plasma Materials Test Facility (PMTF)

The Plasma Materials Test Facility (PMTF), located outside the security area at Sandia National Laboratories, New Mexico, performs high heat flux (HHF) testing and analyses in support of DOE fusion power programs. These activities span a wide spectrum, including thermal shock tests on passively cooled materials, thermal response and thermal fatigue tests on actively cooled components, critical heat flux-burnout tests, braze reliability tests, and safety-related tests. Thermal hydraulic and thermal stress analyses of these experiments, as well as computer modeling of plasma evolution and disruptions, are also performed. Research areas include advanced heat exchangers, novel high-temperature materials, and innovative joining techniques, such as diffusion bonding, specialty brazing, explosion bonding, and hot isostatic pressure processing. Many of these areas overlap the interests of commercial enterprises in the space, aerospace, and the nuclear industries.

Capabilities and Resources

Sandia's PMTF houses world-class, state-of-the-art HHF test equipment. The PMTF comprises several major systems, including two electron-beam systems, the EB-1200 and the EBTS. Both systems are used to expose heat exchangers and actively cooled components to intense surface heat loads. Detailed thermal-hydraulic experiments and analyses are performed by expert staff on advanced heat-exchanger designs. In addition, experiments and failure analyses are conducted on advanced high-temperature materials and joining techniques. The staff includes six Ph.D.s with more than 100 combined years of professional experience in HHF testing, thermal hydraulics, stress analysis, and component development; three BS-level engineers, and six highly-trained technicians.

The EB-1200 electron-beam system is used to test medium-scale (1m x 1m) components and prototypes, whereas the EBTS is used for HHF testing and research on small prototypes (10cm x 10cm). The systems share a state-of-the-art, nuclear-grade, high-pressure, high-temperature water-flow loop that can supply high-quality coolant water (de-ionized

and demineralized) over a wide range of conditions: flow rates as great as 30 l/s, pressures as high as 7 MPa, and inlet temperatures as high as 280i C. The operation of the 1.2 MW EB-1200 electron-beam system with sophisticated infrared and laser diagnostics, bore scopes, optical pyrometers, strain gauges, linear deflection transducers, and thermocouple arrays makes the PMTF a unique facility. The EB-1200 can deposit 1.2 million watts over areas as large as 0.5 m x 0.8 m. The 30 kW EBTS is equipped with the only closed helium coolant loop in the United States for testing of helium-cooled components and heat exchangers. The PMTF also houses a fully equipped computer laboratory for analytical and experimental support of high-heat flux experiments. Thermal hydraulic and thermal stress modeling of experiments is routinely performed using the ABAQUS and PATRAN codes. In addition, custom software was developed to model plasma behavior and runaway electron generation. Extensive graphics packages are available for data visualization, as well as CAD programs for sample design.

Availability

This facility is available to support any private firm, university, or state or local government that requires high-heat flux testing or can benefit from its thermal-hydraulics, materials, and joining experience. Federal agencies can use the PMTF under an integrated contractor order (ICO). To make arrangements to use the PMTF, contact the user liaison.

Sandia is a multiprogram laboratory operated by Sandia Corporation, a Lockheed Martin Company, for the United States Department of Energy.

User Liaisons

Dennis Youchison

dlyouch@sandia.gov

Sandia National Laboratories

P.O. Box 5800, MS 0961

Albuquerque, NM 87185-0961

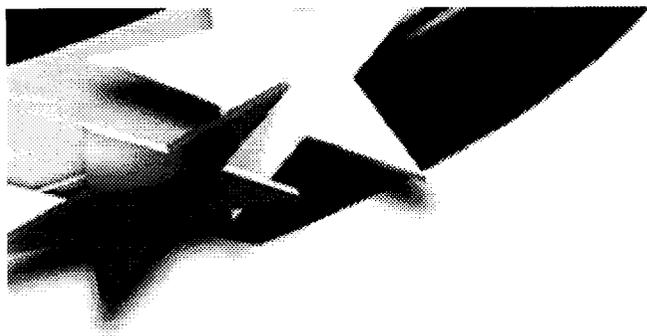
phone: (505) 845-3138

FAX: (505) 845-3130

Last modified: May 22, 2001

[Back to top of page](#) || [Back to User Facilities Page](#) || [Sandia Home Page](#)

[Questions and Comments](#) || [Acknowledgment and Disclaimer](#)



User Facilities Primary Standards Laboratory

The Primary Standards Laboratory (PSL) develops and maintains primary standards that are traceable to national standards and calibrates and certifies customer reference standards. The PSL also provides technical guidance, support, and consultation, and helps to develop precision measurement techniques and provide measurement uncertainty analysis.

Capabilities and Resources

The Primary Standards Laboratory offers the following capabilities:

- Dimensional

Angular ring gages, length and diameter, step gages, line standards, measuring wires, optical reference planes, roundness, plug/ring gages, surface texture, threaded plug and ring gages, surface texture, and two dimensional gages

- Electromagnetic-DC/low frequency voltage/current converters, capacitance dividers, current transformers, DC resistance, DC voltage, high frequency voltage, inductive dividers, LF AC voltage, LF capacitance, LF inductance, LF power/energy, mixed dividers, power-frequency capacitors, resistance dividers, voltage transformers, DC high voltage ratio, DC current shunts
- Electromagnetic-RF/Microwaves coaxial air line standards, coaxial/wave-guide terminations, dielectric materials, microwave couplers/splitters, thermistor mount efficiency and/or calibration factor, noise temperature, pulse/CW power, RF/microwave attenuators, RF/microwave phase shifters

- Ionizing Radiation

Radiation dosimetry of X-rays, gamma rays, high-dose dosimetry, neutron sources and dosimeters, radioactive sources

- Mechanical flow rate, force, mass, vibration, shock
- Optical Radiation

Laser power energy, photometric, radiometric, spectrophotometric, UV radiometric

- Thermodynamic

Humidity, laboratory thermometers, leak artifacts, pressure, radiation thermometry, resistance thermometry, thermocouples and pyrometers, vacuum and low pressure gages, vacuum and low pressure transducers

- Time and Frequency

Frequency dissemination, time dissemination, oscillator characterization

For a definitive set of our capabilities, see our web page at: <http://www.sandia.gov/psl>. We are also accredited under Lab Code 105002 by the National Institute of Standards and Technology/National Voluntary Laboratory Accreditations Program. See <http://ts.nist.gov/ts/htdocs/210/214/14.html> for details.

User Support

The Primary Standards Laboratory has invested extensively in its facility, equipment, hardware, and software. Capabilities available include:

- state-of-the-art environmental control laboratory
- professional staff at PhD level
- unique standard in pulsed neutrons, gas leaks, pulsed high voltage, microwaves
- Portable Josephson volt standard
- M48 Universal Coordinate Measuring Machine

Availability

This facility is available to support any firm whose applications can benefit from its unique capabilities. To make arrangements to use the Primary Standards Laboratory, contact the user liaison.

Sandia is a multiprogram laboratory operated by Sandia Corporation, a Lockheed Martin Company, for the United States Department of Energy.

User Liaisons

Larry Azevedo

ljazeve@sandia.gov

Sandia National Laboratories

P.O. Box 5800, MS 0665

Albuquerque, NM 87185-0665

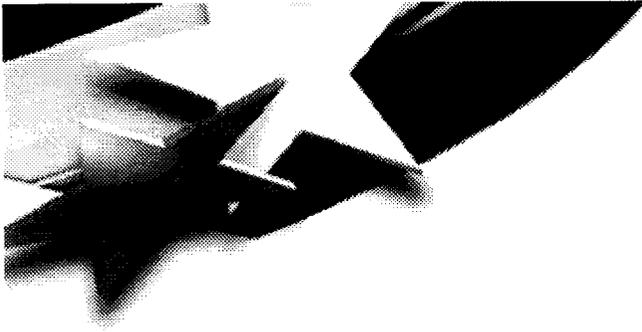
phone: (505) 844-7700

FAX: (505) 844-4372

Last modified: May 22, 2001

[Back to top of page](#) || [Back to User Facilities Page](#) || [Sandia Home Page](#)

[Questions and Comments](#) || [Acknowledgment and Disclaimer](#)



User Facilities Pulsed Power and System Validation Facility

The Pulsed Power and System Validation User Facility offers access to unique equipment to support specialized research, along with the expertise to address complex problems dealing with radiation effects.

User Support

The knowledgeable staff brings a broad spectrum of experience in the design and setup of experiments. Emphasis is placed on optimizing the operation and results of the facility's large radiation sources in support of the following applications:

- High explosive design and testing, including test range facilities and world-recognized expertise on specialized explosive applications
- Electronics and materials research on the effects of radiation
- Development and application of specialized radiation transport and electromagnetic computer codes (Integrated Tiger Series, Quicksilver, and others)
- Investigating intense magnetic fields and their effects
- Research on extremely high power levels (>200TW), high x-ray energy output (2.0 MJ) and high hohlraum temperature (>150eV)

The facilities state-of-the-art equipment resources include:

- Z x-ray source, world's most powerful pulsed power facility
- Saturn x-ray and HERMES gamma-ray sources for large area, volume exposures
- SPHINX x-ray source for small area exposures
- SABRE e-beam or x-ray source for moderate exposures
- RHEPP repetitive pulsed high energy source
- SPR pulsed reactor neutron and long gamma pulse source

Some of the facilities past and on going research efforts are on the

leading edge of pulsed power and system validation techniques:

- Development of the largest, most powerful x-ray and y-ray sources in the world
- Development of ion beam technology to harden materials and extend the material lifetime
- Radiation transport and electromagnetic code design, development, and authorship
- Development of repetitively pulsed power sources to sterilized medical waste, timber, or food products
- Design and test of explosively-driven valves for specialized applications; one such valve sealed a 48-inch diameter pipe in 30-ms

Availability

This facility is available to support any application that can benefit from its unique capabilities. Arrangements can be made by contacting one of the user liaisons.

Sandia is a multiprogram laboratory operated by Sandia Corporation, a Lockheed Martin Company, for the United States Department of Energy.

User Liaisons

Paul Raglin

psragli@sandia.gov

Sandia National Laboratories
P.O. Box 5800, MS 1165
Albuquerque, NM 87185-1165
phone: (505) 845-7049
FAX: (505) 845-7498

Roy Hamil

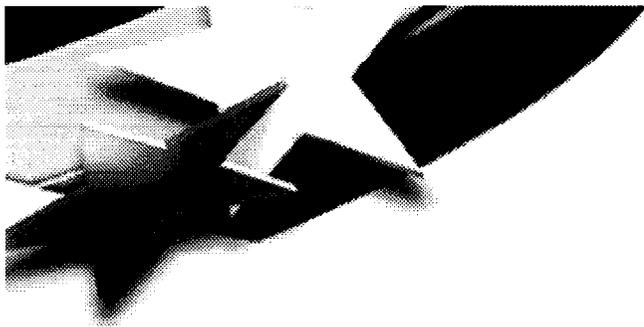
rahamil@sandia.gov

Sandia National Laboratories
P.O. Box 5800, MS 1178
Albuquerque, NM 87185-1178
phone: (505) 845-3682
FAX: (505) 845-7841

Last modified: May 22, 2001

[Back to top of page](#) || [Back to User Facilities Page](#) || [Sandia Home Page](#)

[Questions and Comments](#) || [Acknowledgment and Disclaimer](#)



Radiation Detector Analysis Laboratory

The Nuclear Spectroscopic Testing Facility provides assistance to users from federal laboratories, U.S. industry and academia in the following areas: (1) testing and characterizing room-temperature semiconductor spectrometers and detection arrays to incident x-rays, gamma rays and neutrons; and (2) determining the relationships between the physical properties of the detector materials and the device response.

User Support

The facility's special capabilities include:

- low-noise environment to test solid-state detectors for x-ray, gamma-ray, and neutron response
- mass spectrometry to quantify contaminants in detectors and detector-grade materials
- photoluminescence and thermally-stimulated current to measure carrier traps in detectors
- current-voltage, capacitance-voltage, and photoconductivity equipment to measure electrical properties of devices

The facility also offers a professional and technical staff skilled in electronics, characterization of deep-level traps and carrier recombination centers, device fabrication, and detector testing.

Availability

This facility is available to support any application that can benefit from its unique capabilities.

Sandia is a multiprogram laboratory operated by Sandia Corporation, a Lockheed Martin Company, for the United States Department of Energy.

User Liaison

Ralph James

rbjames@sandia.gov

Sandia National Laboratories

P.O. Box 969, MS 9409

Livermore, California 94551-9409

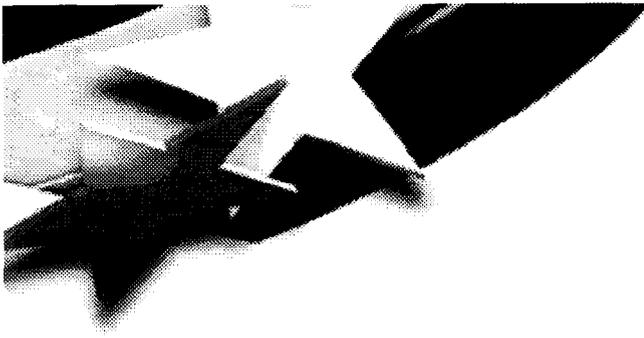
phone: (925) 294-2782

FAX: (925) 294-3231

Last modified: May 22, 2001

[Back to top of page](#) || [Back to User Facilities Page](#) || [Sandia Home Page](#)

[Questions and Comments](#) || [Acknowledgment and Disclaimer](#)



Sandia Orpheus Site

The Orpheus facility is a test site and a mobile laboratory of the Geothermal Research Department that is used to design and evaluate methods for employing acoustic waves in deep wells. This includes both remote inspection of and communication with down-hole equipment. These are not audible waves which one normally associates with acoustic measurements, but rather stress waves which are trapped in the steel tubulars and which are relatively inaudible. To achieve our goals, we use this facility to:

- measure and analyze the source and amount of acoustic attenuation in commercial well tubulars (including production tubing and drill pipe).
- prototype and test components for data transmission in steel tubulars.
- simulate entire communication systems which employ well tubulars as a transmission medium.
- collect and analyze wave propagation data at our test site.
- collect and analyze wave propagation data at remote wells.
- characterize ambient noise levels in tubulars at remote wells.

The Orpheus facilities have been in existence since 1991. Our primary function is to support research programs for the Geothermal Technology Division and the Natural Gas and Oil Technology Partnership (both DOE). This facility is crucial to development and testing of communication and measurement systems for use in recovery of geothermal, oil, and gas resources. To our knowledge, no similar facility is in existence in the world.

The Orpheus facility is located outside of the classified areas of Sandia National Laboratories and, therefore, is subject to only minimal access regulations. It is in close proximity to Albuquerque, and Sandia staff will always be on site to assist and supervise operations.

Sandia is a multiprogram laboratory operated by Sandia Corporation, a Lockheed Martin Company, for the United States Department of Energy.

User Liaison

Douglas S. Drumheller

dsdrumh@sandia.gov

Sandia National Laboratories

P.O. Box 5800, MS-1033

Albuquerque, New Mexico 87185-1033

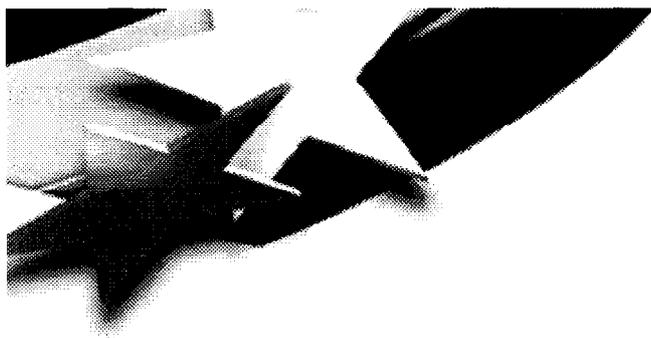
phone: (505)844-8920

FAX: (505) 844-3952

Last modified: May 22, 2001

[Back to top of page](#) || [Back to User Facilities Page](#) || [Sandia Home Page](#)

[Questions and Comments](#) || [Acknowledgment and Disclaimer](#)



Shock Technology and Applied Research Facility (STAR)

The STAR Facility is a state-of-the-art facility which can provide a full range of projectile/target interactions. Impact velocities from 0.01 to 16km/s are available with a broad range of diagnostic and analysis capabilities. A diverse technical staff with many years of experience is available for consultations.

Typical areas of study include:

- Advanced Bumper Shield Design
- Amor/Anti-Armor
- High Pressure Equation-of-State
- Hydrocode Validation
- Precision Ballistic Impacts
- Shock Induced Vaporization Toxic and Hazardous Materials Testing.

A variety of major gun impact systems is available, including two 100 mm compressed gas guns (to 1km/s; one for inclined impacts); an 89 mm powder gun (0.5 - 2.3 km/s), and three 2-stage light gas guns (bores to 28 mm; velocities to 7 km/sec). The Hypervelocity Launcher Facility (6 -19 mm metal plates to 16 km/s) is an add-on to the largest 2-stage gun system. Smaller gun systems are also available.

Instrumentation and diagnostic capabilities include:

- Velocity Interferometry (VISAR)
- Flash X-rays
- Holograms of Ballistic Impacts and Debris Generation
- Optical Multi-Channel Spectroscopy of Impact Flash Events
- Photometrics-Fast Framing and Streak Cameras
- Polyvinylidene Difluoride (PVDF) Gauges
- 187 Channels of Digital Recording Instrumentation
- 21 Channels of High Frequency Analog Recording Instrumentation

On Site Facility Support:

- Machine Shop/Dark Room
- Cleanroom Optics Lab
- Electronics Development Lab Lapping Facility
- Computers and software for data reduction/interpretation

Availability

A complete technical and scientific staff is available to aid in the definition and execution of an experimental program and in the reduction of data. As well, some of the premier computational modeling facilities and codes in the world are easily available for problem characterization if needed. Contact the user liaison for more information.

For more information, visit the [Explosives Technologies Group Web site](#).

Sandia is a multiprogram laboratory operated by Sandia Corporation, a Lockheed Martin Company, for the United States Department of Energy.

User Liaison

Michael D. Furnish

mdfurni@sandia.gov

Sandia National Laboratories

P.O. Box 5800, MS-1169

Albuquerque, New Mexico 87185-1169

phone: (505) 844-2877

FAX: (505) 845-7685

Last modified: May 22, 2001

[Back to top of page](#) || [Back to User Facilities Page](#) || [Sandia Home Page](#)

[Questions and Comments](#) || [Acknowledgment and Disclaimer](#)