Department of Energy

FY 2009 Laboratory Directed Research and Development at the DOE National Laboratories Report to Congress

April 2010

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Executive Summary

The Laboratory Directed Research and Development (LDRD) program at the Department of Energy's (DOE's) national laboratories, as well as analogous programs at the Department's plants and at the Nevada Test Site, are Congressionally authorized programs designed to build capability to maintain the vitality of these nationally important institutions. This document fulfills all Congressionally requested LDRD program reporting requirements.

Overall, the national laboratories included in this report devoted approximately $515 million to LDRD, addressing topics that span the entire range of DOE's broad scientific mandate. In addition, the production plants invested approximately $25 million through the Plant Directed Research and Development (PDRD) program to fund science and technology projects with the potential to enhance the plants' mission-related manufacturing capabilities, operations, and core technical competencies. Also, the Nevada Test Site invested approximately $5 million through its Site Directed Research and Development (SDRD) Program. Table 1 provides a breakdown of the three elements.

Table 1. LDRD, PDRD and SDRD Breakdown

FY 2009	LDRD	PDRD	SDRD	Total
# of Projects	1,663	153	42	1,858
$ Value of Projects Reported*	$511.4M	$23.8M	$4.4M	$539.6M

*These numbers do not reflect program administrative costs. LDRD administrative costs are approximately $4.4M. PDRD and SDRD administrative costs are approximately $1.6M and $.6M respectively.

Based on the analysis and review (discussed in Section 2.1.3 of this report) of total FY 2009 LDRD funding of $515 million, $341 million of FY 2009 LDRD investments were made in projects expected to benefit the defense and national security missions. In addition, FY 2009 investments totaling $454 million were made in projects expected to benefit non-defense customer mission areas, and $153 million in projects expected to benefit Department of Homeland Security (DHS) programs.

In response to the fiscal year (FY) 2002 Energy and Water Development Appropriations Conference Report, the Secretary issued guidance requiring all LDRD laboratories to notify other Federal agencies concerning LDRD charges. With the creation of the DHS, there are additional provisions for the notification of LDRD charges, as well as requirements for acknowledgements regarding the benefits of LDRD, prior to final approval of all DHS projects (see Section 2.3). Collectively these policies provide the basis for the Secretary's affirmation that all FY 2009 LDRD activities derived from funds of other Federal agencies have been conducted in a manner that supports the science and technology development that benefits the programs of the sponsoring agencies and are consistent with the appropriations acts providing funds to those agencies. That requested affirmation is included in Section 2.4 of the report.

An important component of the LDRD program's contribution to the laboratories' future is its ability to attract promising young scientists and engineers to the institutions. LDRD-funded post-doctoral appointments, for example, supported about 35 percent of all post-doctoral scientists and engineers at the reporting national laboratories in FY 2009. In addition, graduate students participate in some LDRD projects, and the LDRD program provides a mechanism for scientists and engineers at the laboratories to keep themselves current in their fields.

The Department has concluded that the LDRD program helps to maintain the vitality of the laboratories that support the Department's missions and national needs. We have and will continue to carefully review the management and administrative procedures and funding levels at each of the relevant laboratories.

1. Introduction

1.1 Background

Pursuant to statutory authorizations, the DOE national laboratories, manufacturing plants, and the Nevada Test Site (NTS), operate research and development programs using a portion of their overall budgets for the purpose of investing in future capabilities. This report covers these programs and activities for FY 2009.

LDRD, the first of these programs, was implemented at the DOE national laboratories to formalize what had been a long-standing practice, authorized by legislation, to use a percentage of the laboratory's total budget for critical research and development efforts that the laboratory determined to be important.

Within the overall context of maintaining the vitality of the laboratories, the specific purpose of the LDRD program is to provide the DOE laboratories with the opportunity and flexibility to undertake overhead-funded research and development activities to:

(1) pursue new and innovative scientific and technological ideas;
(2) enhance the scientific and technological vitality of the institution;
(3) manage strategic direction; and
(4) develop and retain new workforce capabilities.

DOE policy provides guidance to ensure effective management and oversight of the LDRD program while supporting the laboratories' abilities to pursue innovative self-selected projects with the concurrence of the DOE/NNSA. The process is consistent with DOE's management philosophy for all research and development activities, and it includes annual planning and reporting documents as well as program and peer reviews.

1.2 Purpose of the Report

Formally, this report responds to the Conference Report (H.R. Report No. 106-988) accompanying the Energy and Water Development Appropriations Act, 2001, which requested DOE's Chief Financial Officer "to develop and execute a financial accounting report of LDRD expenditures by laboratory and weapons production plant." It also responds to the Conference Report (H.R. Report No. 107-258) accompanying the Energy and Water Development Appropriations Act, 2002, which requested the Secretary of Energy to include in the annual report to Congress an affirmation that all LDRD activities derived from funds of other agencies have been conducted in a manner that supports science and technology development that benefits the programs of the sponsoring agencies and is consistent with the appropriation acts that provided funds to those agencies. Such an affirmation is included in Section 2.4 of this report.

Further, this report addresses Section 3136(b) (1) of the National Defense Authorization Act for Fiscal Year 1997 (Public Law 104-201), which requires submission each year of "a report on the funds expended during the preceding fiscal year on activities under [the LDRD Program] to permit an assessment of the extent to which such activities support the national security mission of the Department of Energy." Based on the analysis and review (discussed in Section 2.1.3 of this report) of total FY 2009 LDRD funding of $515 million, $341 million of FY 2009 LDRD investments were made in projects expected to benefit the defense and national security missions.

This report addresses what research and development activities the funding supports, and why the program is important to DOE and the laboratories. The national laboratories organize their respective programs according to their individual needs; however, the LDRD program does have a common administrative approach consistent with the statutory authorizations and Departmental guidelines.

This report describes the LDRD program and its implementation at the various DOE national laboratories and also includes newer, analogous programs implemented at manufacturing plants and the Nevada Test Site as summarized in Sections 3.1 and 3.2 of this report. They are authorized under separate legislation. The Plant Directed Research, Development and Demonstration (PDRD) Site-Programs are consistent with the statutory authorizations found as stated in section 310 of the Energy and Water Development

Appropriations Act, 2001 (Public Law 106-377) and section 3156 of the Floyd D. Spence National Defense Authorization Act for Fiscal Year 2001 (Public Law 106-398) at the following sites:

- The Kansas City Plant, Kansas City, Missouri;
- The Y-12 Plant, Oak Ridge, Tennessee;
- The Pantex Plant, Amarillo, Texas; and
- The Savannah River Plant, Aiken, South Carolina.

The Site Directed Research, Development and Demonstration (SDRD) program is consistent with the statutory authorizations found in Section 310 of Energy and Water Development Appropriations Act, 2002 (Public Law 107-66), which authorizes a program for directed research and development at the NTS.

Section 311 of the Energy and Water Development Appropriations Act, 2006 (Public Law 109-103) raised the maximum LDRD funding level to 8 percent and the PDRD and SDRD funding level to 3 percent and made all the DOE labs eligible for LDRD funding. It also applied overhead costs to LDRD, PDRD, and SDRD.

In FY 2007, the Savannah River National Laboratory, the National Renewable Energy Laboratory, and the Princeton Plasma Physics Laboratory initiated LDRD programs based on this legislation. Subsequently, section 309 of Division C of the Consolidated Appropriations Act, 2008 (Public Law 110-161) raised the maximum PDRD and SDRD funding levels to 4 percent. Section 308 of Division C of the Omnibus Appropriations Act, 2009 (Public Law 111-8) restated the same 8 percent and 4 percent ceilings for FY 2009. FY 2009 was the first year SLAC National Accelerator Laboratory participated in the LDRD program.

2. FY 2009 LDRD Program

2.1 Financial Information

2.1.1 LDRD Funding Mechanism

The LDRD program is structured to pursue innovative and creative science and technology, often with an emphasis on projects that will contribute to the needs of multiple programs and Federal agencies. The Department views LDRD as a legitimate cost of doing business for all sponsors at the laboratories and all sponsors are charged the same rate for LDRD at the laboratory. Therefore, to ensure that all users of the laboratories support their fair share of LDRD, the costs are funded as part of laboratory indirect costs, up to a maximum of 8 percent of operating and capital equipment costs, and are treated as normal costs of doing business. As such, all organizations that fund programs at laboratories also fund LDRD activities. The capabilities developed and maintained through LDRD, in turn, may benefit all laboratory customers. This combination of equitable treatment of laboratory sponsors and multiple benefits derived from LDRD is achievable through the indirect cost funding mechanism for LDRD.

The pricing policy of DOE is full cost, which includes all direct costs incurred in performing the work, any other allocable costs incurred by the laboratory in performing the work, and a Federal administrative charge of 3 percent, as appropriate, of these costs for non-DOE sponsors. LDRD charges and assessments on Work for Others (WFO) agreements are discussed in more detail in Section 2.3. LDRD is considered an allocable cost in accordance with the terms of the laboratory management and operating contracts and is identified in the laboratory accounting systems. As stated above, LDRD charges are currently treated as indirect costs. As such, they are allocated and reported in the cost of a laboratory's programmatic work (for both DOE programs and Work for Others).

2.1.2 FY 2009 Expenditures

For FY 2009, the national laboratories devoted approximately $515 million to LDRD. Table 2 shows the LDRD costs by site for FY 2009. For more details on the individual projects at each site, see Appendix 2.

Table 2. FY 2009 Overall Laboratory Costs and LDRD Costs at DOE Laboratories.

Laboratory	# of LDRD Projects	LDRD Costs[1] ($M)	Total Laboratory Costs[2] ($M)	LDRD as a % of Total Cost[3]
Argonne National Lab	118	26.6	566.3	4.70%
Brookhaven National Lab	57	11.7	480.1	2.44%
Idaho National Lab	100	24.9	869.3	2.86%
Lawrence Berkeley National Lab	92	19.6	606.7	3.23%
Lawrence Livermore National Lab	169	85.1	1,476.9	5.76%
Los Alamos National Lab	268	125.8	1,993.3	6.31%
National Renewable Energy Lab	50	5.8	286.2	2.03%
Oak Ridge National Lab	157	31.4	1,188.2	2.64%
Pacific Northwest National Lab	172	29.4	876.1	3.36%
Princeton Plasma Physics Lab	9	1.1	80.6	1.36%
Sandia National Lab	406	148.0	2,160.1	6.85%
Savannah River National Lab	57	4.6	151.5	3.04%
SLAC National Accelerator Lab	8	1.8	228.1	0.79%
Total	1,663	515.8	10,963.4	4.70%

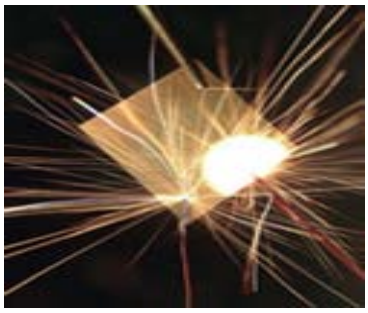
[1] Amounts for Total "LDRD Costs" by laboratory in Table 2 may vary slightly from the total LDRD project costs by laboratory included in Appendix 3 due to the inclusion of LDRD program administrative costs in Table 2 amounts.
[2] Recovery Act costs have been eliminated from Total Laboratory Costs.
[3] Percentage calculations based on unrounded numbers.

2.1.3 FY 2009 LDRD Allocation Percentages

Section 308 of Division C of the Omnibus Appropriations Act, 2009 (Public Law 111-8) provides that the maximum funding level established for LDRD must not exceed 8 percent of the laboratory's total operating and capital equipment budgets, including non-DOE funded work, for the year. It is important to note that individual LDRD program estimates at each site are approved based on laboratory estimated budgets for the fiscal year. Initial planning bases are derived from funds anticipated. The final percentage calculation is based on actual LDRD costs and actual operating and capital equipment costs. Table 2 above includes the FY 2009 end-of-year information.

In addition, an analysis of the FY 2009 LDRD program was conducted as it relates to funding received from both defense and non-defense sources (including DOE and WFO sponsors) and the benefits from the dollars invested by those sources in the LDRD program. This analysis also includes data related to the DHS.

The total FY 2009 funding for the LDRD program conducted at the laboratories was approximately $515 million, which represents almost 5 percent of total laboratory costs at these laboratories. Of this amount, $330 million was provided by defense customers, $165 million by non-defense customers, and $20 million by DHS. A review of the LDRD program funding shows about $341 million supports projects that will be expected to benefit the defense and national security missions, $454 million supports projects that will be expected to benefit nondefense customer mission areas, and $153 million supports projects that will be expected to benefit DHS programs.



Atomically Engineered Composites, LLNL

This review was based on an assessment of each LDRD project in relation to the likely missions that will be expected to benefit. In assessing the return on the dollars invested in LDRD, it is essential to understand that the vast majority of research and development activities have application to national needs in defense, non-defense and DHS missions. That is, as the numbers above indicate, many of the LDRD projects are put in more than one category since they support fundamental research and can be expected to benefit defense, non-defense and DHS missions. This leveraging of the research capabilities of the DOE's laboratories is one of the great benefits of the LDRD program and its focus on the long-term vitality of the laboratories.

2.2 Workforce Development

Maintaining the vitality of the DOE national laboratories—the overarching theme of the LDRD program—implies a responsibility not only for future-looking research and development but also for the workforce of the future. For the laboratories to be poised to tackle problems confronting DOE and the Nation, they require more than facilities and infrastructure. Scientists and engineers must also be available to implement the capabilities of the laboratories.

Post-doctoral appointments offer the single largest source of new scientific and engineering talent for the DOE laboratories and are therefore deemed to be critical to maintaining institutional vitality. The LDRD program plays a central role in the various post-doctoral programs at all of the laboratories, as shown in Table 3, but especially at the national security laboratories.

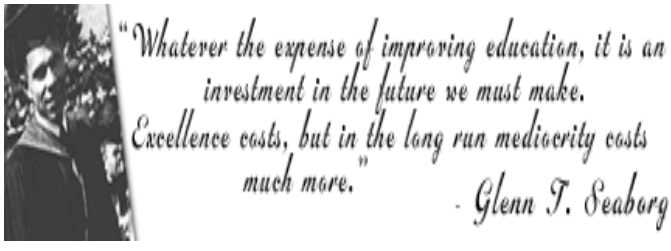


Table 3. Post-Docs supported by LDRD at the DOE Laboratories in FY 2009.

Laboratory	Total Post-Docs	Post-Docs Supported by LDRD	% Supported By LDRD
Argonne National Lab	242	64	26%
Brookhaven National Lab	155	37	24%
Idaho National Lab	20	11	55%
Lawrence Berkeley National Lab	378	57	15%
Lawrence Livermore National Lab	119	97	82%
Los Alamos National Lab	477	305	64%
National Renewable Energy Lab	175	18	10%
Oak Ridge National Lab	430	90	21%
Pacific Northwest National Lab	160	47	29%
Princeton Plasma Physics Lab	10	2	20%
Sandia National Lab	145	111	77%
Savannah River National Lab	13	4	31%
SLAC National Accelerator Lab	93	4	4%
Total	2,417	847	35%

In addition to this formal participation in post-doctoral programs, the LDRD program also supports a wide range of activities that enhance the laboratories workforce development. These include support for both undergraduate and graduate students working on LDRD projects, technical staff retention associated with opportunities to retain and hone scientific skills via LDRD, and a range of university collaborations stimulated via LDRD projects.

2.3 LDRD and the Work for Others Program

One of the features of the DOE national laboratories is the application of science and technology to a broad range of national security and science missions through the DOE WFO program.

All WFO sponsors appear to benefit from the science and technology innovations provided by LDRD. The Department views LDRD as a legitimate cost of doing business for all programs at the laboratories. Therefore, to ensure that all users of the laboratories support their fair share of LDRD innovations, the cost is included as an allocable cost.

WFO programs are possible because the laboratories have developed research and development capabilities in a wide range of areas of relevance to organizations other than DOE. WFO customers seek out these capabilities and, in many cases, initiate WFO research and development at the laboratories. WFO research broadens the base of innovation at the DOE laboratories and increases the number of potential solutions to national challenges, including threats to national security. The laboratories' research results are enhanced by the cross-pollination of technologies developed in conjunction with its WFO partners.

In this regard, Congress provided language in the Conference Report accompanying the Energy and Water Development Appropriations Act, 2002, that requested the Department notify other Federal agencies that a portion of the funds collected through the WFO program will be used to fund LDRD projects. In addition, with the creation of the DHS, Congress enacted analogous requirements that LDRD funding associated with DHS programs be used to support DHS missions. As noted earlier, the Conference Report also requested the Secretary affirm that all LDRD activities derived from funds of other agencies have been conducted in a manner that supports science and technology development that benefits the programs of the sponsoring agencies and is consistent with the appropriations acts that provided funds to those agencies.

In response to the FY 2002 Conference Report, the Secretary issued guidance requiring all LDRD laboratories to notify other Federal agencies concerning LDRD charges prior to funding work at the laboratory. Specifically, each new and/or revised WFO proposal provided to a Federal agency must indicate the amount of LDRD charges that will be collected. Furthermore, the proposal notifies the sponsor that, by providing funding, the agency is acknowledging that LDRD activities are beneficial to their organization and consistent with appropriation acts providing funds to that agency. Subsequently, each WFO funding acceptance document also includes the LDRD estimate acknowledgement.

In February of 2003, the Secretary of Energy and the Secretary of Homeland Security entered into a Memorandum of Agreement to implement key provisions of the Homeland Security Act. In addition, the Deputy Secretary of Energy issued a DOE Notice on *Reimbursable Work for the Department of Homeland Security.* The purpose of that document was to provide information on the process by which the DHS may place orders for reimbursable work activities to be performed at the DOE laboratories. Within that Notice, there are provisions for the notification of LDRD charges in the cost proposal as well as requirements for acknowledgements regarding the benefits of LDRD prior to final approval. On August 17, 2006, the Secretary of Energy issued DOE Order 484.1 to update the DOE Notice.

These policies have been implemented and provide a basis for the Secretary's affirmation to affirm that the LDRD program is managed in accordance with the Congressional requests cited above. In December of 2003, the DOE Acting Chief Financial Officer transmitted applicable guidance and policy to reiterate the process to other Federal agency Chief Financial Officers who are customers and sponsors of work at the Department's laboratories.

2.4 FY 2009 Secretarial Affirmation

Secretarial Affirmation on LDRD

The Conference Report accompanying the Energy and Water Development Appropriations Act, 2002, requests the Secretary of Energy to include in the annual report to Congress for all Laboratory Directed Research and Development (LDRD) activities the affirmation included below. In response to and as support for the annual affirmation, the Department revised its procedures for handling LDRD program charges on other Federal agency funded Work for Others projects in fiscal year 2002. These procedures changed the Work for Others process to ensure appropriate notification of other Federal agencies as to the LDRD charges prior to funding work at the laboratory. Specifically, each new and/or revised Work for Others proposal provided to a Federal agency must indicate the amount of LDRD charges that will be collected. Furthermore, the proposal notifies the sponsor that, by providing funding, the agency is acknowledging LDRD activities are beneficial to its organization and consistent with appropriation acts providing funds to that agency. Subsequently, each Work for Others funding acceptance document also includes the LDRD estimate acknowledgement.

Based on the information and acknowledgments provided to the Department of Energy and its contractors by other Federal agencies funding LDRD activities at DOE facilities, I affirm that all LDRD activities derived from funds of other Federal agencies have been conducted in a manner that supports science and technology development that benefits the programs of the sponsoring agencies and is consistent with the appropriations acts that provided funds to those agencies.

Steven Chu
April 30, 2010

3. *FY 2009 PDRD and SDRD Programs*

3.1 Plant Directed Research and Development- FY Expenditures

Section 308 of Division C of the Omnibus Appropriations Act, 2009 (Public Law 111-8) enabled the Secretary of Energy to authorize an amount not to exceed four percent for PDRD. The following table shows FY 2009 PDRD expenditures by site. It should be noted that the table includes all PDRD costs including individual project costs listed in Appendix 3 and any administrative costs not specifically assigned to individual FY 2009 projects, if applicable.

Plant	# of PDRD Projects	PDRD Costs[1] ($M)	Total Plant Cost ($M)	PDRD as a % of Total Cost[2]
Kansas City	43	5.9	505.0	1.17%
Pantex	15	1.6	654.8	.25%
Sav. River	12	.2	139.0	.11%
Y-12	83	17.7	641.2	2.76%
Total	153	25.4	1,940.0	1.31%

3.2 Site Directed Research and Development-FY Expenditures

Section 308 of Division C of the Omnibus Appropriations Act, 2009 (Public Law 111-8) enabled the Secretary of Energy to authorize an amount not to exceed four percent for SDRD. The following table shows FY 2009 SDRD program expenditures and includes all SDRD costs including individual project costs listed in Appendix 2 and any administrative costs not specifically assigned to individual FY 2009 projects.

Site	# of SDRD Projects	SDRD Costs[1] ($M)	Total Site Cost $M)	SDRD as a % of TotalCost[2]
Nevada Test Site	42	5.0	292.1	1.73%

[1] Amounts for Total "PDRD/SDRD Costs" may vary slightly from the total PDRD/SDRD project costs by site included in Appendix 2 due to the inclusion of PDRD/SDRD program administrative costs.

[2] Percentage calculations based on unrounded numbers.

4. Report Conclusions

The DOE LDRD program offers a flexible mechanism by which the national laboratories maintain their vitality and, in the process, prepare themselves to help address the Nation's future scientific and engineering challenges. In FY 2009, the national laboratories devoted approximately $515 million to LDRD. LDRD projects address topics that span the entire range of DOE's mission areas.

In addition, the production plants invested approximately $25 million through the PDRD program to fund projects that emphasized science and technology with the potential to enhance the plants' mission-related manufacturing capabilities, operations, and core technical competencies and the Nevada Test Site invested approximately $5 million through the SDRD Program.

Based on the analysis and review (discussed in Section 2.1.3 of this report) of total FY 2009 LDRD funding of $515 million, $341 million of FY 2009 LDRD investments were made in projects expected to benefit the defense and national security missions. In addition, FY 2009 investments totaling $454 million were made in projects expected to benefit non-defense customer mission areas, and $153 million in projects expected to benefit DHS programs. The Department also affirms that all FY 2009 LDRD activities derived from funds of other Federal agencies have been conducted in a manner that supports science and technology development that benefits the programs of the sponsoring agencies and is consistent with the appropriations acts providing funds to those agencies.

An important component of the contribution of the program to the laboratories' future is their ability to attract promising young scientists and engineers to the institutions. LDRD funded post-doctoral appointments, for example, supported about 35 percent of all post-doctoral scientists and engineers at the national laboratories in FY 2009. In addition, many graduate students participate in LDRD projects, and the programs provide a mechanism for scientists and engineers at the laboratories to keep themselves current in their fields.

The flexibility inherent in the LDRD program is essential to maintaining the vitality of the laboratories that carry out the Department's missions and national needs. We have carefully reviewed the management and administrative procedures governing the program and monitor LDRD funding levels at each of the laboratories. This oversight is integral to maintaining a strong, credible and effective LDRD program.

Appendix 1

The following requirements, requests and other statutory and report language were referenced in this report:

Section 3136(b)(1) of the National Defense Authorization Act for Fiscal Year 1997 (Public Law 104-201)

"The Secretary of Energy shall annually submit to the congressional defense committees a report on the funds expended during the preceding fiscal year on activities under the Department of Energy Laboratory Directed Research and Development Program. The purpose of the report is to permit an assessment of the extent to which such activities support the national security mission of the Department of Energy."

106th Congress - House of Representatives Conference Report 106-988

"The conference agreement includes an allowance of six percent for the laboratory directed research and development (LDRD) program and two percent for nuclear weapons production plants. Travel costs for LDRD are exempt from the contractor travel ceiling. The conferees direct the Department's Chief Financial Officer to develop and execute a financial accounting report of LDRD expenditures by laboratory and weapons production plant. This report due to the House and Senate Committees on Appropriations by December 31, 2000, and each year thereafter, should provide costs by personnel salaries, equipment, and travel.[4] The Department should work with the Committees on the specific information to be included in the report. "

107th Congress - House of Representatives Conference Report 107-258

"The conference agreement does not include bill language proposed by either the House or the Senate regarding the Laboratory Directed Research and Development (LDRD) program. The conferees recognize the benefits of LDRD and expect LDRD activities to continue at previously authorized levels. However, when accepting funds from another federal agency that will be used for LDRD activities, the Department of Energy shall notify that agency in writing how much will be used for LDRD activities. In addition, the conferees direct the Secretary of Energy to include in the annual report to Congress on all LDRD activities an affirmation that all LDRD activities derived from funds of other agencies have been conducted in a manner that supports science and technology development that benefits the programs of the sponsoring agencies and is consistent with the Appropriations Acts that provided funds to those agencies."

108th Congress - House of Representatives 108-212

"The Committee recognizes the value of conducting discretionary research at DOE's national laboratories. Such research provides valuable benefits to the Department and to other Federal agencies, and is crucial to attracting and retaining scientific talent at the laboratories. However, the Committee continues to have concerns about the financial execution of this program. One concern centers on the manner in which DOE levies the LDRD ''tax'' on all DOE and Work for Other programs, and then accumulates the funds into an overhead pool. This Committee typically deals with defense and non-defense allocations within the Energy and Water Development bill, and the line between those two allocations is not easily crossed. Under LDRD, however, the laboratory directors are able to pool defense and non-defense appropriations at will. The only obvious solution to this concern is to require DOE to establish and track separate LDRD accounts for defense and non-defense funding sources, and the Committee is not yet ready to direct that change.

The other principal concern deals with the application of LDRD to work being performed for other agencies (Work for Others). The conference report accompanying the Energy and Water Development Appropriations Act, 2002 (P.L. 107–66) directed the Secretary to ''include in the annual report to Congress on LDRD activities an affirmation that all LDRD activities derived from funds of other agencies have been conducted in a manner that support science and technology development that benefits the programs of the sponsoring agencies and is consistent with the Appropriations Acts that provided funds to those agencies.'' The Department has implemented this guidance by including the following language into its standard project proposal and funding acceptance documents that it requires the funding WFO agencies to sign: ''The Department of Energy believes that LDRD efforts provide opportunities in research that are instrumental in maintaining cutting edge science capabilities that benefit all of the customers at the laboratory. The Department will conclude that by providing funds to DOE to perform work, you acknowledge that such activities are beneficial to your organization and consistent with appropriations acts that provide funds to you.'' This is too facile a solution for the Department. According to a review conducted by this Committee's investigative staff, only a little

[4]The offer to streamline the LDRD report resulted in the Department and Hill contacts agreeing not to require costs be provided by personnel salaries, equipment and travel.

more than half of the WFO customers indicated they could reliably certify that DOE's LDRD activities are consistent with the funding agencies' appropriations acts. Nevertheless, most agencies sign the required certification letter to DOE because they see no real alternative. The Committee fully expects that there are terms and conditions attached to the appropriations acts for these other agencies that are being ignored through this so-called ''certification'' process for LDRD work."

The Committee is considering changing the arrangement by which LDRD activities are funded to eliminate these concerns. The results of an ongoing General Accounting Office review will help to inform the Committee's choice. The Committee is receptive to streamlining the annual LDRD report to Congress, which is undoubtedly a significant burden for the Department to prepare and is of little value to this Committee in resolving the concerns identified above. The Department should work with Committee staff to develop a simpler and more useful LDRD report."

Section 311 of the Energy and Water Development Appropriations Act, 2006 (Public Law 109-103)

"Of the funds made available by the Department of Energy for activities at government-owned, contractor-operator operated laboratories funded in this Act or subsequent Energy and Water Development Appropriations Acts, the Secretary may authorize a specific amount, not to exceed 8 percent of such funds, to be used by such laboratories for laboratory-directed research and development: *Provided,* That the Secretary may also authorize a specific amount not to exceed 3 percent of such funds, to be used by the plant manager of a covered nuclear weapons production plant or the manager of the Nevada Site Office for plant or site-directed research and development: *Provided further,* That notwithstanding Department of Energy order 413.2A, dated January 8, 2001, beginning in fiscal year 2006 and thereafter, all DOE laboratories may be eligible for laboratory directed research and development funding."

109th Congress - House of Representatives Conference Report 109-275

"The conferees are concerned with the level of overhead charges applied to programs funded in this bill and urge the Department to continue to work to minimize the overhead burden on all program activities. In order to ensure an equitable allocation of overhead costs the Secretary should apply overhead charges to LDRD activities consistent with cost accounting practices applied to program activities that are direct funded. The conference agreement increases the allowable percentage for LDRD, PDRD and SDRD activities to allow this accounting change without harming the underlying discretionary research activities. The change in accounting practices should be implemented with no net reduction in LDRD levels below 6 percent of the funds provided by the Department of Energy to such labs for national security activities and 2 percent for PDRD and SDRD activities at the appropriate plants and sites. Within 90 days after the date of enactment of this Act, the Secretary of Energy shall submit a report to the Committees on Appropriations detailing how the accounting change will be implemented without impacting the basic research and the change shall be implemented within 180 days of enactment."

Section 309 of Division C of the Consolidated Appropriations Act, 2008 (Public Law 110-161)

"LABORATORY DIRECTED RESEARCH AND DEVELOPMENT. Of the funds made available by the Department of Energy for activities at government-owned, contractor-operator operated laboratories funded in this Act or subsequent Energy and Water Development Appropriations Acts, the Secretary may authorize a specific amount, not to exceed 8 percent of such funds, to be used by such laboratories for laboratory-directed research and development: *Provided,* That the Secretary may also authorize a specific amount not to exceed 4 percent of such funds, to be used by the plant manager of a covered nuclear weapons production plant or the manager of the Nevada Site Office for plant or site-directed research and development: *Provided further,* That notwithstanding Department of Energy order 413.2A, dated January 8, 2001, beginning in fiscal year 2006 and thereafter, all DOE laboratories may be eligible for laboratory directed research and development funding."

Appendix 2

Listing Of FY 2009 LDRD, PDRD & SDRD Projects

Some projects contain zero or negative dollars. For those projects with a Fiscal Year Total of $0, a number of explanations are possible. Examples of situations that could lead to a $0 Fiscal Year Total include the following:

1. the project was approved, but not funded due to the need to fund higher priority projects,
2. the primary investigator was reassigned,
3. the primary investigator accepted another position external to the laboratory, or
4. the required equipment/facilities were not available.

Likewise, there are a number of possible explanations for a particular project to have a negative Fiscal Year Total. One possible explanation would be due to cost corrections to inactive projects from previous Fiscal Years to incorporate accrual adjustments or adjustments for finalized overhead rates.

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ANL - Argonne National Lab

Project ID	Project Name	FY Total
P/ANL2006-268	Novel Hybrid Nanomaterials via Uniting Top-Down and Bottom-Up Assembly Methods	$80,300
P/ANL2007-007	Enzymes for Cellulosic Ethanol Production: Structure-Function Studies	$216,200
P/ANL2007-008	Astrochemical Studies of the Origins of Life using Circularly Polarized Synchrotron Radiation	$135,000
P/ANL2007-027	Whole Cell-Based Biosensors and Bioelectronics	$150,100
P/ANL2007-044	Aligned Carbon Nanotube as Pt-Free Electrode Catalyst for Fuel Cell	$149,600
P/ANL2007-059	Development of In Situ Non-Resonant X-Ray Scattering Technique and Its Application to Redox Reactions in Battery Materials	$104,300
P/ANL2007-060	Microporous Filters for Hydrogen Purification	$200,400
P/ANL2007-066	Mesoscale Simulation of Bloodflow using Kinetic Theory	$98,400
P/ANL2007-068	Sub-Millisecond Measurements of Structural Changes in Materials under Extreme Conditions	$135,300
P/ANL2007-071	Design and Synthesis of New Nanocarbon Composites from Carbon Nanotubes and Ultrananocrystalline Diamond	$187,600
P/ANL2007-075	Magnetically Targeted Thermal Tumor Therapy using Designer Nanospheres	$238,400
P/ANL2007-080	Identification and Characterization of Ovarian Cancer Stem Cells Towards Ultimate Cancer Treatment	$98,200
P/ANL2007-088	Solar Thermoelectric Energy Conversion in Nanocomposites	$105,500
P/ANL2007-100	Transition Edge Sensors (TES)	$600,100
P/ANL2007-105	Development of Concepts for a Super Separator-Spectrometer	$157,200
P/ANL2007-107	Development of Unique Environmental Basic Research Capabilities for Sustainable Bioenergy Research	$99,300
P/ANL2007-110	Membrane Analysis and Simulation System (MASS)	$299,200
P/ANL2007-113	Standoff Monitoring of Acoustic Signatures by MMW Modulated Scattering Technique	$74,900
P/ANL2007-133	An Ultra-Sensitive Detection Assay Based on DNA-Modulated Enzymatic Visualization	$97,800
P/ANL2007-142	Second-Sound Diagnostic Thermometry for ILC Cavities	$54,400
P/ANL2007-150	Metal and Semiconductor Nanoparticle Assemblies: Controlled Quantum Coupling on the Nanometer Scale	$98,200
P/ANL2007-157	Molecular Machines: The Visualization of Motions	$113,000
P/ANL2007-158	An Integrated X-Ray/Neutron Approach to Magnetic Depth Profiling in Artificial Nanostructures	$61,400

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ANL - Argonne National Lab

Project ID	Project Name	FY Total
P/ANL2007-161	Systems Biology for Enhanced Bioconversions	$461,500
P/ANL2007-162	Metagenomics and Discovery for Biofuels	$387,900
P/ANL2007-164	A Framework for Scalable Statistical Genomics	$102,700
P/ANL2007-165	Real-Time Analysis of Advanced Photon Source Data	$198,500
P/ANL2007-166	Analysis Services for Petascale Computing	$211,600
P/ANL2007-180	Simulations and Hardware Development for Astrophysics	$128,900
P/ANL2007-186	Solid State Chemistry for Advanced Thermoelectric Materials	$500,900
P/ANL2007-189	Multidisciplinary Theory Investigations	$577,900
P/ANL2008-003	Hybrid Block Copolymer-Nanocrystal Material for Efficient Photovoltaics	$116,300
P/ANL2008-008	Automated Theoretical Chemical Kinetics	$139,200
P/ANL2008-009	Superslick Anti-Fog Transparent Coating for Bronchoscope	$177,200
P/ANL2008-020	A Cell-Free Approach Towards Membrane Protein Production	$155,000
P/ANL2008-026	The Use of the Hedvall Effect to Control Catalytic Properties of Sub-Nanometer Size Magnetic Clusters	$152,800
P/ANL2008-027	Optimal Active Thermochemical Tables	$199,300
P/ANL2008-035	Rapid XRF Elemental Imaging for High-Throughput Identification of Metal-binding Proteins Critical to Life, Disease and Bioremediation	$190,100
P/ANL2008-036	Systematic Analysis of the Role of Zinc in Stem Cell Plasticity and Pluripotency	$225,100
P/ANL2008-070	Complex Dynamic Behavior Investigated with Real-Time X-Ray Photon Correlation Spectroscopy	$103,000
P/ANL2008-071	Development of a Total Absorption Spectrometer for Advanced Fuel Cycle Applications	$137,600
P/ANL2008-090	Selective, Efficient C-H Bond Activation of Alkanes by High Surface Area, Size Selected Noble Metal Clusters	$125,400
P/ANL2008-118	Innovations in Advanced Simulation and Experimental Validation for Nuclear Energy Applications	$504,400
P/ANL2008-119	Risk-Based Decision System toward Risk Excellence	$80,500
P/ANL2008-120	Identification of Infectious and Toxin Threat Agents within 15 Minutes	$101,300
P/ANL2008-121	Characterization of Ignition, Combustion, and Emissions for Advanced Engines and Fuels	$699,800
P/ANL2008-122	Plasmonics-Based Methods for Fast, Selective Chemical Biological, and Explosives Detection	$250,400

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ANL - Argonne National Lab

Project ID	Project Name	FY Total
P/ANL2008-124	Stabilization of Subsurface Contaminants through Augmentation of Natural Biological and Geochemical Processes	$243,700
P/ANL2008-128	Wide-Angle X-Ray Scattering as a Probe of Protein Structure, Dynamics and Function	$271,900
P/ANL2008-130	Study of the Fundamental Properties of Buoyantly-Driven Turbulent Nuclear Burning in the Context of Type Ia Supernovae	$109,600
P/ANL2008-135	Integrating Radiatively Important Aerosols into a New ANL Socioeconomic/Gloval Change Modeling Framework	$66,600
P/ANL2008-136	Beam Dynamics for an ERL Upgrade of the APS	$145,700
P/ANL2008-138	A Global Modeling Initiative for National Security Event Dynamics	$149,400
P/ANL2008-140	Microbial Basis for Soil-Inorganic Carbon Sequestation	$524,100
P/ANL2008-141	Development of the Emittance Exchange Technique for Improved Accelerator Facility Performance	$200,000
P/ANL2008-142	Exascale Agent-Based Modeling System	$219,700
P/ANL2008-146	Oxidative Decomposition of Cellulosic Materials	$600,200
P/ANL2008-147	Nuclear Astrophysics	$259,900
P/ANL2008-150	Advanced Simulation of Separations	$376,500
P/ANL2008-152	Design and Fabrication of a Model HOM-Suppressed High Beam Power CW Superconducting RF Structure and a High Performance Cryomodule for Light Source Energy Recovery Linacs	$91,900
P/ANL2008-154	Exascale Hardware Designs	$601,200
P/ANL2008-156	An X-Ray Free-Electron Laser Oscillator in an Energy Recovery Linac	$410,500
P/ANL2008-157	Science and Technology for Development of High-Sensitivity Biosensors	$99,300
P/ANL2008-159	Very High Energy Gamma-Rays: Present and Future	$319,500
P/ANL2008-160	End-to-End Biofuels Analysis: Building Capability in HPC Socio-Economic-Environmental Modeling	$751,400
P/ANL2008-161	Ultrafast X-Ray Tracking of Laser-Controlled Molecular Motions	$474,200
P/ANL2008-166	Mapping Protein Binding Domain and Small Molecule Interactions	$98,500
P/ANL2008-171	Coherent Diffraction Imaging of Nonperiodic Materials	$479,900
P/ANL2008-172	The Next Generation of Fuel Cell Electrocatalysts: An Integrated Experiment/Theory Approach to Structure-Property-Function Relationships in Electrocatalysis	$316,400
P/ANL2008-177	High Brightness CW Injector Technology and Design Studies for the Energy Recovery Linac	$151,000

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ANL - Argonne National Lab

Project ID	Project Name	FY Total
P/ANL2008-178	Development of Nanofabricated Superconducting RF for Improved SRF Performance	$217,100
P/ANL2008-179	Software Infrastructure to Enable Exascale Computational Science	$551,700
P/ANL2008-183	Novel Concepts in Streak-Camera Development and Applications	$157,000
P/ANL2008-188	Solar and Astrophysical MHD	$204,900
P/ANL2008-190	Feasibility Studies and Pre-Conceptual Design of Continuous Wave (CW) Superconducting RF Deflecting Cavities for the Generation of Short X-ray Pulses at the Advanced Photon Source	$180,000
P/ANL2008-191	Inducement of Targeted Organ-Protective Cooling Using Ice Slurry Coolants	$498,600
P/ANL2008-192	Smart polymers as molecular therapeutics and sensing agents	$154,300
P/ANL2008-193	X-ray Studies of Catalysis	$853,400
P/ANL2008-195	NEMS Based Nano-sensors for Basic Science Research	$192,200
P/ANL2009-014	Integrating Suicide Attack Information with Radiological Material Loss Data in the Context of WMD Threat Evaluation	$78,000
P/ANL2009-017	Rapid Elemental and Isotopic Analysis of Trace Actinides and Fission Products in Fused Materials Using Advanced Extraction Methods and Resonant Ionization Mass Spectrometry (RIMS)	$99,300
P/ANL2009-028	Tagging & Monitoring Sealed Radiological Sources	$150,200
P/ANL2009-035	Explosive Nucleosynthesis of Heavy Elements	$251,800
P/ANL2009-037	The Development of Neutron Skins	$112,200
P/ANL2009-047	Novel Computing Methodologies for the Simulation of Complex Molecular Systems	$194,200
P/ANL2009-050	Catalyst Station at APS Beamline 9-BM	$407,800
P/ANL2009-059	Photoacoustic Technique for Remote Detection of Special Nuclear Materials	$70,700
P/ANL2009-062	Next Generation Sequencing Technology Applied to Genome Annotation	$165,400
P/ANL2009-068	Coherent Diffraction Imaging of Complex Polymeric Networks	$154,900
P/ANL2009-070	Characterization of Proteins from Anaeromyxobacter Dehalogenans, A Newly Identified Bacterium of Metabolic and Respiratory Versatility Important for Bioremediation	$199,000
P/ANL2009-071	Large Scale Beam Dynamics Optimization for More Efficient Operation of Large User Facilities	$180,000
P/ANL2009-076	Photocathodes Development for Accelerator R&D	$173,900
P/ANL2009-080	Improving Charged Particle Optical Device Designs: From Realistic 3D Field Maps to Transfer Maps	$99,200

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ANL - Argonne National Lab

Project ID	Project Name	FY Total
P/ANL2009-083	Local Probes of Naovel Electronic States at Complex Oxide Interfaces	$112,200
P/ANL2009-085	Concept of Ultra-low Emittance Injector for Future X-Ray FEL Oscillator	$220,400
P/ANL2009-091	Solvent Extraction of Colloidal Aluminum Oxide Applicable to High-Level Radioactive Wastes	$119,600
P/ANL2009-097	Integrated Biofuel/Engine Design	$598,500
P/ANL2009-111	Three-Dimensional Metamaterials with Negative Refractive Index	$100,500
P/ANL2009-115	Advanced Cathode Materials for high Performance Lithium Ion Batteries	$234,100
P/ANL2009-117	Fusion Cell Nucleus	$245,100
P/ANL2009-138	Ultra-Sensitive Protein Biomarker Screening Assay for Early Stage Disease Diagnosis	$153,700
P/ANL2009-146	Laboratory Simulations of Plasma Conditions Near Active Galactic Nuclei and Black Holes	$119,700
P/ANL2009-155	New Framework for Electromagnetic Simulations on Exascale Supercomputers	$221,400
P/ANL2009-156	Metagenomics-enabled Discovery of Protein Function	$173,600
P/ANL2009-158	Advances in 2 Kelvin Superconducting Cavitites for Future Accelerators	$243,400
P/ANL2009-171	Combinatorial Deletions to Produce a Minimal Strain of Bacillus Subtilis	$132,100
P/ANL2009-176	A Systems-wide Assessment of Carbon Economy in Midwest Soils: Agricultural versus Prairie	$316,700
P/ANL2009-177	Recovery of Full-length Genes for Expression of Proteins from Metagenomic Sequence Data	$99,600
P/ANL2009-180	Advancing the Frontiers of Computational Design of Materials	$320,400
P/ANL2009-186	Characterization of Microbial Community Dynamics	$165,800
P/ANL2009-190	Single Photon Receiver Using Abrikosov Vortices	$144,400
P/ANL2009-204	Engineering Nanostructures Atom by Atom for Optical Activitiy and Quantum Coherence	$125,600
P/ANL2009-209	Physics of the Superinsulating State	$205,400
P/ANL2009-212	Development of a Novel Instrument for Argon-39 Analysis	$141,400
P/ANL2009-214	Materials Theory	$109,700
P/ANL2009-226	A High-Performance Computational Framework for Structure Determination at Large Scale Facilities	$323,900
P/ANL2009-227	Multiplexed Antibody-Based Biosensors: Unanswered Questions	$99,800
P/ANL2009-228	Exploratory Examination of the Feasibility of Computing Financial ROI for Completed LDRD Projects from Existing Data and Information Sources	$73,700

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ANL - Argonne National Lab

Project ID	Project Name	FY Total

Total # of Projects for ANL:	**118**	**Total Cost for ANL:**	**$26,589,700**

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BNL - Brookhaven National Lab

Project ID	Project Name	FY Total
07-001	QCD Thermodynamics at Non-zero Temperature and Density	$198,910
07-002	Lattice QCD Simulations on BlueGene/L	$48,883
07-004	Proof-of-Principle Laser System for ILC Positron Source	$78,747
07-005	Sensitive Searches for CP-Violation in Hadronic Systems	$86,259
07-006	Feasibility and Design Studies for a Detector for e+p, e+A, p+p, p+A, and A+A Collisions at BNL	$72,170
07-007	A Novel and Compact Muon Telescope Detector for QCD Lab	$83,988
07-010	Design Optimization of a Reactor Neutrino Experiment	$30,867
07-019	Development of Laser beam Shaper for Low Emittance Electron Beams	$50,001
07-023	Surface Engineered and Core-Shell Nanowires: Nanoscale Building Blocks for Third Generation Photovoltaics	$124,477
07-025	Precision Assembly of Nano-Objects – Approaching Artificial Photosynthesis	$89,497
07-027	Photocatalytic Carbon Dioxide Reduction to Methanol using Metal Complexes with an NADH Model Ligand	$90,779
07-030	Structure of Mass-Size Selected Nanoparticles by Scanning Transmission Electron Microscopy	$31,289
07-032	Synthesis of Conjugated Polymers for Fundamental Questions in Solar Energy	$38,931
07-035	Ultra-thin Graphite Analog Compounds	$64,387
07-036	Lipid-Coated Nanoparticles and Their Interactions with Lipid Membrane Surfaces	$99,311
07-038	Angle-Resolved Time-of-Flight Ion Scattering Spectroscopy from MBE-Grown Oxide Thin Films Surfaces	$208,861
07-047	Characterization of Enzymatic O-acylation to Facilitate Biomass and Bioenergy Production	$162,296
07-048	Functional Neurochemistry	$117,908
07-054	Miniaturized RF Coil Arrays for MicroMRI	$24,143
07-059	A Non-Fermentation Route to Convert Biomass to Bioalcohols	$29,386
07-062	Fate and Reactivity of Carbon Nanoparticles (CNPs) Exposed to Aqueous Environmental Conditions	$30,985
07-073	Development of Room-temperature CdMnTe Gamma-ray Detectors	$31,024
07-075	Developing a New Framework for Investigating Earth's Climate and Climate Change	$30,565
07-080	A Novel Approach for Efficient Biofuel Generation	$26,615

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BNL - Brookhaven National Lab

Project ID	Project Name	FY Total
07-084	Investigations of Hygroscopic Growth and Phase Transitions of Atmospheric Particles by Noncontact Atomic Force Microscopy	$132,881
07-089	Chemical Imaging of Living Cells in Real Time	$68,949
07-090	Coherent Bragg Rod Analysis of High-Tc Superconducting Epitaxial Films	$98,763
07-091	Development of a Planar Device Technology for Hyperpure Germanium X-ray Detectors.	$116,876
07-096	Study of Epigenetic Mechanisms in a Model of Depression	$443,690
07-097	Polarized Electron SRF Gun	$49,488
07-101	High End Scientific Computing	$782,209
08-001	How Does Color Flow in a Large Nucleus: Exploring the Chromo-Dynamics of QCD through Diffractive and Jet Measurements at eRHIC	$113,328
08-002	Strong Correlated Systems: From Graphene to Quark-Gluon Plasma	$102,673
08-004	Getting to know Your Constituents: Studies of Partonic Matter at the EIC	$83,079
08-005	Development of the Deuteron EDM Proposal	$293,925
08-008	Development of Small Gap Magnets and Vacuum Chamber for eRHIC	$176,703
08-022	Novel Methods for Microcrystal Structure Determination at NSLS and NSLS-II	$115,017
08-025	Combined PET/MRI Multimodality Imaging Probe	$93,961
08-028	Genomic DNA Methylation: The Epigenetic Response of Arabidopsis Thaliana Genome to Long-Term Elevated Atmospheric Temperature and CO2 in Global Warming	$152,408
08-034	Fabry-Perot Interferometer & Hard X-ray Photoemission	$97,361
08-037	Ultrafast Electron Diffraction for Transient Structure and Phase Transition Studies at the NSLS SDL	$192,465
08-039	The Development of a Laser Based Photoemission Facility for Studies of Strongly Correlated Electron Systems	$129,926
08-042	Theory of Electronic Excited States in Heterogeneous Nanosystems	$128,440
08-043	Nanofabrication Methods Using Solution-Phase Nanomaterials	$137,727
08-051	Identification of Organic Aerosols and Their Effects on Radiative Forcing	$166,035
08-060	Computational Climate Science	$176,862
08-062	A Novel Spintronic Room-Temperature High Purity Germanium X- and Gamma-Ray Spectrometer	$153,167
08-080	Tracer Development-Improving PET and MRI Imaging	$1,258,146

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Project List -- Fiscal Year 2009

BNL - Brookhaven National Lab

Project ID	Project Name	FY Total
08-081	Development of MR Research at BNL	$986,690
08-082	Biofuels and Nanotech for Improvement of Oil Heat Combustion Systems	$52,112
08-083	Solar Water Splitting: Quantum Theory of Photocatalytic Processes at the Water/Semiconductor Interface	$53,098
09-001	Nanoscale Electrode Materials for Lithium Batteries	$553,607
09-002	Bioconversion of Lignocelluloses to Ethanol and Butanol Facilitated by Ionic Liquid Preprocessing	$495,999
09-003	Organic Photovoltaics: Nanostructure, Solvent Annealing and Performance	$442,319
09-004	Surface Chemistry and Electrochemistry of Ethanol	$571,154
09-005	Synergistic Interactions Between Poplar and Endophytic Bacteria to Improve Plant Establishment and Feedstock Production on Marginal Soils	$911,041
09-006	Development of Capability to Design State-of-the-Art Microelectronics	$491,189

Total # of Projects for BNL: **57** **Total Cost for BNL:** **$11,671,567**

INL - Idaho National Lab

Project ID	Project Name	FY Total
AE117	Group Actinide Separation from Spent Nuclear Fuel Using a Modified Universal Solvent Extraction Process	$159,834
AE118	Exploration of Electrolyte Complexation and Pulse Deposition for Production of Dense Uranium Rodlets	$50,690
AE119	Multi-reactor design and analysis platform	$190,939
AE121	A General Framework for Simulating Fully-Coupled Mass and Energy Transport Phenomena in Nuclear Energy Systems	$744,230
AE122	SYSTEM ANALYSIS FOR REACTOR APPLICATIONS WITH HIGH FIDELITY	$297,889
AE123	Acquisition and Improvement of a Modern Lattice Physics Capability	$382,616
AE124	Unified Two-phase CFD Modeling of Boiling, Cavitation, and Bubble Collapse	$372,765
AF103	Environmental Effects on Crack Growth in High-Temperature Alloys for Advanced Energy Systems	$186,521
AF104	Development of Advanced Burnup Measurement and Nuclear Forensics using Inductively Coupled Mass Spectroscopy (ICP-MS) Isotopics Analysis Techniques	$477,009
AF105	Development of a Small Sample Volume Mechanical Properties Testing Technique for Irradiated Fuels and Materials	$200,300
AS102	Utility of unusual oxidation states of americium for separations	$190,865
AS105	Rapid detection of plutonium, neptunium and technetium in water samples	$297,920
AS106	Evaluation of Covalent Interactions in Actinide Coordination Compounds	$250,678
AS107	Measuring Actinide Speciation in High pH Solutions	$299,482
AS108	Isotope Ratio Measurements Methods for Direct Analysis of Samples	$249,738
BS103	Multi-Stage Sequential Injection Gas Gun	$190,464
BS104	A strategy to tightly couple neutronics and thermal-hydraulics models for next generation reactor analysis	$135,058
BS105	Thermal and acid activated in planta lignocellulose-degrading system for economically enhanced industrial processes	$150,286
BS106	Novel catalysts for the reduction of biomass pretreatment severity	$149,581
CA104	Microstructural Evolution During Spark Plasma Sintering of High-Temperature Fuels and Coatings	$318,579
CA105	Suitability of Layered Basalt as Targets for Industrial Carbon Dioxide Sequestration	$129,204
CA108	Understanding Apomixis: The Basis for a Robust Trait Delivery and Containment Platform for Bioenergy Crops	$50,014

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INL - Idaho National Lab

Project ID	Project Name	FY Total
CA114	Enhancement of Separation Methods in Nuclear Fuel Recycling	$232,273
CA115	Investigation of Public Discourse Methods in Energy Policy Decision-making	$164,026
CA116	Development of Lignocellulosic Ethanol Production Potential in Idaho	$149,366
EI101	Chemical Separations and Process Research to Enable Biorefinery Systems	$172,351
EI102	Advanced Predictive Condition Monitoring and Control for Modern Energy Systems: Gasification-based Processes	$293,902
EI104	CFD-Based Simulation Capability of Fischer-Tropsch Reactors and Process Equipment	$344,312
EI105	Biomass Feedstock Assembly to Gasification Process Computational Interface Development	$219,596
EI107	Generation and Expulsion of Hydrocarbons from Oil Shale	$298,643
EI109	Pathways to Energy Independence	$154,695
EI110	Investigation of Fischer Tropsch catalyst deactivation	$199,815
EI111	Altering Wettability by Chemical Amendments to Improve Gas Production from Tight Sands	$149,082
EI112	Adaptive Process Modeling Using Parameter Estimation and Mechanism Sensitivity Analysis	$261,222
FF104	Integrated Mesoscale Approach for the Simulation of Nuclear-Fuel Behavior	$103,428
FF105	Particle-discrete element model simulation of the coupling between material failure/deformation and fluid generation/flow	$96,395
FF106	Scaling of Welding Processes	$96,776
FF107	Enhanced Metal Ion Analysis	$98,979
FF108	Effect of glycosylation on the activity and stability of bacterial enzymes	$97,645
GB103	A Systems Biology Approach to Understanding Lignocellulose Derived Carbon Metabolism by Alicyclobacillus acidocaldarius	$489,525
GB104	Metabolic Engineering of Alicyclobacillus acidocaldarius for Lactic Acid Production from Biomass Derived Monosaccharides	$444,019
GB105	Network Interaction In the Thermoacidophile Alicyclobacillus acidocaldarius In Response to Different Complex Carbon Sources	$197,237
GS101	Reducing CBM Water Discharge Volume	$149,946
IC101	Exploration and Development of Automated Differential Equation-Based System Identification	$209,272
IC102	A Toolset for Proximal Human-Robot Interaction	$138,749

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Project ID	Project Name	FY Total
IC104	Haptic Interface for Robotic Arc Welding	$193,378
IC105	Modeling Interface to Control System Designs	$130,227
IC106	Resilient Control System Network Agents	$137,589
IC107	Integrated Control System Data Fusion	$370,136
IC108	Wireless Sensor Testing	$103,768
IC109	Anomaly Detection, Diagnosis, and Resilient Control	$88,274
NE146	Process Modeling of Solvent Extraction Separations for Advanced Nuclear Fuel Cycles	$278,558
NE147	Reactivity of radiolytically produced nitrogen oxide radicals toward aromatic compounds.	$152,491
NE149	Modernization/Optimization of the Advanced Test Reactor's Core-Analysis Capability to Facilitate Its Operation as a National Scientific User Facility	$292,731
NE150	Viability Evaluations of Linear Variable Differential Transformers (LVDTs) and Capacitive Micro-Machined Ultrasonic Transducers (CMUTs) for In-Pile Instrumentation	$201,325
NE153	Development of Reactor Physics Sensitivity Analysis, Uncertainty Quantification, and Data Assimilation Capability at INL for Validation Applications	$743,065
NE154	Fracture Methods for Reactor Fuel Performance Analysis	$211,106
NE155	Use of Ice Thermal Storage Systems to Improve LWR Plant Efficiency and Relieve the Cooling Water Requirement	$199,565
NE156	Development of a Next-Generation Production Code for Nuclear Reactor System Analysis and Safety Margin Quantification	$981,022
NE157	Characterization of a Consolidated Electrochemical Technique for Separation and Recovery of Actinides from Fission Products in Oxide Fuels	$195,845
NE158	Advanced Instrumentation for In-pile Detection of Thermal Conductivity	$297,593
NN110	Chemical Signatures of Nuclear Proliferation on Particles	$116,719
NN112	Technetium Signature Analysis	$119,548
NN113	Active Interrogation Die-away Assay Development Program	$328,527
NN114	135Xe recovery from the spontaneous fission of 252Cf	$198,458
NN115	Developing a Next Generation, Risk-Informed Approach for Robust and Resilient Design Development (R2D2)	$446,039
NN116	NEUTRON SPECTROMETER DEVELOPMENT	$288,994
NN117	Nuclear Material Detection Using Neutron Time-of-Flight	$192,817

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INL - Idaho National Lab

Project ID	Project Name	FY Total
NN118	On-line Monitoring of Actinide Concentrations for Advanced Aqueous Separation Processes	$144,581
NN119	Develop a Safeguards Approach for INL Pyroprocessing lines for Demonstration to IAEA	$229,640
NN120	Radionuclide Collection-Detection Device for the in situ Remote Monitoring of 99Tc as a Proliferation Indicator	$128,205
NS156	Taylor Cylinder Determination of Impact Material Properties	$263,928
NS161	Development and Evaluation of Low Pressure Energy Absorbing Materials and Methods for Buildings	$488,474
NS162	Modeling of threats and interdependencies upon strategic infrastructures	$248,948
NS163	FAST NEUTRON IRRADIATION CAPABILITY	$238,078
NS164	Trace Explosive Characterization on Materials	$140,530
NS165	Methodologies for the Design, Analysis, and Validation for Operation of Complex Resilient Networks	$120,601
NU100	Human Performance Assessment for Technology Neutral Evaluation: Combining Virtual and Physical Testing for Design, Development and Review of Digital Control Systems and Interfaces	$402,842
NU101	Advanced Ceramic Nuclear Fuels	$733,648
PH101	Cognitive Network Engine and Simulation Framework,Ph.D. Candidate Proposal for Juan Deaton	$158,383
PH102	Application of Dynamic Bayesian Networks to Systems with Ambient Intelligence	$110,489
PH103	Characterization of Fluidized Beds via Pressure-Fluctuation Analysis	$97,967
PH104	Dissolution and Extraction Studies of Fission Products in Room Temperature Ionic Liquids and in Supercritical Fluid CO2 and Determination of Radiolytic Stability	$160,005
PH105	Advanced Adaptive Algorithms in Phased Array Ultrasonics for Materials Inspection	$118,437
RP110	High Temperature In-Pile Instrumentation Enhancements	$208,710
SH100	Microstructure and Deformation Physics of Fission-Reactor Model Materials by Atomistically Informed Mesoscale Simulation	$264,920
SH101	Structural and Electronic Properties of Surfaces and Adsorbed Metal Particles: Applications to Catalysis, Corrosion, and Radiation Effects	$479,004
SH103	Adaptive Modeling of Geometrically Complex Fuel Rods with a posteriori Error Control	$337,037

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INL - Idaho National Lab

Project ID	Project Name	FY Total
SH104	Multi-physics Simulation Methods for Advanced Reactor Analysis	$771,999
ST130	Investigation of Low Temperature Performance in Membrane Materials and Processes for Gas Separations	$152,723
ST131	High-Performance Polymer Membranes for High Temperature Gas Separations	$147,619
ST132	Triazine-Based CO2 Capture Agents	$131,382
ST133	Dynamic Impact Model and Information System to support Unconventional Fuels Development	$197,191
ST134	Near Field Impacts of In-Situ Oil Shale Development on Water Quality-	$267,499
ST135	Advanced Remote Sensing for Energy and Environmental Applications using Unmanned Aerial Vehicles	$293,021
ST136	Addressing the Spectrum of Nuclear Related NDE Needs: A hybrid laser ultrasonic and eddy current approach	$191,598
ST137	Research of Advanced VHTR Core Components	$134,342
ST138	Development of a Sustainable Ecological Engineering approach to support Hybrid energy Systems Development in the Western Inland Energy Corridor	$46,686
TM106	Development of 3D Multiphase Flow and Reactive Transport Codes and their Applications to Reactive Flow in Porous Media and Fracture Apertures	$219,524
TM108	Uncertainty quantification for nuclear fuels performance	$72,509

Total # of Projects for INL: **100** **Total Cost for INL:** **$24,204,211**

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KCP - Kansas City Plant

Project ID	Project Name	FY Total
KCP07286-703665	Carborane Modified Materials	$133,851
KCP08720-703683	Advanced Radar DSP	$215,163
KCP08727-703703	MicroSpring Development	$26,705
KCP08730-703690	Sugar Cube Sensor	$92,831
KCP08735-703709	GTS Valves	$218,956
KCP08742-703702	Optical Monitors for Stronglinks	$228,707
KCP08743-703710	Fiber Laser Welds on Stainless	$174,254
KCP08756-703728	Optical UC R&D	$174,600
KCP08767-703731	MIMO JTA Communication	$30,636
KCP08781-703745	Rapid Response Technology Evaluation	$32,879
KCP08826-703775	Fabrication of Nano-Capacitors	$122,896
KCP09667-703893	Thin Film Electrical Devices/LTCC	$231,693
KCP09829-703888	LTCC Capacitor Technology	$180,797
KCP09830-703896	Comosite Processing Development	$20,448
KCP09832-703898	Software Product Line	$62,113
KCP09833-703901	Forgings Transfer Time Study	$97,148
KCP09834-703902	Forging Model and Stress Indent	$111,692
KCP09835-703995	Weld Quality Investigation	$14,643
KCP09838-703892	Diamond Thin Film Heat Sinks	$241,375
KCP09839-703996	Pyroshock Simulation Study	$47,998
KCP09840-703894	Non Destructive Slapper Test Methods	$138,380
KCP09841-703997	High Velocity Shock Extension	$68,484
KCP09844-703897	Raman Spectroscopy Development	$131,137
KCP09846-703913	Compact TM Receiver and Recorder	$47,066
KCP09847-703908	Filled Joining Material	$65,151
KCP09850-703911	Optical Monitor System	$177,918
KCP09853-703910	Simulation Research for HDEP	$56,812
KCP09854-703915	Noncontact Ultrasonics	$65,444
KCP09855-703909	CEL Simulation Development	$55,225

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KCP - Kansas City Plant

Project ID	Project Name	FY Total
KCP09856-703890	Night Surveillance System	$180,039
KCP09858-703917	Solder Alloy Evaluation	$73,908
KCP09866-703920	Short Range Radar	$191,478
KCP09867-703923	HE Shock Diagnostics	$65,528
KCP09869-703912	Mechanism Machining Material Development	$18,762
KCP09870-703914	Optimized MCM Heat Transfer	$219,144
KCP09872-703924	Optical HV Solid State Switch	$19,974
KCP09876-703770	Improve PMT Optical Interface	$83,554
KCP09877-703855	Mock HE	$93,416
KCP09878-703776	Material Analysis	$148,249
KCP09879-703771	T00 WFO PDRD	$920,521
KCP09880-703772	EIDS Fireset Development	$133,018
KCP09881-703773	Optical Monitors	$137,153
KCP09882-703774	HV Component Research	$66,268

Total # of Projects for KCP: **43** **Total Cost for KCP:** **$5,616,014**

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LANL - Los Alamos National Lab

Project ID	Project Name	FY Total
LANL-20060043DR	Strongly Correlated Electrons: Duality and Implications	$785,623
LANL-20060046DR	Image Reconstruction with Time-Reversal Mirrors	$535,276
LANL-20060437ER	Functional Proteomics Studies of Bacillus anthracis	$149,836
LANL-20061383PRD1	Lifting the Quantum Critical Conundrum	$39,900
LANL-20061388PRD1	Numerical Techniques of Rifting and Passive Margin Formation: The Role of Mantle Plumes	$14,600
LANL-20061395PRD1	Synthesis of Molecular Actinide Nitrides	$197,960
LANL-20061423ER	Improved Length Scaling in Accelerated Molecular Dynamics Methods	$125,459
LANL-20061435ER	Experimental Study of Driven Magnetic Relaxation in a Laboratory Plasma	$93,114
LANL-20061493DR	High-Resolution Physically-Based Model of Semi-Arid River Basin Hydrology	$208,821
LANL-20061524PRD3	Accelerated Molecular Dynamics at Complex Interfaces	$28,999
LANL-20061600PRD4	Ultrafast Phenomena: Short-Pulse laser Interactions with Atoms and Molecules	$6,309
LANL-20061615PRD4	A Chemical Route to Integrate Carbon Nanotubes into Microelectromechanical Systems	$85,637
LANL-20061624PRD4	Self-Organizing Wireless Ad-Hoc and Sensor Networks with Functional Guarantees	$36,734
LANL-20070003DR	Beyond the Neutrino Matrix	$2,226,880
LANL-20070005DR	Dark Energy and the Cosmic Web	$1,498,295
LANL-20070008DR	Novel Inclusion Compounds for Hydrogen Storage	$1,530,806
LANL-20070010DR	Rapid Iterative Detection Using Smart Pathogen Signatures	$1,343,318
LANL-20070013DR	Correlations and Control of Properties of Metallic U and Pu	$2,156,042
LANL-20070023DR	High-Current, High-Energy, Laser-Driven Ion Accelerators: An Enabling and Revolutionary Scientific Research Tool	$1,608,843
LANL-20070028DR	Cold Atom Surface Imaging	$1,580,855
LANL-20070029DR	A Systematic Strategy for Gene Function Discovery	$1,582,798
LANL-20070060DR	Metamaterials for Threat Reduction Applications: Imaging, Signal Processing, and Cloaking	$1,666,763
LANL-20070063DR	The Physics of Algorithms	$1,628,683
LANL-20070064DR	Coexistence of Magnetic and Superconducting Electrons in Strongly Correlated Matter	$1,638,347
LANL-20070074DR	Physics of Helium Retention in Palladium/Tritum Systems	$1,422,364

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LANL - Los Alamos National Lab

Project ID	Project Name	FY Total
LANL-20070077DR	Quantum Control in Condensed Media for Studies of Direct Optical Initiation of Explosives	$1,538,611
LANL-20070096DR	Biomimetic Hydrogen Production by Photoinitiated Transition Metal Catalysis	$1,600,767
LANL-20070099DR	Host-Pathogen Interactions (Pathomics) in Avian Influenza	$1,731,738
LANL-20070131ER	Drug Binding and Catayltic Mechanism in DHFR	$325,582
LANL-20070134ER	Cerium-Doped Glass Scintillators	$325,408
LANL-20070148ER	Substrates for the Detection and Differentiation of Influenza Viridae	$344,454
LANL-20070156ER	Coulomb Mechanisms for Ion Damage in Insulators in the Electronic Stopping Regime	$355,223
LANL-20070160ER	Beta Decay of Polarized Radioactive Atoms in an Optical Tweezer	$432,339
LANL-20070163ER	Nano-Engineered Casimir Forces	$374,760
LANL-20070170ER	Magnetic Turbulence and Kinetic Dissipation in Solar Wind and Solar Corona Plasmas	$339,718
LANL-20070171ER	Understanding Dynamical Diversity of Extrasolar Planets	$326,231
LANL-20070172ER	New Approach to Bayesian Inference Under Modeling Uncertainty	$376,149
LANL-20070173ER	Nano-Structured Foams for Hydrogen Storage	$320,635
LANL-20070176ER	Nano-Composite Scintillator for Neutron Capture Measurements	$358,541
LANL-20070180ER	Understanding a Killer: A Predictive Model of Tumor Development	$340,499
LANL-20070187ER	Sharp characterization of minimizers (typically) involving interfaces in images	$391,708
LANL-20070188ER	Probing Correlated Electron Behavior via Direct Uranium-235 Nuclear Magnetic Resonance	$298,257
LANL-20070195ER	Instabilities Driven Turbulence and Mixing in Convergent Geometries	$301,466
LANL-20070202ER	Moment-Based Interface Tracking for Multi-Material Flows	$329,094
LANL-20070204ER	Synthesis of Nanowire Heterostructures for Strain-Controlled Bandgap Engineering	$348,501
LANL-20070234ER	Cold Atom Quantum Liquid Mixtures	$338,331
LANL-20070235ER	Investigation of Energetic Ion Generation and Transport in Ultra-Intense Laser-Matter Interaction	$379,124
LANL-20070243ER	Hyperbolic Polynomials Approach to Approximate Counting and Lower/Upper Bounds in Combinatorics, Statistical Physics and Computational Geometry	$405,682
LANL-20070256ER	Excited States and Optical Response of Nanosized Molecules at Linear Scaling Numerical Cost	$355,297
LANL-20070267ER	An Experimental and Theoretical Framework for Reactive Micromixing	$286,162

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LANL - Los Alamos National Lab

Project ID	Project Name	FY Total
LANL-20070270ER	Synthetic Decoys for Biothreat Agents	$317,800
LANL-20070276ER	New States of Matter in Stars, Nuclei and Cold Atoms	$319,034
LANL-20070330ER	Magnetic Resonance Force Microscopy Studies of Ferromagnets on a Nanometer Scale.	$320,615
LANL-20070338ER	From Novel Principles to Novel Device Structures for High-Efficiency Generation of Solar Electricity	$367,829
LANL-20070349ER	Ultra-Low Field Resonant Absorption Magnetic Resonance Imaging of Neural Activity	$406,280
LANL-20070367ER	X, Gamma, Alpha : Ultra-High Resolution Spectroscopy	$354,859
LANL-20070368ER	A Novel Approach to Manufacturing Ultra-Tall Carbon Nanotube Forests	$304,240
LANL-20070380ER	Controlling Oxidation-States in Actinide-Oxides through Crystal Lattice Pinning	$366,978
LANL-20070382ER	Unique Observations of Nature’s Largest Explosions	$327,003
LANL-20070416ER	Agent-Based Modeling and Simulation of Cellular Signaling Systems	$330,830
LANL-20070421ER	Fast Approximation Algorithms for Systems of Linear Inequalities	$390,276
LANL-20070436ER	Optical, Electronic, and Magnetic Doping of ENABLE Grown Semiconducting Films	$348,336
LANL-20070441ER	Subsurface Transport Parameter Estimation with Multiscale, Multiobjective Optimization	$270,854
LANL-20070445ER	Tunable Infra-Red Chromophores through N-Type Doping of Wide-Gap Semiconductor Nanocrystals	$364,771
LANL-20070451ER	Non-Precious Metal Nanocomposites for Fuel Cell Catalysis	$346,964
LANL-20070483ER	Minimal Description of Complex Shapes with Applications to Experiments and Validation of Large-Scale Codes	$398,510
LANL-20070488ER	Electron-Neutrino Correlation in Neutron Beta Decay	$287,275
LANL-20070505DR	Multiscale Modeling of Strongly Interacting Systems	$632,999
LANL-20070506ER	Experimental and computational studies of magnetic bubble expansion as a model for extra-galactic radio lobes	$259,306
LANL-20070518DR	Development of a Magnetically Driven Target for Thermo-Nuclear Burn Studies (*U)	$1,541,900
LANL-20070525PRD1	Molecular Actinide Alkylidene Complexes	$29,710
LANL-20070541PRD1	Superconductivity in Non-Centrosymmetric Materials	$30,242

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LANL - Los Alamos National Lab

Project ID	Project Name	FY Total
LANL-20070560PRD1	Creating a Mathematical Foundation for High-Dimensional Search and Optimization Algorithms to Solve Complex Nonlinear Models	$221,115
LANL-20070574PRD1	Gamma-Ray Bursts and Gravitational Waves from Compact Mergers	$204,116
LANL-20070585PRD2	Multifunctional Copper-Carbon Nanotube Nanocomposites	$106,131
LANL-20070626PRD2	Theoretical and Experimental Investigation of Relaxation Mechanisms in Ultra-low Field NMR for Magnetic Resonance Imaging	$81,574
LANL-20070640PRD2	Multiscale Simulations for Cascade Overlap in Irradiated Materials	$93,771
LANL-20070645PRD2	The Role of NS1 in Disrupting Immune Responses During Influenza Infection: a Modeling and Experimental Approach	$97,238
LANL-20070649PRD2	Noise in Biochemical Networks: Rigorous Analysis with Field-Theoretic Tools	$66,405
LANL-20070654PRD2	Ultrafast Non-equilibrium Physics of the Fractional Quantum Hall System	$144,492
LANL-20070658PRD2	Detecting the Highest Energy Gamma-Rays and Neutrinos to Determine the Origin of Cosmic Rays	$144,229
LANL-20070688PRD3	Photodegradation of Leaf Litter in Water-Limited Ecosystems	$90,418
LANL-20070690PRD3	Time-Dependent Density Functional Theory for Ultrafast Optical Phenomena in Strongly Correlated Electron Materials	$132,903
LANL-20070701PRD3	Anti-Neutrino Oscillation and Cross Section Measurements at MiniBooNE	$127,298
LANL-20070705PRD3	Phase Transitions in Quantum Systems and Quantum Information	$143,559
LANL-20070722PRD3	Sensitization of Lanthanide Ion Fluorescence Using Nanocrystal Quantum Dots	$157,826
LANL-20070723PRD3	Chemically Synthesized Germanium Nanocrystals for Applications in Solar-Energy Conversion	$139,206
LANL-20070751PRD4	Detecting Dark Matter with Cryogenic Liquids	$140,873
LANL-20070760PRD4	Pore-Scale Modeling of Multiphase Flow and Reaction in Charged Porous Media	$151,312
LANL-20070765PRD4	Modeling Fast Basal Sliding of Ice Sheets for Climate and Sea Level Prediction	$120,128
LANL-20070766PRD4	Molecular Level Investigation of Tunable Energetic Mixtures	$126,228
LANL-20070768PRD4	Synthesis, Chemistry and Theoretical Studies of 5f-Element Hydride Complexes	$152,879
LANL-20070775PRD4	The Dynamics of Dark Energy	$82,440
LANL-20070781PRD4	Modeling the Immune Response to Pathogens	$95,599
LANL-20080001DR	One-Step Biomass Conversion: Looking to Nature for Solutions to Energy Security	$1,356,843
LANL-20080009DR	Prompt and Radiochemical NTS Diagnostics and New Measurements (U)	$1,482,400

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LANL - Los Alamos National Lab

Project ID	Project Name	FY Total
LANL-20080015DR	Hot Spot Physics and Chemistry in Energetic Materials Initiation	$1,532,029
LANL-20080031ER	Precision Cosmology and the Neutrino Sector	$328,236
LANL-20080037DR	Design, Synthesis, and Theory of Molecular Scintillators	$1,683,725
LANL-20080039DR	Global Monitoring of the Sky with Thinking Telescopes: Finding and Interrogating Cosmic Explosions	$1,596,120
LANL-20080040DR	Automated Change Detection in Remote Sensing Imagery	$1,480,082
LANL-20080057DR	Carrier Multiplication in Nanoscale Semiconductors for High-Efficiency, Generation-III Photovoltaics	$1,190,997
LANL-20080080ER	Finding the First Cosmic Explosions	$353,162
LANL-20080085DR	Construction and Use of Superluminal Emission Technology Demonstrators with Applications in Radar, Astrophysics, and Secure Communications	$1,336,612
LANL-20080097DR	Ultrafast Nanoscale XUV Photoelectron Spectroscopy	$1,525,621
LANL-20080114DR	Advanced Fuel Forms with Microstructures Tailored to Naturally Induce Fission Product Separation During Service	$1,567,920
LANL-20080116DR	Probing Physics Beyond the Standard Model through Neutron Beta Decay	$1,340,648
LANL-20080126DR	Flash before the Storm: Predicting Hurricane Intensification using LANL Lightning Data	$1,441,414
LANL-20080128ER	Nonconvex Compressed Sensing	$294,769
LANL-20080130DR	Cosmic Explosions Probing the Extreme: X-Ray Bursts, Superbursts, and Giant Flares on Neutron Stars	$2,203,918
LANL-20080138DR	Genomes to Behavior: Predicting Bacterial Response by Constrained Network Interpolation	$1,657,640
LANL-20080164ER	Materials and Device Optimization towards Room Temperature Spin-Transport through Single-Walled Carbon Nanotubes	$371,517
LANL-20080182ER	Foundations for Practical Pattern Recognition Systems	$341,817
LANL-20080201ER	The First Precise Determination of Quark Energy Loss in Nuclei	$335,480
LANL-20080210ER	Terahertz Generation Harnessing the Two-Stream Instability	$298,673
LANL-20080221ER	Nano-Fission-Material based Neutron Detectors	$342,300
LANL-20080228ER	Efficient Structures for Low-Energy Acceleration of Light Ions	$269,850
LANL-20080230ER	Identifying High Risk Species Critical for the Emergence of Pandemic Influenza	$327,163
LANL-20080268ER	The Effect of Acoustical Waves on Stick-Slip Behavior in Sheared Granular Media: Implications for Earthquake Recurrence and Triggering	$346,813

LANL - Los Alamos National Lab

Project ID	Project Name	FY Total
LANL-20080300ER	Multilevel Adaptive Sampling for Multiscale Inverse Problems	$254,065
LANL-20080317ER	Detection of Respiratory Infection by Scent	$278,229
LANL-20080321ER	Developing a Remote Sensing of the Solar Surface	$332,979
LANL-20080323ER	Spins in Organic Semiconductors	$354,366
LANL-20080341ER	Adaptive Algorithms for Inverse Problems in Imaging	$341,393
LANL-20080342ER	Entanglement in Quantum Ground States	$339,204
LANL-20080380ER	Designing Communication Methods for Bottom-Up Self-Assembled Nanowire Networks of Emerging Computer Architectures	$279,252
LANL-20080391ER	Stochastic Transport on Networks: Efficient Modeling And Applications to Epidemiology	$330,308
LANL-20080394ER	Strain-induced Novel Physical Phenomena in Epitaxial Ferroic Nanocomposites	$343,832
LANL-20080395ER	Genetically Engineered Polymer Libraries	$339,266
LANL-20080409ER	Compact Millimeter Wave Spectrometer Based on a Channel Drop Filter	$261,509
LANL-20080414ER	Novel High Performance Terahertz Metamaterial Photonic Devices	$343,905
LANL-20080424ER	CP-violating Moments of Atoms and Nuclei	$308,039
LANL-20080448ER	Critical and Crossover Behaviors at Jamming Transitions	$325,985
LANL-20080464ER	A New Approach to Unravel Complex Microbial Community Processes	$373,408
LANL-20080473ER	Ultrafast Nanoplasmonics for Photonics and Quantum Control at the Nanoscale	$331,979
LANL-20080519ER	Probing Unconventional Superconductivity in Heavy Fermion Thin Films	$306,237
LANL-20080523ER	Photocatalytic Materials Based on Quantum Confined Semiconductor Nanocrystals	$498,402
LANL-20080562ER	Time-reversible Born-Oppenheimer Molecular Dynamics	$331,021
LANL-20080603ER	Nonequilibrium Mechanics of Geomaterials	$355,460
LANL-20080618ER	Evolution and Function of Microbial Signatures	$342,171
LANL-20080636ER	Probing physics beyond the Standard Model with supernovae	$299,789
LANL-20080660ER	Novel Materials for Gamma-Ray Detection based on Nano-Engineered Semiconductor Nanocrystals*	$144,713
LANL-20080661DR	Novel Signatures of Beyond the Standard Model at the Large Hadron Collider*	$530,012
LANL-20080662DR	Information Science and Technology: Metagenomics*	$808,515
LANL-20080663DR	High-Precision Spectroscopic Search for Variation of the Fine-Structure Constant*	$1,479,719

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LANL - Los Alamos National Lab

Project ID	Project Name	FY Total
LANL-20080671DR	Statistical Physics of Networks, Information and Complex Systems*	$640,597
LANL-20080673DR	Complex Biological and Bio-Inspired Systems*	$665,955
LANL-20080689PRD1	Dynamics of Quantum First Order Phase Transitions	$131,755
LANL-20080695PRD1	First-Principles-Based Equations of State Including Multi-Phase Chemical Equilibrium	$136,336
LANL-20080698PRD1	Strong dynamics in Physics Beyond the Standard Model	$144,069
LANL-20080700PRD1	Study of Hybrid Semiconductor/Molecular Systems for Photo-production of Hydrogen	$129,990
LANL-20080703PRD1	Spectroscopic Studies and Photonic Applications of "Giant" Nanocrystal Quantum Dots	$129,695
LANL-20080705PRD1	Structure-Property Relationship for Strained One Dimensional Ferroelectric Nanostructures	$73,208
LANL-20080716ER	Coupling of Genetics and Metabolism and the Orgin of Life*	$366,447
LANL-20080718ER	Accuracy of Laser-Induced Breakdown Spectroscopy for Trace Detection	$160,170
LANL-20080723PRD2	Nonequilibrium Quantum Phase Transitions	$188,629
LANL-20080724PRD2	Towards Human Level Artificial Intelligence: A Cortically Inspired Semantic Network Approach to Information Processing and Storage	$133,226
LANL-20080726PRD2	Modeling control of viruses by immune responses	$144,462
LANL-20080727PRD2	Multi-scale Analysis of Multi-physical Transport Processes of Electroosmosis in Porous Media	$184,053
LANL-20080728PRD2	Dissipation and Decoherence in Complex Many-Body Systems	$190,525
LANL-20080729DR	Information Science and Technology: Streaming Data	$569,748
LANL-20080730PRD2	Finite State Projection for Accurate Solution of the Master Equation	$141,667
LANL-20080731PRD2	Strongly Coupled Fermion Systems: From Atomic Gases to Dark Matter	$137,246
LANL-20080733ER	New Frontiers in Viral Phylogenetics	$86,707
LANL-20080735ER	Three-Dimensional Dynamics of Magnetic Reconnection in Space and Laboratory Plasmas*	$226,621
LANL-20080743ER	The Roadrunner Universe	$468,345
LANL-20080744ER	Implicit Monte Carlo Calculations of Supernova Light-Curves	$122,647
LANL-20080747ER	Instabilities Driven Reacting Compressible Turbulence	$172,475
LANL-20080755ER	Cellulosomes in Action: Peta-Scale Atomistic Bioenergy Simulations	$256,756

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LANL - Los Alamos National Lab

Project ID	Project Name	FY Total
LANL-20080759ER	Parallel-Replica Dynamics Study of Tip-Surface and Tip-Tip Interactions in Atomic Force MicrosCopy and the Formation and Mechanical Properties of Metallic Nanowires	$258,149
LANL-20080761ER	Saturation of Backward Stimulated Scattering of Laser In The Collisional Regime	$259,024
LANL-20080780PRD2	Synthesis and Characterization of Novel Metal-Organic Frameworks for Hydrogen Storage	$146,558
LANL-20080782PRD3	Creating Schrodinger Cats Using a Bose-Einstein Condensate	$132,357
LANL-20080784PRD3	Bio-Directed Assembly of Multicolored One-Dimensional Quantum Dot Light-Emitting Devices	$116,650
LANL-20080785PRD3	Semiconductor Nanowire Heterostructures	$142,819
LANL-20080786PRD3	Matter and Light	$129,321
LANL-20080787PRD3	Statistical Physics of Optimization	$135,367
LANL-20080788PRD3	Fluvial Geomorphic Response to Permafrost Thawing: Implications for the Global Carbon Budget and Arctic Hydrology	$143,370
LANL-20080789PRD3	Determinaing the Mechanisms of Enzymes Xylose Isomerase and HIV Protease using Neutron Crystallography	$136,867
LANL-20080791PRD4	Local Atomic Arrangements in Phase Change Materials	$111,372
LANL-20080792PRD4	Richtmyer-Meshkov Instability Studies	$16,409
LANL-20080793PRD4	Effect of Charging on Carrier Relaxation Dynamics in Quantum Confined Semiconductor Nanocrystals	$125,095
LANL-20080794PRD4	The Kondo Lattice Problem	$100,923
LANL-20080795PRD4	Classical/quantum Mechanical Simulations of Electronic Nanomaterials	$138,494
LANL-20080796PRD4	Chiral Metamaterials for Terahertz Frequencies	$122,404
LANL-20080797PRD4	Energy Transfer Processes in Type-Specific Single-Walled Carbon Nanotubes	$111,876
LANL-20080798PRD4	3-Dimensional Tracking of Single Quantum Dots: The Case for 2-Photon Excitation	$59,345
LANL-20090006DR	Synthetic Cognition through Peta-Scale Models of the Primate Visual Cortex	$1,574,486
LANL-20090017DR	Predictive Design of Noble Metal Nanoclusters	$1,622,398
LANL-20090022DR	Understanding Anisotropy to Develop Superconductors by Design	$1,720,875
LANL-20090035DR	Spatial-temporal Frontiers of Atomistic Simulations in the Petaflop Computational World	$1,468,505
LANL-20090053DR	Double Beta Decay	$2,136,396
LANL-20090058DR	Turbulence By Design	$1,742,721

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LANL - Los Alamos National Lab

Project ID	Project Name	FY Total
LANL-20090061DR	Enhance Radiation Damage Resistance via Manipulation of the Properties of Nanoscale Materials	$1,625,926
LANL-20090098DR	Understanding Drug Resistance and Co-infectivity in HIV and TB Infections	$1,707,161
LANL-20090104DR	RADIUS: Rapid Automated Decomposition of Images for Ubiquitous Sensing	$1,395,567
LANL-20090117DR	Distributed Metabolic Regulation: the Key to Synthetic Biology for Carbon Neutral Fuels	$1,436,099
LANL-20090163ER	Using Small Molecules to Control RNA Conformations	$351,625
LANL-20090174ER	Understanding the Feedback of Active Galaxies in Galaxy Clusters	$356,757
LANL-20090176ER	The First Characterization of Large Interstellar Dust	$284,989
LANL-20090186ER	Molecular Scale Shock Response of Explosives	$347,364
LANL-20090187ER	Multifunctional Materials	$372,002
LANL-20090189ER	Efficient and Selective Photon Detection	$383,139
LANL-20090202ER	Functional Gene Discovery Using RNAi-based Gene Silencing	$416,032
LANL-20090210ER	Developing Adaptive High-Order Divergence-Free Methods for Magneto-Hydrodynamics Turbulence Simulations	$354,038
LANL-20090217ER	Soild Helium-4: A Supersolid or Quantum Glass?	$399,571
LANL-20090250ER	Efficient Interdiction	$366,016
LANL-20090253ER	Photodynamics and Photochemistry of Carbon Nanotube Materials	$372,042
LANL-20090260ER	Compositionally Graded InGaN-based High Efficiency Photovoltaic Devices	$381,314
LANL-20090265ER	A Novel Millimeter-Wave Traveling-Wave Tube Based on an Omniguide Structure	$496,977
LANL-20090269ER	Development of a Muon to Electron Conversion Experiment at LANSCE/MaRIE: Search for Physics beyond the Standard Model	$399,548
LANL-20090284ER	Unconventional Methods for Quantum-enhanced Metrology	$410,614
LANL-20090303ER	First Unambiguous Measurement of Jet Fragmentation and Energy Loss in the Quark Gluon Plasma	$605,983
LANL-20090305ER	A Visionary New Approach to Assess Regional Climate Impacts on Vegetation Survival and Mortality	$409,345
LANL-20090306ER	Breakthroughs in Magnetic Reconnection Enabled by Petaflop Scale Computing	$312,601
LANL-20090312ER	Disentangling Quantum Entaglement	$713,805
LANL-20090321ER	Compact Solid State Tunable THz Source	$429,646

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LANL - Los Alamos National Lab

Project ID	Project Name	FY Total
LANL-20090325ER	Plasmonic Bandgap Materials: Fusion of Interparticle and Particle-Photon Interactions at the Nanoscale	$381,342
LANL-20090335ER	Probing the Origin and Consequences of Quantum Critical Fluctuations	$333,091
LANL-20090363ER	Membrane Micro-chromatography: A Novel Approach to Preparative Nucleic Acid Sample Processing	$373,224
LANL-20090369ER	Linear Scaling Quantum-Based Interatomic Potentials for Energetic Materials	$324,240
LANL-20090393ER	Transparent Organic Solar Cells	$451,767
LANL-20090394ER	Backward Stimulated Raman and Brillouin Scattering of Laser in the Collisional Regime	$276,061
LANL-20090397ER	Uranium Imido Complexes as Catalysts for the Reduction of Carbon Dioxide	$368,770
LANL-20090410ER	Transport in Magnetized Dense Plasmas for Magneto-Inertial Fusion	$352,547
LANL-20090420ER	A Hybrid Transport-Diffusion Method for Radiation Hydrodynamics	$190,616
LANL-20090424ER	Robust 3D moving mesh adaptation based on Monge-Kantorovich optimization	$407,743
LANL-20090425ER	Isotopic Tracer for Climate Relevant Secondary Organic Aerosol	$394,094
LANL-20090443ER	Evolving a Thermostable Cellulase by Internal Destabilization and Evolution	$372,654
LANL-20090466ER	Novel Cone Targets for Efficient Energetic Ion Acceleration for Light Ion-Driven Fast Ignition Fusion	$409,147
LANL-20090475DR	Seaborg Institute Fellows	$1,268,575
LANL-20090476DR	New and Enhanced Capabilities in Quantum Information Processing	$414,039
LANL-20090477DR	Revolutionary Science at the Intersection of Extreme and Transient Events, Natural Hazards, and National Security	$1,244,205
LANL-20090481ER	The Dynamics of Change in Global Energy Systems	$145,461
LANL-20090482ER	Chemical Chronometers for Nuclear Forensics Applications	$188,390
LANL-20090483ER	Superconducting Nanowire Single Photon Detector Development	$332,863
LANL-20090484ER	Transformative Capability for Bioassessment of Engineered Nanomaterials	$239,312
LANL-20090485ER	Inferring Functional Determinants of Microbe Pathogenicity by Computational Pathogen Characterization	$152,646
LANL-20090486ER	Assimilation and Prediction of Low Earth Orbit (LEO) Environment for Space Situational Awareness	$143,599
LANL-20090487ER	Large-Scale, Carbon-Sequestration Flows—Laboratory Measurement and Simulation	$152,922
LANL-20090488ER	Feasibility of GHG Monitoring from Space: Verification of Los Angeles emissions	$266,501

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LANL - Los Alamos National Lab

Project ID	Project Name	FY Total
LANL-20090489ER	Lagrangian Approach to Capturing Interactions Between Wind-Energy Turbines and Atmosphere	$58,045
LANL-20090490ER	High-Nitrogen Polydentate Ligands for Lanthanide/Actinide Separations	$171,502
LANL-20090491PRD1	Unconventional Superconductivity in Heavy Fermion Materials	$94,979
LANL-20090492PRD1	Vanadium Catalyzed Aerobic Oxidations	$82,864
LANL-20090493PRD1	Disorder in Frustrated Systems	$81,983
LANL-20090498PRD2	Measurement of Transverse Single-Spin Asymmetries of Neutral Pion and Eta Meson Production in Polarized p+p Collisions Using the PHENIX Detector at RHIC	$124,317
LANL-20090499ER	Designing Intelligence into the Next Generation Wind Turbine	$282,625
LANL-20090508ER	A New Architecture Revolution for Supercomputing	$190,589
LANL-20090513PRD1	In situ X-ray Microdiffraction Study of Nanomechanical Behavior	$94,355
LANL-20090514PRD1	Novel Fabrication of Metal-Semiconductor Heterostructured Nanowires	$100,830
LANL-20090515ER	High Altitude Water Cherenkov Observatory	$178,147
LANL-20090516PRD1	Multiscale Variational Approaches to Markov Random Fields	$77,142
LANL-20090517ER	Advanced Measurements in Designed Nanostructures to Establish Measurement Techniques for Electrosynthetic Production of Fuels	$117,114
LANL-20090518ER	General Relativity as a Probe of Cosmology	$111,249
LANL-20090519PRD2	Nanogenerators Driven by Both Magnetic and Mechanical Waves	$65,497
LANL-20090520PRD2	Quantum Information Processing: Capabilities and Limitations	$102,751
LANL-20090521PRD2	Exploring the Expanding Universe and the Nature of Dark Energy	$77,317
LANL-20090522PRD2	Neutrino Physics and Its Applications	$25,399
LANL-20090524PRD2	Analysis of Protein Structure-Function Relations in Antibiotic Biosynthesis and Signal Transducing Receptors	$87,099
LANL-20090525PRD2	Non-equilibrium Phenomena in Physics, Biology and Computer Science	$78,341
LANL-20090526PRD2	Carbon and Oxygen Isotopic Variability in Succulent Plants and Their Spines: A New Tool for Climate and Ecosystem Studies in Desert Regions	$74,995
LANL-20090527PRD2	Probing Molecular Physics of Biological Nano-channels: from Viruses to Biosensors	$63,766
LANL-20090528PRD2	Theoretical/Computational Research on Particle Acceleration by Intense Laser Pulse	$13,517
LANL-20090529ER	Simulating Vegetation Impacts on River Basin Water Balance	$296,051
LANL-20090532PRD3	Single-Nanocrystal Photon-Correlation Studies of Carrier Multiplication	$16,531

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LANL - Los Alamos National Lab

Project ID	Project Name	FY Total
LANL-20090534PRD3	New Generation of Fluorescent Probes for In-Vivo Imaging	$19,414
LANL-20099999ER	Post-Project Debits and Credits	$217,880

Total # of Projects for LANL: **268** **Total Cost for LANL:** **$125,761,776**

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LBNL - L. Berkeley National Lab

Project ID	Project Name	FY Total
LB06031	Fabrication of Photovoltaic Devices Using Nanostructured Biomaterials	$132,959
LB06035	Expression Profiling of Radiation and Cancer Susceptibility Genes	$225,068
LB07004	Soft Collinear Effective Theories Applied to Collider Physics	$314,897
LB07005	Structured, Adaptive Mesh Refinement Method for Multiphase Reactive Transport in Groundwater	$291,066
LB07007	On-demand Overlays for Scientific Applications	$148,234
LB07008	Applications of Adjoint Field Methods and Time-Reversal Data Processing to Inverse Problems in Electromagnetic, Seismics, and Ultrasonics	$176,873
LB07009	Chemical Reactions at Liquid/Vapor Interfaces Probed by Photoemission Spectroscopy	$136,382
LB07010	Functional Interactomics: Integrating Physical and Functional Interaction Networks	$303,647
LB07012	New Experimental Initiative to Deduce (n,f) Cross Sections for Advanced Fuel Studies	$194,745
LB07014	Understanding the Chemistry of Innovative Air Cleaning Technologies	$18,705
LB07015	FEL Concepts for Multiple Independent X-ray Beamlines	$275,173
LB07016	Building In-Situ Electronic Structure Study Capability with Photon-in/ Photon-out Soft X-ray Spectroscopy	$212,925
LB07020	Physics Detector and Sensor Technologies Applied to Geological and Geophysical Applications at DUSEL	$277,853
LB07025	Baryon Oscillations and Dark Energy: Prototyping Instruments	$72,845
LB07031	High Brightness Cathodes as Electron Sources for FELs	$282,305
LB07033	Ultra-high Resolution Optics for Soft X-ray Inelastic Scattering	$261,875
LB07034	Emittance Manipulation and Beam Conditioning for FELs	$337,031
LB07036	Chinas Energy Future: Changes in Energy Intensity	$186,953
LB07040	Quantifying the Quantum Backaction of a Non-Linear Dispersive Measurement	$103,367
LB08001	Optimization of Flux Pinning Type II Superconductor Based Magnets for Soft X-ray Scattering Applications	$255,082
LB08002	Holistic Approach to Energy Efficient Computing Architecture	$761,860
LB08003	Low Order Models for Simulation for Ballistic Transport in Nanoscale Devices	$171,918
LB08004	Integrated Earth Systems Climate Modeling and Analysis	$279,309
LB08005	Understanding the Nanothermodynamics of Molecular Machines	$190,973
LB08007	Development of Nanowire Carpet Hybrid Pixel (NCHyP) Detectors	$118,155

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LBNL - L. Berkeley National Lab

Project ID	Project Name	FY Total
LB08008	Probing Transient Molecular Entanglement Using Femtosecond High Resolution Delayed-field Coincidence Imaging	$131,628
LB08009	Soft X-ray Scattering as a New Probe of Polymer Systems	$344,119
LB08011	Development of a 100 km3 Neutrino Detector for Extremely High Energy Neutrinos	$240,210
LB08012	Genome Organizer in Carcinogenesis	$317,596
LB08013	Light-Boosted Fermentation in the Yeast Saccharomyces Cervisiae	$211,999
LB08015	Energy-Smart Disk-Based Mass Storage System	$177,027
LB08017	Quantum Information Science with Integrated Color Centers in Diamond	$201,795
LB08018	Coupled Process Models and Monitoring for Advanced Nuclear Fuel Cycles	$354,563
LB08019	Development of a Laser Goniometer for X-ray and Electron Diffraction Microscopy	$173,158
LB08020	Decoding Dark Energy with Weak Gravitational Lensing	$171,511
LB08021	Metal Nitrosyl Complexes and Catalytic C-H Bond Functionalization	$152,373
LB08022	Experimental Demonstration of a Laser-Plasma-Accelerator Driven Free-Electron Laser	$581,164
LB08023	Lorentz Compaction of Scales for Ultra-efficient Simulation of Advanced Accelerators (and other systems)	$198,207
LB08026	Novel Techniques to Characterize Secondary Organic Aerosols Formed From Gas-phase Volatile Organic Compounds Emitted From Biogenic Sources	$144,308
LB08027	Interaction of Fragile X Mental Retardation Protein with Thymine-DNA Glycosylase: Implication in the Molecular Mechanism of Fragile X Syndrome	$71,401
LB08028	Advance Silicon Detectors for Future Short Pulse X-ray Sources	$153,016
LB08029	Transport in Thin Polymer Films	$170,494
LB08030	Conducting Metal-Organic Frameworks	$143,845
LB08033	Maximizing Photosynthetic Yield by Increasing Sink Strength	$423,806
LB08034	Microbiomics of Complex Microbial Communities in Environmental Samples	$402,854
LB08035	Enhancing the Effectiveness of Manycore Chip Technologies for High-End Computing	$219,264
LB08036	Reference Benchmarks for the Dwarfs (Algorithms)	$211,829
LB08037	Development of a Building Operating Platform	$114,946
LB08038	Using New Microbial Assays to Characterize Dampness-related Exposures	$135,701

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LBNL - L. Berkeley National Lab

Project ID	Project Name	FY Total
LB08039	Using IP Telephony and Wireless Technologies to Extend the Reach of Conventional Building Automation Systems	$184,760
LB08040	Software for Integrated Analysis of Sensor Data for Advanced Energy Controls	$119,632
LB08041	Building Informatics Environment Enabling Rapid Prototyping and Model Extraction for Building Automation Systems	$147,860
LB08043	R&D for Fast, Low-noise CCD Readout and Single Photon Detection Capability	$220,927
LB08044	Understanding the Electronic Energy Level Alignment at Nanoscale Interfaces	$136,395
LB08046	Calibrating Baryon Acoustic Oscillations for Future Dark Energy Experiments	$139,107
LB08047	Integrated Tools in Multiscale Imaging	$409,648
LB08048	Development of Multi-Modular Assemblies with Reduced Material and Services for Specifications of Future Particle Tracking	$176,364
LB09001	Development of Reusable Software Modules for the Analyses of bioSAXS Data	$142,305
LB09002	Synthesis and Characterization of Self-Assembled Battery Electrodes	$138,733
LB09003	Embedded Engineering, Construction Materials, and HVAC Components in Modular Energy Systems Simulation	$175,937
LB09004	High Throughput Measurements of In Vitro DNA Binding By Single Molecule Microscopy and Microfluidic Automation	$224,333
LB09005	Structural and Functional Characterization of DNA Translocation Across Membranes by SpoIIIE Using Advanced Microcopies	$142,622
LB09006	Linking Genomics, Proteomics and Ultrastructural Characterization of Microbial Communities and Their Viruses	$176,832
LB09007	Experimental Accelerator R&D Toward a Future Light Source	$1,207,126
LB09008	Engineering Environmental Sensitivity in an Artificial Cell	$132,998
LB09009	Development of In Situ Cells for Reactive Spectroscopic and Microscopic Studies	$130,640
LB09010	Applications of Hybrid Live Cell Synthetic Devices for Cancer Research	$203,998
LB09011	Dynamics of Homogeneous Catalysis Reactions Investigated with Transient Two-Dimensional Infrared Spectroscopy on the Pico- to Microsecond Timescale	$128,403
LB09012	Development of Novel Improved Capacitors for Pulse Power Applications	$173,339
LB09013	Impact of Climate Change on Soil Water Dynamics in Arid Areas	$150,918
LB09014	Probabilistic Optimization of Energy Systems in Buildings	$148,379

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LBNL - L. Berkeley National Lab

Project ID	Project Name	FY Total
LB09015	Relating Tissue Residues to Chemical Sources in a Bayesian Framework Combining Indoor Chemistry, Pharmacokinetics, and Biomarkers	$147,398
LB09016	SPARKLE- A Fluorescence Energy Transfer (FRET) Methodology for Visualization of Simultaneous and Reversible Interactions	$422,469
LB09017	Solution-Processed Inorganic Composites with Mixed Transport Characteristics	$130,324
LB09018	In Situ Electromagnetic Probing in a Transmission Electron Microscope (TEM)	$155,180
LB09019	Assessing Epigenomic Approaches for Gene Enhancer Discovery	$174,534
LB09020	Self-Tuning Building Energy Model	$174,820
LB09021	Improved Electron Detection System for Extreme Angle-Resolved Photoemission Experiments	$199,956
LB09023	Identifying and Predicting Climate Change Impacts on the Land-Based Components of the Water Cycle	$178,833
LB09024	Inverse Approach to Characterizing Uncertain Economic Drivers of Global Climate Change	$135,157
LB09025	Bio Energy Technologies and Science Integrated Efficiently (BETSIE)	$181,233
LB09026	Ultra-sensitive Ge Detectors for Low-background Physics Experiments	$217,303
LB09027	Microscopic Mechanism of Resistance Switching Memory Effect	$141,887
LB09028	Managing Petascale Data with Emerging Computer Architectures	$162,026
LB09029	Self-assembly of Membrane Proteins	$207,960
LB09030	X-Ray Optical Metrology for Coherence-Preserving Adaptive Optics	$225,657
LB09031	Theoretical Study of Nucleon Structure	$145,975
LB09032	Biological Methods for Synthesis of Iron-based Nanomaterials	$132,440
LB09033	Control of Intraflagellar Transport in Chlamydomonas Cells	$201,312
LB09034	X-ray Studies of Charge-Order Dynamics in Complex Materials	$164,309
LB09035	Uncoverinig the Mechanistic Basis for Soil Microbial Community Response to Altered Precipitation Patterns	$100,650
LB09036	High Quantum Yield Multi-Alkali Cathodes for psec Pulsed Electron Sources	$37,563

Total # of Projects for LBNL: **92** **Total Cost for LBNL:** **$19,625,256**

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LLNL - L. Livermore National Lab

Project ID	Project Name	FY Total
06-ERD-013	Biophysical Characterization of Pathogen Invasion	$137,118
06-ERD-037	Long-Timescale Shock Dynamics of Reactive Materials	$71,504
06-ERD-040	Thermal-Fluidic System for Manipulating Biomolecules and Viruses	$2,452
06-ERD-057	Francisella tularensis: Understanding the Host-Pathogen Interaction	$110,818
06-ERD-059	A Novel Structure-Driven Approach to Sequence Pattern Definition for Remote Homology Detection	$250,112
06-ERD-061	Characterization and Quantification of Dynamic Robustness in Biological Systems	$208,902
06-ERD-065	A Compact, High-Intensity Neutron Source Driven by Pyroelectric Crystals	$299,411
06-ERD-067	Transport Behavior and Conversion Efficiency in Pillar-Structured Neutron Detectors	$319,599
06-SI-001	Novel High-Energy-Density Source	$145,754
06-SI-003	Developing and Integrating Novel technologies for the Production and Characterization of Membrane Proteins	$267,667
06-SI-005	Transformational Materials Initiative	$2,945,434
07-ERD-004	Multipulse, High-Energy Backlighting for a Compton-Radiography Ignition Diagnostic for High-Power Lasers	$199,718
07-ERD-005	Cladding-Pumped Raman Fiber Lasers	$191,611
07-ERD-007	Kinetics of Phase Evolution: Coupling Microstructure with Deformation	$946,733
07-ERD-013	Developing a First Principles Computational Toolkit for Predicting the Structural, Electronic, and Transport Properties of Semiconductor Radiation-Detection Materials	$259,908
07-ERD-014	Maximizing the Science from Astrophysical, Time-Domain Surveys: Targeted Follow-Up	$316,788
07-ERD-015	Discovery of a Light Higgs Boson with b Quarks	$318,503
07-ERD-016	A New Approach to Simulating Inhomogeneous Plasmas for Inertial Fusion Energy and Other Applications	$137,470
07-ERD-017	Serrated Light Illumination for Deflection-Encoded Recording (SLIDER)	$278,072
07-ERD-019	Detection, Classification, and Estimation of Radioactive Contraband from Uncertain, Low-Count Measurements	$512,781
07-ERD-020	Dense Gas Transport in Complex Environments	$244,095
07-ERD-023	Techniques for Supernova Cosmology with the Large Synoptic Survey Telescope	$766,101
07-ERD-024	Deformation of Low-Symmetry and Multiphase Materials	$316,406

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LLNL - L. Livermore National Lab

Project ID	Project Name	FY Total
07-ERD-025	Development of Novel Antimicrobial Proteins and Peptides Based on Bacteriophage Endolysins	$312,528
07-ERD-027	Knowledge-Based Coreference Resolution	$229,850
07-ERD-028	Advanced Computational Techniques for Uncertainty Quantification	$248,945
07-ERD-029	Electronic Anomalies in Ordered and Disordered Cerium at High Pressures and Temperatures	$463,733
07-ERD-034	Plasticity at High Pressures and Strain Rates using Oblique-Impact Isentropic-Compression Experiments	$129,024
07-ERD-035	VidCharts: Real-Time Algorithms for Large-Scale Video Analysis, Compression, and Visualization	$478,795
07-ERD-041	Ultraviolet-Visible Resonance Raman Studies of High Explosives, Impurities, and Degradation Products for Enhanced Standoff Detection	$276,247
07-ERD-042	Standing-Wave Probes for Micrometer Scale Metrology	$183,869
07-ERD-045	Salicylic Acid Derivatives: A New Class of Scintillators for High-Energy Neutron Detection	$254,387
07-ERD-046	Development of Novel Transgenic Technologies to Study Genome Regulation and Architecture	$453,396
07-ERD-047	Investigation of Double-C Curve Behavior in the Plutonium-Gallium Time-Temperature-Transformation Diagram	$243,406
07-ERD-048	Quantum Properties of Plutonium and Plutonium Compounds	$664,605
07-ERD-049	Controlling the Structure of a Quantum Solid: Hydrogen	$204,104
07-ERD-053	Microarrays + NanoSIMS: Linking Microbial Identity and Function	$279,757
07-ERD-055	Ultrahigh-Velocity Railgun	$439,962
07-ERD-057	Software Security Analysis	$505,056
07-ERD-061	Verification and Validation of Radiation Hydrodynamics for Astrophysical Applications	$80,327
07-ERD-063	Storage-Intensive Supercomputing	$493,358
07-ERD-064	Fossil Fuel Emission Verification Capability	$432,881
07-ERI-002	Accelerator Mass Spectrometry of Strontium-90 for Biomonitoring and Human Health	$265,096
07-ERI-004	A Plasma Amplifier toward Zettawatt Laser Powers	$272,792
07-ERI-005	Cosmochemical Forensics	$255,133
07-LW-037	Uncovering Supersymmetric Leptons at the Large Hadron Collider	$154,830

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LLNL - L. Livermore National Lab

Project ID	Project Name	FY Total
08-ERD-001	Dynamics of Material Motion and Transformation following Localized Laser-Energy Deposition in Transparent Dielectrics	$638,530
08-ERD-002	A New Selectable Marker System for Genetic Studies of Select Agent Pathogens	$338,602
08-ERD-005	Nonequilibrium Electron Dynamics in Warm Dense Matter	$165,974
08-ERD-006	Tailored Ceramics for Lasers	$240,741
08-ERD-008	Studying Reactions on Excited Nuclear States	$294,650
08-ERD-014	New Algorithms to Scale Domain Decomposition Up to Blue Gene Architectures	$266,285
08-ERD-016	Broadband Heterodyne Infrared Spectrometer: A Path to Quantum Noise-Limited Performance	$257,449
08-ERD-017	Exploration of Laser-Plasma Interactions for High-Performance Laser-Fusion Targets	$458,646
08-ERD-018	Towards a Universal Description of Nuclei with Monte Carlo Methods	$276,202
08-ERD-019	Innovative Divertors for Future Fusion Devices	$210,295
08-ERD-020	The Elegant Molecular Syringe: Characterizing the Injectisome of the Yersinia pestis Type III Secretion System	$200,903
08-ERD-022	Robust Ensemble Classifier Methods for Detection Problems with Unequal and Evolving Error Costs	$122,501
08-ERD-023	Enhanced Event Extraction from Text Via Error-Driven Aggregation Methodologies	$408,391
08-ERD-024	High-Temperature Thermal X-Radiation Sources at Short-Pulse Lasers	$479,370
08-ERD-025	Viability-Based Detection Methods for Pathogens in Complex Environmental Samples	$276,184
08-ERD-026	Scalable Methods for SN Transport on Massively Parallel Architectures	$610,095
08-ERD-027	Advanced Computation and Experimental Analysis of Plasma Equations of State and Transport	$236,785
08-ERD-030	Rapid Radiochemical Separations for Investigating the Chemistry of the Heaviest Elements	$500,423
08-ERD-031	Efficient Numerical Algorithms for Vlasov Simulation of Laser-Plasma Interactions	$587,629
08-ERD-032	Fundamental Mechanisms Driving the Amorphous-to-Crystalline Phase Transformation	$319,824
08-ERD-033	Strain-Rate Effects on Plasticity and Defects	$141,768

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LLNL - L. Livermore National Lab

Project ID	Project Name	FY Total
08-ERD-034	New Physical Mechanisms for Next-Generation Fusion-Laser Dynamic Sensors and Diagnostics	$331,967
08-ERD-035	Impurity and Alloying Effects on Material Strength from First Principles	$385,948
08-ERD-036	Understanding Viral Quasispecies Evolution through Computation and Experiment	$463,339
08-ERD-037	Important Modes to Drive Protein Molecular-Dynamics Simulations to the Next Conformational Level	$102,308
08-ERD-038	Do Brittle Metals Change Character under Extreme Shock Conditions?	$389,448
08-ERD-039	Direct Simulation of Dynamic Fracturing during Carbon Storage and Prediction of Potential Storage Failures	$211,193
08-ERD-042	A Hydrogen-Oxygen-Argon Internal Combustion Engine System: The Mechanical Equivalent of a Fuel Cell	$241,032
08-ERD-043	Tracing the Shadows of Planetary Systems	$592,629
08-ERD-044	Point-of-Care Diagnostic for Foot-and-Mouth Disease Virus	$206,348
08-ERD-046	Linking Quantum Chromodymamics to Experimental Data	$418,066
08-ERD-048	Three-Dimensional Plus Time Analysis of Plasma Microturbulence Simulations	$163,567
08-ERD-049	Cryogenic Bolometers for Double Beta-Decay Experiments	$157,976
08-ERD-051	Cadmium-Zinc-Telluride Sandwich Detectors for Gamma Radiation	$330,429
08-ERD-052	Partition-of-Unity Finite-Element Method for Large-Scale Quantum Molecular Dynamics on Massively Parallel Computational Platforms	$224,144
08-ERD-053	High-Resolution Projection Microstereolithography for Advanced Target Fabrication	$500,537
08-ERD-054	Measurement and Prediction of Laser-Induced Damage in the Presence of Multiple Simultaneous Wavelengths	$2,160,117
08-ERD-055	Chemical and Structural Modification and Figure Control during Glass Polishing	$2,014,030
08-ERD-056	Toward More Intrinsically Secure Nuclear Fuel Cycles	$424,662
08-ERD-057	Physics of Local Reinitiation and Morphological Evolution of Mitigated Sites for Ultraviolet Optics	$2,243,021
08-ERD-062	Mesoscale Studies of Hydrodynamic Instability Growth in the Presence of Electric and Magnetic Fields	$416,556
08-ERD-064	Hybridization, Regeneration, and Selective Release of DNA Microarrays	$397,286
08-ERD-065	Coordinated Analysis of Geographic Indicators for Nuclear-Forensic Route Attribution	$279,891

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LLNL - L. Livermore National Lab

Project ID	Project Name	FY Total
08-ERD-066	Nuclear Astrophysics at the National Ignition Facility: Feasibility of Studying the Reactions of the Stars on Earth	$166,264
08-ERD-067	Hierarchical Vehicle Activity Models for Site Security	$406,258
08-ERD-069	Study of Kelvin¿Helmholtz Instability in High-Energy-Density Hydrodynamic Processes	$144,938
08-ERD-070	An Experimental and Theoretical Approach to Visualize Dechlorinating Bacteria in Porous Media	$311,627
08-ERD-071	New Molecular Probes and Catalysts for Bioenergy Research	$269,950
08-ERI-002	X-Ray Scattering on Compressed Matter	$268,372
08-ERI-004	Proton Fast Ignition	$288,990
08-LW-004	Conductivity in Warm Dense Matter	$354,226
08-LW-015	Probing the Organization of the Cell Membrane	$218,092
08-LW-025	Regulation of Yersina Pestis Virulence by Autoindicer-2-Mediated Quorum Sensing	$219,248
08-LW-027	Bacteria-Mineral Interactions on the Surfaces of Metal-Resistant Bacteria	$225,003
08-LW-052	Zero-Order Phased Fiber Arrays	$225,691
08-LW-058	Relativistic Electron-Positron Jets	$312,701
08-LW-068	Kinetics of Weakly Fluctuating Crystal Surfaces: Beyond Classical Concepts	$229,446
08-LW-070	Plasma Waveguide for Electron Acceleration	$340,359
08-LW-100	Prediction of Patient Response to Chemotherapy using Drug Microdosing	$227,488
08-SI-001	Fast-Ignition Proof-of-Principle Experiments	$2,784,085
08-SI-002	The Viral Discovery Platform	$2,222,681
08-SI-004	Nanomaterials for Fusion Application Targets	$2,418,106
09-ERD-002	Nanosecond Characterization of Dynamic Void Evolution in Porous Materials	$404,921
09-ERD-003	Understanding the Surface Properties That Lead to Optical Degradation in High-Fluence, High-Average-Power Optical Materials	$818,440
09-ERD-004	Improved Spectral Line Shape Models for Opacity Calculations	$325,286
09-ERD-005	Multiresolution Adaptive Monte Carlo for Microstructure Simulations	$395,218
09-ERD-009	Coupling Advanced Cryo-Electron Microscopy with High-Performance Computing to Resolve Biomolecular Function	$398,444
09-ERD-012	First-Principles Planetary Science	$247,685
09-ERD-014	Quantitative Analysis of Vector Field Topology	$432,070

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Laboratory, Plant or Site Directed Research and Development Report
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LLNL - L. Livermore National Lab

Project ID	Project Name	FY Total
09-ERD-016	Imaging X-Ray Line Shape Diagnostic for Burning Plasmas	$390,370
09-ERD-017	Rapid Exploitation and Analysis of Documents	$119,070
09-ERD-019	Adding Validation and Novel Multiphysics Capabilities to the First-Principles Molecular Dynamics Qbox Code	$307,674
09-ERD-020	How Carbon and Oxygen Can Be Made in Stars: An Ab Initio Approach to Nuclear Reactions	$251,040
09-ERD-021	Role Discovery in Dynamic Semantic Graphs	$403,714
09-ERD-023	Ultrafast Nanoscale Dynamic Imaging Using X-Ray Free Electron Lasers	$305,238
09-ERD-025	Scrape-Off Layer Flow Studies in Tokamaks	$326,078
09-ERD-026	Collection of Refractory Debris from the National Ignition Facility for Stewardship-Relevant Measurements	$297,992
09-ERD-028	Understanding the Initiation of High-Voltage Vacuum Insulator Flashover	$463,486
09-ERD-029	Enabling Transparent Ceramics Optics and Advanced Armor with Nanostructured Materials Tailored in Three Dimensions	$289,454
09-ERD-030	Critical Enabling Issues for Burning-Plasma Diagnostics	$172,939
09-ERD-032	Experimental Determination of Dense Plasma Effects on Bound States in Extreme States of Matter	$758,643
09-ERD-034	Modern Finite Elements for Lagrangian Hydrodynamics	$552,969
09-ERD-036	Uses of Ignition at the National Ignition Facility	$298,595
09-ERD-037	Shock Temperatures from Neutron Resonance Spectroscopy	$280,533
09-ERD-038	Improving Atmospheric Flow Prediction at Intermediate Scales	$209,502
09-ERD-042	Arc Initiation of High Explosives	$310,319
09-ERD-044	Lagrange Multiplier Embedded Mesh Method	$250,640
09-ERD-045	Optimized Volumetric Scanning for X-Ray Area Sources	$172,539
09-ERD-046	Dynamic Simulation of Processes and Conditions Affecting Cavity Growth during Underground Coal Gasification	$254,312
09-ERD-049	Magnetorheological Finishing for Large-Aperture High-Fluence Optical Applications	$1,161,017
09-ERD-050	Characterization of Tritium Uptake and Release by Inertial Confinement Fusion Reactor Materials	$1,171,165
09-ERD-051	Methods for Mitigation of Damage to Multilayer Mirrors	$837,789
09-ERD-052	Ultrasensitive Rare-Event Detection for Global Nuclear Security	$890,333
09-ERD-053	Petascale Computing-Enabling Technologies	$871,313

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LLNL - L. Livermore National Lab

Project ID	Project Name	FY Total
09-ERD-054	Flexible and Rapid Therapeutic Countermeasures for Global Biosecurity	$1,920,194
09-ERD-055	Regional Climate Change Prediction for the Twenty-First Century	$1,163,449
09-ERD-056	"Day One" Nuclear Forensics	$876,138
09-ERD-057	Maskless, Low-Cost, High-Performance Polymer Waveguides	$124,447
09-ERD-058	Advanced Computational Techniques for Improving Space Flight Safety	$462,882
09-ERI-002	Biological Testing of Systems Biology: Validation of Flux-Balance Analysis Predictions	$205,534
09-ERI-003	Mapping Patterns of Past Drought in California: Late-Holocene Lake Sediments as Model Diagnostics	$228,310
09-ERI-004	Stardust Science: Nanoscale Analytical Studies of Materials	$377,059
09-FS-002	Laser-Based Comminution of Debris Samples for Post-Detonation Forensics	$123,298
09-FS-003	Epidemic Disease Response and Impact Simulation	$108,556
09-FS-004	Latent Heat Reservoirs for Thermal Management of Laser Diode Pumps	$72,822
09-FS-005	Assessing the Feasibility of Alternative Inertial-Confinement Fusion Approaches	$74,834
09-LW-003	Superimposed Plasmonic and Photonic Detection Platform	$279,199
09-LW-024	Biomolecule Directed Synthesis of Highly Ordered, Nanostructured Porous Zinc Oxide	$319,724
09-LW-030	Towards Understanding Higher-Adaptive Systems	$268,691
09-LW-036	The Role of Dendritic Cells in Tularemia Pathogenesis	$302,371
09-LW-044	An Atomic Inner-Shell X-Ray Laser Pumped by the Linac Coherent Light Source	$213,023
09-LW-061	Direct Search for Decay of the Thorium-229 Nuclear Isomer	$243,798
09-LW-072	Effect of Aging on Chondrocyte Function	$245,488
09-LW-077	Versatile Delivery and Immune-Stimulatory Platform for Just-in-Time (JIT) Vaccine Development	$253,586
09-LW-080	Investigation of Short-Pulse Laser-Pumped Gamma-Ray Lasers	$251,755
09-LW-104	Natural Perchlorate in Groundwater: Source, Formation Mechanisms, and Fate	$254,025
09-LW-112	Antibiotic Heteroresistance in Methicillin-resistant Staphylococcus aureus: Microchemostat Studies at the Single-Cell Level	$261,129
09-SI-003	Radiation Tolerant Materials	$2,300,429
09-SI-004	Precision Mono-Energetic Gamma-Ray Science for NNSA Missions	$2,992,657

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LLNL - L. Livermore National Lab

Project ID	Project Name	FY Total
09-SI-005	Physics and Chemistry of the Interiors of Large Planets: A New Generation of Condensed Matter	$2,166,844
09-SI-010	From Super-Earths to Nucleosynthesis: Probing Extreme High-Energy-Density States of Matter with X-Rays	$1,800,154
09-SI-011	The Micro-Physics of Burning, Hot Dense Radiative Plasmas	$2,192,851
09-SI-013	Supercomputing-enabled Transformational Analytics Capability (SETAC)	$2,759,121

Total # of Projects for LLNL: **169** **Total Cost for LLNL:** **$85,099,460**

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NREL - National Renewable Energy Lab

Project ID	Project Name	FY Total
06001001	LDRD Program Management	$0
06001010	LDRD Costs on Closed Projects	$-4,770
06001099	LDRD Peer Reviews	$8,627
06270701	Design, Synthesis, and Characterization of Plasmonic Structures for Solar Energy Conversion and Solid-State Lighting	$193,189
06270702	Developing Next Generation Concepts for Consolidated Bioprocessing Microorganisms Using Systems Biology	$165,665
06270703	Two-Electron Catalysis Coupled to Excitonic Semiconductors: Nanostructured PhotoElectroCatalytic Systems	$165,039
06270704	Isolation and Separation of Single-Walled Carbon Nanotubes(SWNTs)via Engineered Proteins	$40,226
06270705	Novel in vitro Hydrogenase-Dependent Production of H2 Coupled Directly to Light-Induced Charge Separation Using Only Photosystem	$91,694
06270801	Oriented Nanotube Arrays for Advanced Lithium-Ion Batteries	$200,521
06270802	Tailoring Carbon Nanotube and Hydrogenase Bio-Hybrids for Design of Novel H2 Electrodes	$156,429
06270803	Catalyst Improvement for Solar Biohydrogen Production	$182,725
06270804	Understanding Plant Cell Wall Deconstruction Process in Biomass Decaying Community using Proteomics and Bioimaging Approaches	$162,577
06270901	Biodiesel from Cyanobacteria	$121,494
06270902	A Fundamental Investigation of the role of Triplet States in Organic Photovoltaic Materials	$215,155
06510701	Consolidated Bioprocessing (CBP)of Cellulosic Biomass: Physiologically Paired Microbial Hosts and Cellulase Enzymes	$150,206
06510801	Obtaining Cell Wall Composition of a Single Cell: Integration of Pulsed Sample Introduction with High Sensitivity Laser Ionization Mass Spectrometry	$186,352
06510802	Nanoscale Materials for Thermal Storage	$202,365
06510803	Developing Next Generation Biobutanol-Producing Microorganisms Using Systems Biology	$175,760
06510804	Meso-Scale Computational Modeling of Polysaccharides in Plant Cell Walls	$156,639
06510805	Development of a Comprehensive High-Throughput Technique for Assessing Lipid Production in Algae	$170,440
06510901	Use of Digital Gene Expression: TAG Profiling for High Throughput Transcriptomics in Microbial Strains Involved in Advanced Biofuel Production	$43,738
06520601	Thin-Film Microelectronics for Rapid Gene Expression Analysis	$126,236

NREL - National Renewable Energy Lab

Project ID	Project Name	FY Total
06520603	A Critical Examination of the Intermediate Band Concepts for Ultra-High Efficiency Quantum Dot Solar Cell	$15,551
06520604	Modified Inorganic Nanostructures for Organic Photovoltaics	$9,119
06520801	Semiconducting and Metallic Nanowire Networks for Transparent Electrical Contacts	$171,248
06520802	Integrated Rectenna Devices for Solar Energy Conversion	$227,951
06520901	Understanding the Solid Electrolyte Interface for Advanced Transportation Batteries	$8,867
06540801	Development of Vehicle to Grid (V2G) Systems to Support Renewable Technologies	$218,496
06540901	Nano-Scale Control of Thermal Transport in Novel Materials/Nanostructures	$96,661
06550701	Development of Self-Learning Building Controls with Initial Application for Lighting Control	$134,268
06560801	Solid Oxide Fuel Cells for Combined Tar Reforming and Electricity Production	$182,277
06560901	Novel Support and Innovative Structured, Low Loading Catalyst Layer for Proton Exchange Membrane (PEM)Fuel Cells	$119,922
06590701	Designing New Materials for Water Splitting from Solid Solutions of Semiconductor Compounds	$196,820
06590802	Development of Novel Thin-Film Solar Energy Conversion Materials	$171,114
06590901	Solid-State Proton Conductor for a Hydrogen Battery	$145,741
06590902	Simulation Strategies for Organic, Excitonic and Third-Generation Solar Cells	$132,869
06670901	Analytical Science for Geospacial and Temporal Variability in Renewable Energy and Energy Efficiency	$110,872
06RF0701	Properties of Refractory Metal Doped Transparent Conducting Oxides	$-7,605
06RF0703	New Microbial Biohydrogen Research Approaches	$15,230
06RF0704	Exploration of Novel Optimization Techniques for Identifying Materials with Prescribed Physical Properties	$9,213
06RF0801	Time-Resolved Microwave Conductivity Function Temp	$3,874
06RF0901	Development of a System for Synthesizing Si Quantum Dots	$84,171
06RF0902	The Science of Sustainability	$86,247
06RF0903	Band Edge Engineering in ZnO	$80,818
06RF0904	Time Resolved Microwave Conductivity Functions	$61,595

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NREL - National Renewable Energy Lab

Project ID	Project Name	FY Total
06RF0905	Immobilization Approaches for Improving Algal H2 Photoproduction	$84,805
06RF0906	Marine Hydrokinetic Renewable Energy Research	$94,398
06RF0907	Theoretical Approach Towards the Understanding of the Electronic Structure of Mixed Metal Oxides for Photoelectrochemical Water Splitting	$108,327
06RF0908	Development of New Theoretical Methods for Searching Optimized Materials for Solar Conversion	$110,456
06RF0911	Solexa Studies	$16,924

Total # of Projects for NREL: 50 **Total Cost for NREL: $5,600,536**

United States Department of Energy
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Project List -- Fiscal Year 2009

NTS - Nevada Test Site

Project ID	Project Name	FY Total
H1701039	Collimating Coded Aperture for Point Source Detection	$224,928
H1701049	Debye-Waller Dynamic Temperature Measurements	$212,669
H1701079	Exploring Phase Transition/Shock Dynamics with THz Spectroscopy	$161,055
H1701119	Picosecond Time-resolved Electron Diffraction of Phase Transitions	$190,393
H1701138	Optimized Scintillator Geometry	$159,204
H1701208	Time-Dependent Neutron Imaging on a Dense Plasma Focus	$-715
H1702019	Dark Field Radiography	$136,000
H1702028	Terahertz Time-Domain Spectroscopy (THz-TDS) and Imaging	$-708
H1702079	Neutron Imaging Calibration	$215,947
H1702088	A miniature dual use streaking camera and photodetector	$-9
H1702109	THZ DPF PLASMA PROBE	$429,149
H1702168	RADOPTIC SENSORS (PHASE 2)	$2,134
H1703057	Zero Wind Plume Model	$-6,917
H1703058	High Band-pass PMT Development	$-63
H1703078	Many Point Velocimetry using Heterodyne Techniques	$8,046
H1703089	High Explosive Pulsed Power DPF	$225,083
H1703118	DPF LOAD FOR ATLAS	$7,561
H1703129	COAXIAL DPF	$208,744
H1703148	Design of Neutron Resonance Spectroscopy Exp.	$-8,922
H1703428	Detection of Chlorine Gas	$1,563
H1704038	Wavelet Optimization for Detection and Spectral ID	$-466
H1704119	CeBr3 Room Temperature High Resolution Detector	$194,701
H1704158	CeBr3 as a Room Temperature High Resolution Gamma-Ray Detector	$-21,233
H1704168	Handheld Neutron Spectrometer	$-15,046
H1704248	Dual neutron-gamma detectors as neutron energy spectrometers	$158
H1704249	Portable Tagged Neutron Triple Coincidence Counter System	$230,889

United States Department of Energy
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NTS - Nevada Test Site

Project ID	Project Name	FY Total
H1704307	Field Testing a Gamma-Ray Telescope for Search and CM Missions	$2,804
H1704339	WAVELET ADAPTIVE LEARNER	$128,491
H1704368	Concealed Directional Detector Phase II	$7,059
H1704409	Interpreting Rad Measurements using Adjoint Transport	$118,047
H1704539	SNM End-Of-Enrichment (EOE)Time and Constituency Reconstruction	$189,383
H1704618	Advanced Microwave Antenna Array and Multiband Receiver	$251,822
H1705018	Frequency modulated detection of phosphorescence surfaces	$1,803
H1705058	Radiative decay engineering for improved scintillators	$4,952
H1705069	Radiative Decay Engineering for Improved Scintillators	$186,354
H1705089	RAMAN AEROSOL CYTOMERY	$211,241
H1705109	Differential Mobility Spectrometry Mass Spectrometry	$186,091
H1705119	BROADBAND SPECTRAL Ellipsometer	$166,309
H1705128	Fiber bragg grating shock sensors	$36
H1705179	Hybrid Colloidal Quantum Dot AlGaN-based Photodetectors	$189,172
H1705189	FOURIER TRANSFORM SPECTROMETER	$127,071
H1705209	DFT Computations for Uranium Chemistry	$114,603

Total # of Projects for NTS: **42** **Total Cost for NTS:** **$4,439,383**

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report
Project List -- Fiscal Year 2009

ORNL - Oak Ridge National Lab

Project ID	Project Name	FY Total
32102237	Fundamental Studies of CO2-Coal Interactions using Novel, Neutron Scattering Techniques at Conditions Relevant to Subsurface Sequestration	$51,378
32102240	An Innovative Low/High-Temperature, Repetitive Pressure-Pulse Apparatus for Cavitation Damage Research	$109,697
32102241	Computing the Electric Dipole Moment of the Neutron and the Schiff Moment of the Nucleus	$24,475
32102244	Quantitative Imaging of Subcutaneous Veins with Multispectral Illumination and Three-Dimensional Modeling	$40,876
32102245	Real-Time Quantitative Phase and Fluorescence Biological Microscopy by Digital Holography	$48,594
32102248	Atomic-Level STEM Imaging of Bias-Induced Phase Transformations: Applications to Information Technology	$113,269
32102251	Tracing Nanoparticle Transport in Porous Media by Neutron Radiography and Small-Angle Neutron Scattering	$39,953
32102252	D of a Novel Sensor System for Biomarkers of Physiological and Pathological Processes in Biomedicine	$47,491
32102254	Nano Mat'ls:Enhanced Radiometric Forces	$34,837
32102256	Electron Transport @ Nanoscale	$25,505
32102257	All-Optical Plasmonic Pump:Integrated Ap	$39,537
32102259	Dev of Device:Low-Cost, In-Reactor Load	$25,575
32102261	Dev of Inorganic Membranes 4 Water Recl	$80,694
32102262	New Method for Controlling Densification	$95,867
32102265	Hydration-Driven Processes in Bioenergy	$90,181
32102266	Novel High Power Cathodes for Lithium-Io	$93,634
32102267	Novel IR-Processed Titanium Composition	$66,982
32102268	Tip Enhanced Optical Assembly of Plasmon	$110,071
32102269	Novel Method to Achieve High-Resolution	$138,279
32102272	Laser-Enhanced, Nanoscale Focused, Elect	$99,694
32102273	Actuation & Control of Wearable Robotics	$57,988
32102274	Surface Interactions of Radioactive Part	$115,756
32102276	The GPU-Enhanced Computer for Lg Scale T	$136,841
32102277	D of a Microfluidic Device	$93,017
32102278	Novel, Hf-Doped AI203 Permeation Barrier	$99,885

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ORNL - Oak Ridge National Lab

Project ID	Project Name	FY Total
32102279	Novel Method for 3D Depth Resolved Imagi	$124,889
32102280	Nonlinear Nanomechanical Oscillators	$159,483
32102281	In situ Neutron Imaging of Roots	$16,885
32102282	Ordered Nanoporous Hyperadsorptive Perco	$147,135
32102283	Optical Resonance Disk-Based Infared The	$154,974
32102284	Fabrication of Single Crystal Thin Film	$154,483
32102285	Neutron Scattering Characterization of Sol-Gel Drug Delivery Systems	$149,370
32102286	Cell-Borne Chip for Controlled Therapeutic Protein Production and Delivery	$174,975
32102287	The D of a New Field of Organic-Based, High-Temperature, Heat Transfer Fluids	$74,349
32102288	D of an Advanced Light Water Reactor Analysis Capability	$173,502
32102289	Lu2O3-Based Transparent Polycrystalline Ceramic Scintillators: A New, High-Density Inorganic Scintillator for Improved Positron-Emission Tomography	$174,823
32102290	Nanoporous Inorganic Membranes for High-Efficiency Organic Separations	$101,772
32102291	Dissolution of Monoglyceride Precipitants in Biodiesel by the Application of Microwave and Ultrasonic Energy	$27,848
32102292	Advanced Variance Reduction Methods for Active Interrogation Modeling	$39,835
32102293	Whole-Community Proteomic Characterization of Synthetic Human Gut Microbiomes in Gnotobiotic Mice	$126,087
32102294	Integration of Analytical Imaging Methods	$20,429
32102295	D of Computational Methods for Neurobiological Imaging Research	$119,884
32102296	Investigation of Ionic-Liquid Attachment to Charged-Carbon Electrodes by Surface-Enhanced Raman Spectroscopy for Energy Storage	$27,420
32102297	Luminescence of Levitated Individual Semiconductor and Noble-Metal Nanoparticles	$174,594
32102298	Study of Radio Frequency Critical Magnet	$112,670
32102299	An Ionic Liquids-Based Ion Detector	$117,855
32102300	Remote Microfluidic Platform Using Smart	$99,406
32102301	The Effect of Nanoscale Confinement on P	$63,923
32102302	32102302 Ecological Effects of Fly Ash	$28,744
32102303	Passive Coded-Aperture Imaging of Fission-Spectrum Neutron Sources	$27,766

ORNL - Oak Ridge National Lab

Project ID	Project Name	FY Total
32102304	Dual Waveband Passive Longwave Infrared (LWIR) Uncooled Imager	$80,721
32102305	Comparison of ORNL Plasma Arc Lamp Decontamination to Existing U.S. Air Force Aircraft Decontamination Procedures	$24,605
32102306	D of a Machinable BN-SiC Ceramic Composite Compatible with High-Temperature Molten Fluoride Salts	$44,922
32102307	DNA Separation Using Electrophoretic Tra	$22,590
32102308	Investigate the Feasibility of Increasing the Thermal Conductivity of UO2 through the Addition of High Thermal Conducting Material in Order to Improve the Performance	$42,365
32102309	Nanoparticle-Hydrogel Sensors for Trace Detection of Explosives in Groundwater	$10,022
32102310	A Nonlinear Plasmonic Nano-Circuit for Data Communications	$19,906
32112193	An Evolutionary Framework for Porting Applications to Petascale Platforms	$48,973
32112194	A Robust Polymer Scaffold System for Bio-Inspired Membranes	$54,655
32112196	Probing Molecular Interaction Between Microbial-Cell Protein and Mineral Surfaces With Neutrons	$66,948
32112197	Systemic Approaches in Recombinant Zymomonas mobilis to the Regulation of Ethanol Fermentation	$29,967
32112198	Unraveling the Regulatory and Biosynthetic Genes that Control Cellulose Production in the Model Bioenergy Crop Populus	$26,930
32112199	High-Throughput Neutron Crystallography for Macromolecular Structure, Function, and Design	$49,528
32112200	Magnetic Structure Under Simultaneous Ultrahigh-Pressure and High-Temperature Conditions: 200 kbar and 1500 K	$52,675
32112204	Fundamental Mechanisms of Self-Assembly of Ordered Nanostructures in Heterogeneous Ceramic Materials	$57,448
32112207	Energy Flow and Conversion on the Molecular Level: A View at Molecular Photoelectromechanical Machines	$114,446
32112215	Electricity and Biohydrogen Production via a Systems-Level Understanding of Microbial Fuel Cells	$186,110
32112216	Smart Materials Toward a New Paradigm of Super-Efficient Separations Using only Energy Input: Conformational Switching Based on Magnetic Nanoparticles	$50,131
32112221	Nanostructured Thermoelectrics for Power Generation: Smaller is Cooler	$30,060
32112222	Microfluidic Platform for Individual Microbe Capture, Cultivation, and Selective Release	$395,720

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ORNL - Oak Ridge National Lab

Project ID	Project Name	FY Total
32112223	Methodological D of Computer Simulation in Molecular Biophysics	$322,971
32112224	D of a Global Advanced Nuclear Fuel Rod Model	$122,187
32112226	Molecular-Fragment Database for De Novo Structure-Based Design	$49,656
32112228	Structure of Fluids Confined in Nanoporous Materials using Neutron Scattering	$49,406
32112229	Neutron Scattering Study of Magnetic and Spin Dynamic Behavior in Amine-Stabilized Transition Metal and Transition Metal Oxide Nanoparticles	$337,853
32112230	Nanocomposites for Advanced Thermoelectrics	$383,411
32112231	Irradiation of Advanced Light Water Reactor Fuel in the High Flux Isotope Reactor	$478,823
32112232	Rotating Solid Target Design D for SNS	$292,116
32112233	Pushing the Limits: High-Impact Neutron Protein Crystallography	$218,735
32112234	Single Molecular Imaging and Spectroscopy of Adsorbed Molecules	$300,589
32112235	Preparing for New Programming Languages for Ultrascale Applications	$328,718
32112236	A Petascale Parallel Programming Environment for Scientific Software	$270,407
32112237	Global Climate Feedbacks and the D of Biofuel Climate Scenarios	$270,964
32112238	Neutron Structural Virology	$332,618
32112239	Overcoming the Barrier to Ultrascale Climate Simulation	$229,555
32112240	Cost and Effectiveness of Fault Tolerance in Quantum Computing	$300,665
32112241	Bandgap Narrowing of Oxide Semiconductors Using Noncompensated n-p Co-Doping for Enhanced Solar Energy Utilization	$264,890
32112242	Host Genetic Diversity as a Variable Selection Environment for the Gut Microbiome	$483,562
32112243	Automated Freeform Construction Technologies and Materials	$433,738
32112244	Nanostructured Mesoporous Photocatalysts for CO2 Reduction	$286,511
32112245	Scale-Dependent Metrics for Bioenergy: Land-Nutrient-Water Interactions under Future Energy Scenarios	$343,378
32112246	Possible Impacts of Relatively Severe Climate Change	$240,585
32112247	Novel Alternative Signatures for Radiation Detection	$299,774
32112248	High-Performance Proton-Conducting Fuel Cell Electrolytes Based on Task-Specific Protic Ionic Liquids	$296,891
32112249	Supra-Macromolecular Assembly of Artificial Photoconversion Units	$230,470
32112250	Inelastic Neutron Scattering from Magnetic Heterostructures	$135,875

ORNL - Oak Ridge National Lab

Project ID	Project Name	FY Total
32112251	Synthesis, Assembly and Nanoscale Characterization of Confined, Conjugated and Charged Polymers for Advanced Energy Systems	$304,767
32112252	A Knowledge Discovery Framework for America's Transportation System	$285,822
32112253	Manufacturable Nanotransistors for Advanced Analog Circuits	$343,523
32112254	Imaging of Molecular Structure and Electron-Driven Dynamics	$199,125
32112255	Ultrascale Computing/Neutron Scattering	$300,689
32112256	Revolutionary Method for Increasing Efficiency of White-Light, Quantum-Dot, Light Emitting Diodes	$349,751
32112257	An Experimental, Theoretical, and Molecular-Modeling Approach to Characterize the Structure and Dynamics of Charged PAMAM Dendrimers in Solution	$357,626
32112258	Carbon Drivers of the Microbe-Switchgrass Rhizosphere Interface	$354,300
32112259	Mapping the Protein Structure-Function-Dynamics Landscape	$203,025
32112260	Enabling Ubiquitous Info Flows:Real-time	$336,849
32112261	Design:Simulate/Prototype Fac/Macroscale	$351,310
32112262	Unmixed Combustion for High-Efficiency Energy Conversion	$349,343
32112266	Investigating the Role of Physical Inter	$214,804
32112267	Materials Behavior Underlying the Electr	$1,191,530
32112268	I Attoliter Droplets On-Demand in Nanoch	$237,342
32112269	Controlled Hierarchical Self-Assembly of Robust Organic Architectures	$233,350
32112270	Next-Generation Computational System for Biological Annotation	$296,910
32112271	Evolution and Optimization of the Biofuel Supply Chain	$336,331
32112272	D of Novel Biocatalysts for the Production of Fuels and Chemicals from Synthesis Gas	$391,105
32112273	D of Cermet High-Level Waste Forms	$390,188
32112274	A Systems Biology Approach to Study Metabolic and Energetic Interdependencies in the Ignicoccus-Nanoarchaeum System	$278,730
32112275	Investigation of Molten Salt Thermal Performance in Pebble Beds Using Unique Heating Techniques	$413,435
32112276	Under interfacial electrochemical phenom	$292,554
32112277	Spatiotemporal Data Mining Framework for Monitoring Biomass at Regional and Global Scales	$286,232

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ORNL - Oak Ridge National Lab

Project ID	Project Name	FY Total
32112278	Developing a Systems Biology Approach for Linking Genetic and Environmental Constraints to Primary Productivity in Model and Nonmodel Species	$303,029
32112279	Liquid Membrane Facilitated Solvent Extraction for Americium Separation from Spent Nuclear Fuel	$351,277
32112280	Mapping Energy Transformations Pathways and Dissipation on the Nanoscale	$248,848
32112281	Interfacial Reactions of Metal-Fluid Systems at Extreme Conditions	$303,455
32112282	Spatial modeling-geographic patt	$293,790
32112283	New Density Functionals for Ab Initio Calculations Derived from Many-Body Theory	$274,539
32112284	Variable Valve Actuation to Enable Highly Efficient Engines	$362,073
32112285	Architecture for advancing scientific co	$268,053
32112286	Design of Evanescent-Wave Power Transfer for Parked and Moving Hybrid Electric Vehicles	$342,935
32112287	Uncertainty Assessment and Reduction for Climate Extremes and Climate Change Impacts	$487,792
32112288	Multi-Photon Entangled States for Quantum Information Science	$300,067
32112289	Integrated Navigation System for GPS-Denied Environments	$150,520
32112290	Decadal Prediction of the Earth System after Major Volcanic Eruptions	$345,770
32112291	Prognostic Land-Use and Land-Cover Change for a Coupled Climate-Biogeochemistry Model.	$441,078
32112292	Dynamically Polarized samples for studyi	$206,734
32112293	Fundamental Neutron Scattering Studies of the Molecular Mobility and Interactions between Natural Porous Media and Greenhouse Gases	$224,300
32112294	Neutron Scattering and Osmotic Stress to Study Intrinsically Disordered Proteins	$345,001
32112295	A Study of Real-Space Neutron Scattering Methods	$157,564
32112296	Distributed Computational Intelligence for Active Response to Cyber-Threat	$152,616
32112297	Structure and Structure Evolution in Amorphous Materials: Fundamental Understanding of Materials Behaviors Far from Equilibrium	$261,666
32112298	Data Analytics for Medicine using Semi-Supervised Learning (DAMSEL)	$226,091
32112299	A Hybrid Continuous/Discontinuous Galerkin Formulation for Next-Generation Multiphysics Computational Fluid Dynamics Solvers	$250,616
32112300	MPI-3: Programming Model Support for Ultrascale Computer Systems	$236,515

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ORNL - Oak Ridge National Lab

Project ID	Project Name	FY Total
32112301	Computer Design and Predictive Simulation of High-Capacity, Cyclable, and Versatile Nanoporous Supercapacitors for Energy Storage Applications	$323,090
32112302	Inferring and Predicting the Social Dynamics of Groups via Psycho-Textual and Communications Flow Analysis	$324,771
32112303	High-Throughput Computational Screening Approach for Systems Medicine	$248,490
32112304	Denovo: The Next-Generation, High-Performance Computing Solver for Multiscale Nuclear Energy Transport	$327,712
32112305	Active Control of Surface Plasmonics with Ferroelectricity	$317,212
32112306	Protein Dynamics: Neutron Scattering Methodological D	$96,911
32112307	Component Modeling	$357,069
32112308	Identification of New Super-Heavy Element Z=117 using HFIR-Produced 249Bk Target Material and an Intense 48Ca Beam at Dubna	$284,545
32112309	Membrane-Based Energy Efficient Integrated Separation Processes and Systems for the Production of Biofuels	$293,784
32112310	D of a High Magnetic Field Helicon Plasma Source for Fusion Energy Materials and Component Tests	$205,625
32112311	Mitigation of Atmospheric CO2 through Management of Woody Biomass	$81,334
32112312	Rapid Radiochemistry Applications in Nuclear Forensics	$84,585
32112313	Understanding Microstructure-Mechanics Relationships of Advanced Structural Materials using High-Performance Computational Modeling and In-Situ Time-Resolved Neutron Diffract	$179,779
32112314	Design of Control Methodology for a Coherent Beam Combining of High Power Semiconductor Laser Arrays	$51,386

Total # of Projects for ORNL: **157** **Total Cost for ORNL:** **$31,195,510**

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PNNL - Pacific Northwest National Lab

Project ID	Project Name	FY Total
PN06014/1943	Combinatorial Operando Catalyst Research	$175,024
PN06036/1965	Fundamental Investigations of Heterogeneous Catalysis Using Computational Methods	$185,427
PN06058/1987	Ni-Based Molecular Electrocatalysts for Hydrogen Production/Oxidation	$49,442
PN07001/2015	A Data Virtualization Architecture	$166,910
PN07002/2016	A Geometric Framework for Multimodal Analysis of Cardiac Tissue Using Magnetic Resonance Imaging, Histopathology, and Proteomics for the Identification of Biomarkers	$75,185
PN07003/2017	A Multidisciplinary Approach to Engineer Xylose and Arabinose Utilization for Ethanol Production by Saccharomyces cerevisiae	$124,382
PN07004/2018	Accelerated Fuel-Cladding Test Methods and Tools	$112,399
PN07005/2019	Adaptive Composite Analysis for Complex Systems	$51,272
PN07007/2021	Adaptive Workflow in Data Intensive Environments	$150,148
PN07010/2024	Analysis of Functional Diversity in Microbial Communities for Organic Carbon Transformations	$102,152
PN07015/2029	Biosignature Integration for Inference of Biomarkers from Complex Systems	$259,573
PN07016/2030	Carbon Nanotube Materials for Preconcentration	$118,490
PN07020/2034	Cloud Resolving Model with Size Resolved Microphysics for Aerosol and Cloud Research	$217,955
PN07022/2036	Complex Adaptive Sensor Systems	$91,219
PN07023/2037	Counter-Current Solvent Extraction Behavior of Neptunium	$207,603
PN07030/2044	Development of a Novel Cross-Linking Reagent for High-Throughput Global Analysis of Protein Interactions	$134,719
PN07031/2045	Development of a UF6 Cylinder Integrated Portal Monitoring Capability	$234,531
PN07035/2049	Electrochemical Separations for Enhanced Safeguards Analysis	$143,552
PN07037/2051	Enhanced Explosive Signature Capture via Selective Collection and Preconcentration Chemistries	$159,863
PN07038/2052	Enhanced Isotope Ratio Measurement Capability	$21,002
PN07044/2058	Image Processing Methods Applied to the Detection of Highly Concealed Explosives	$93,103
PN07045/2059	Improved Selectivity for Explosives Detection by Ion Mobility Spectrometry	$179,106
PN07051/2065	Measurement and Modeling of Slag Critical Viscosity, Optimization of Slag Chemistry, and Refractory Degradation in Coal Gasifiers	$293,021

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Project ID	Project Name	FY Total
PN07052/2066	MeDICI - Middleware for Data Intensive Computing	$239,458
PN07059/2073	Phase Contrast X-Ray Imaging For Enhanced Explosives Detection	$139,268
PN07060/2074	Predictive Adaptive Classification Model for Analysis and Notification: Internal Threat (PACMAN-IT)	$405,211
PN07062/2076	Reagent Selection Methodology for a Novel Explosives Detection Immunoassay Approach	$160,037
PN07063/2077	Real-Time In Situ Millimeter Wave Sensors for Gasifiers	$325,428
PN07064/2078	Sensitive and Specific Detection of Explosives Using a Multiplexed Two-Dimensional Field Asymmetric Waveform Ion Mobility Spectrometry/Ion Mobility Spectrometry System	$147,880
PN07067/2081	Tactical Deployment and Management of Adaptive Agents	$502,201
PN07070/2084	The Aerosol Modeling Testbed	$350,340
PN07073/2087	Understanding Adaptation to Sudden Climate Change Impacts	$77,411
PN08001/2088	A Recycleable Switchable Solvent System for CO2 Capture from Flue Gas Streams at Ambient Conditions	$249,849
PN08002/2089	A Statistical Framework for Integrated Explosives Detection	$105,375
PN08003/2090	Adaptation of Existing Probabilistic Risk Assessments to Support Reactor Aging Management	$139,384
PN08004/2091	Advanced Materials for Capturing Lanthanides and Transition Metals from Fission Products	$99,959
PN08005/2092	Application of Imperfection Modeling to Accelerated Fuel Clad Qualification and Characterization	$89,798
PN08007/2094	Banded Multiplexed Detection of Biothreats Using Superparamagnetic Nanoparticles	$183,349
PN08009/2096	Biotemplated Synthesis of Encoded Bimetallic Nanoparticles	$175,773
PN08010/2097	Carbonate Sorbents and Enzymatic Catalysts for Carbon Dioxide Capture	$150,167
PN08012/2099	Circular or Full Polarimetric Holographic Radar Imaging for Tunnel and Explosives Detection	$195,335
PN08013/2100	CO2 Capture and Concentration Using Electrochemically Switchable Carriers	$199,559
PN08014/2101	Computational Capabilities for Storage, Management, and Utilization of Large Data Volumes	$87,262
PN08015/2102	Correlation Layers for Information Query and Exploration (CLIQUE)	$174,273
PN08016/2103	Delivery of Calcium Polysulfide to Hanford Deep Vadose Zone for Cr(VI)/Tc-99 Remediation	$65,044

PNNL - Pacific Northwest National Lab

Project ID	Project Name	FY Total
PN08017/2104	Developing a Generic Numerical Module for Simulating the Transport of Gas with Multiple Components for the Design and Safe Implementation of In Situ Gaseous Reduction Remediation	$59,822
PN08018/2105	Development and Understanding of Nanostructured Materials for Advanced Energy Storage	$330,470
PN08018/2105A	Advanced Nuclear Magnetic Resonance Characterization of Energy Storage Materials	$188,051
PN08018/2105B	Multiscale Charge and Ion Transport Simulations for Nanostructured Electrodes	$191,179
PN08019/2106	Development of a Ballistic Electron Microfabricated Cathode	$141,542
PN08020/2107	Development of a Computational Fluid Dynamics Capability as a Tool for Exploring Atmospheric Processes	$60,007
PN08022/2109	Development of Core Informatics Analysis Tools for Confident Protein Identification and Quantitation	$217,280
PN08023/2110	Development of Gaming Technology for Cognitive Enhancement in Predictive Analytics	$224,027
PN08025/2112	Development of O-18 Isotope Ratio Measurements of Uranium Oxides and Surface Metal Oxides for Forensic Analysis	$136,158
PN08026/2113	Dissolution of Actinides under Oxidizing Conditions for Nuclear Energy Applications	$202,187
PN08027/2114	Dynamic Scenarios for Organizations in Infrastructures	$236,133
PN08028/2115	Electrolyte Development for Next Generation of Lithium Ion Batteries	$161,517
PN08031/2118	First Operation of a Novel, High-Mass Detector as a Weakly Interacting Massive Particle (WIMP) Dark Matter Detector	$130,600
PN08032/2119	Fundamental Understanding of Carbohydrate Catalysis in Ionic Liquids	$412,924
PN08034/2121	High Performance Data Analysis Pipeline for Online Smart Mass Spectrometry	$185,073
PN08035/2122	Hybrid Computing Solutions Applied to feature Extraction, Characterization, Classification, and Clustering	$787,976
PN08036/2123	Instrument Control for the "Next Generation" Proteomic Measurement Capabilities	$130,371
PN08037/2124	Intelligent Compression and Data Organization for Multidimensional Data Volumes	$144,869
PN08038/2125	Interactive Visual Content Analysis of Real-Time Data Streams	$195,571
PN08040/2127	Ion Beam-Nanoparticle Interactions for Radiation Detection	$139,756
PN08042/2129	Iterative Modeling of Host-Pathogen Interactions	$100,162

PNNL - Pacific Northwest National Lab

Project ID	Project Name	FY Total
PN08043/2130	Knowledge Encapsulation Framework	$218,437
PN08045/2132	Leak Rate Measurements for Prototypic Pressurized Water Reactor Primary Water Stress Corrosion Cracks	$79,317
PN08046/2133	Machine Learning String Tools for Operational and Network Security	$290,739
PN08047/2134	Managing Complexity of High-Volume Predictive and Adaptive Network Operations	$150,459
PN08048/2135	Metal Beta-Diketonate Polymers for Selective Concentration of Explosives	$130,683
PN08050/2137	Modeling Nanoparticle-Cell Interactions	$177,155
PN08051/2138	Modeling of Microbial Communities in Soil Aggregates	$149,936
PN08052/2139	Modular Network Modeling of Inflammatory Pathways	$99,369
PN08053/2140	Module-Based Analysis of Autocrine and Paracrine Cell Signaling	$199,921
PN08054/2141	Multicomponent Assembly to Achieve Charge Separation and Transport for Energy Conversion	$303,610
PN08055/2142	Nano and Micro-Engineered Solid Adsorbent for Rapid CO2 Capture and Regeneration	$257,669
PN08057/2144	Nanomaterial Fate, Transport and Transformation in a Freshwater Mesocosm	$262,158
PN08058/2145	Nano-Ribbon Membranes for Viable CO2 Separation	$149,040
PN08059/2146	Nanoscale Tantalum Oxide Electrocatalysts for Polymer Electrolyte Membrane Fuel Cells	$99,147
PN08061/2148	Nuclear Fuel Cycle Safeguards	$445,394
PN08062/2149	Optimizing Generation Portfolios and Dispatches with Consideration of Environmental Constraints in View of Significant Penetration of Intermittent Renewable Energy Resources	$118,981
PN08063/2150	PCR Arrays For Quantitative Evaluation of Microbial Communities	$230,582
PN08064/2151	Predicting the Impact of Climate Change on U.S. Power Grids and Its Wider Implications on National Security	$224,138
PN08065/2152	Process Modeling of Chemically Complex Solid-Liquid Suspensions	$294,311
PN08066/2153	Prognostics and Predictive Risk Assessment in Computational Infrastructures	$170,867
PN08067/2154	Proteomic Methods and Quantitative Structure Activity Relationship Models to Predict Nanoparticle Surface Chemistry Interactions	$258,371
PN08068/2155	Prussian Blue Analogues and Interpenetrated Metal-Organic Frameworks for CO2 Capture	$154,955
PN08070/2157	Scientific Metadata Services (SMS) Architecture	$148,747

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Project ID	Project Name	FY Total
PN08071/2158	Self-Correcting Controls for Heating, Ventilation, and Air Conditioning Systems	$128,196
PN08072/2159	Simultaneous Charge Transport in Laterally Confined One-Dimensional Systems	$123,050
PN08074/2161	Spent Fuel Shipping and Storage Cask Monitor	$35,084
PN08075/2162	Standoff Concealed-Device Detection and Signature Analysis using Non-Imaging Sub-Millimeter Wave Radar	$109,893
PN08076/2163	Standoff Infrared Detection of Explosives	$137,709
PN08077/2164	Theoretical Modeling and Ex-Reactor Testing of Fuel Properties to Accelerate Fuel Qualification	$222,540
PN08079/2166	Ultra-Pure Nuclear Physics Materials - Chemical Production of Copper	$51,729
PN08080/2167	Understanding Ice Formation in the Atmosphere	$733,571
PN08081/2168	Vulnerability of Food Security and Energy Infrastructures to Climate Change and Terrorism	$204,916
PN09001/2169	A Modeling Approach to Understanding and Mitigating the Environmental Impacts of Tidal Power	$235,032
PN09002/2170	A Real-Time Optical Spectroscopy Platform for Investigating Molecular Mineral Transformations for CO2 Storage	$186,808
PN09003/2171	Advanced Cathodes for Sodium-Beta Batteries and Renewable Energy Applications	$266,867
PN09004/2172	Advanced Computing Architectures for Smart Sensors and Sensor Analytics	$145,543
PN09005/2173	Advanced Environmental Sampling Technology for Safeguards and Proliferation Detection	$186,111
PN09006/2174	Advanced Radiation Transport Methods	$225,729
PN09007/2175	Advanced Scalability for STOMP: Subsurface Simulation and Characterization at Extreme Resolution	$260,781
PN09008/2176	Advanced Sorptive and Signature Indicating Materials for Ultra-Trace Proliferation Detection	$179,113
PN09009/2177	An Advanced Integrated Organic Light-Emitting Devices System for Cost Effective, Efficient Solid State Lighting	$125,057
PN09010/2178	Analytical Framework for Assessing the Economics of Reliable Fuel Services and Supply	$109,288
PN09011/2179	Application of a Systems Biology Approach to Understanding Protein Function	$136,595
PN09012/2180	Application of Nitrogen Trifluoride (NF3) to the Nuclear Fuel Cycle	$124,324

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PNNL - Pacific Northwest National Lab

Project ID	Project Name	FY Total
PN09013/2181	Carbon Capture Process Modeling and Economic Evaluation Tool Development	$333,051
PN09014/2182	Climate Feedbacks in the MiniCAM Integrated Assessment Modeling Framework	$69,966
PN09015/2183	CO2 Separation and Capture by Chitosan Materials	$119,028
PN09016/2184	Community Diversity and Functional Redundancy of Cellulytic Microbial Communities in Soil Aggregates	$191,263
PN09017/2185	Cyber-Attack Risk Inference Model	$151,317
PN09018/2186	Data Assimilation Tools for CO2 Reservoir Model Development	$202,371
PN09019/2187	Demonstration of On-Line Monitoring and Physics Based Prognostics	$159,236
PN09020/2188	Designed Affinity Reagents with Extreme Stability and Selectivity	$166,694
PN09021/2189	Develop Ar-37 Measurement Capability for Treaty Verification Applications	$52,590
PN09022/2190	Develop Capabilities to Study the Cellular Interactions and Fate of Nanomaterials	$30,030
PN09023/2191	Developing an Initial Framework for a Regional Earth System Model	$45,210
PN09024/2192	Development and Evaluation of an Externally-Mixed Sectional Aerosol Model	$126,263
PN09025/2193	Development of a Dual-Sided, Temperature-Controlled, Continuous-Flow Environmental Chamber	$584,893
PN09026/2194	Development of Exascale Algorithms for Molecular Modeling	$224,903
PN09027/2195	Distance-of-Flight Mass Spectrometry for Rapid, Portable Actinide Analysis	$122,807
PN09028/2196	Dual-Mode Imaging for Dismantlement Transparency	$109,008
PN09029/2197	Engineering of Metal-Organic Frameworks Imbedded with Metal Nanoparticles for Catalysis Applications	$63,855
PN09030/2198	Enhance Control Technologies and HVAC System Capability in FEDS	$73,763
PN09031/2199	Enhanced Ion Detection Mechanisms for Ion Mobility Spectrometry	$170,700
PN09032/2200	Exploration of Pan-Omics for Biological Research	$295,997
PN09033/2201	Exploring Architectures Suitable for Scientific Applications at Exascale Levels	$259,612
PN09034/2202	Friction Stir Welding of Creep-Resistant Oxide Dispersion Strengthened Alloys	$123,943
PN09035/2203	Geological Sequestration Software Suite Core Architecture and Simulation Framework	$347,144
PN09036/2204	Higher-Throughput, More Sensitive Stable Isotope Probing	$228,471
PN09037/2205	Human Exposure Monitoring for Polybrominated Diphenyl Ethers Derivatives	$28,959

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PNNL - Pacific Northwest National Lab

Project ID	Project Name	FY Total
PN09038/2206	Impact of Energy Consumption and Technology on Global and National Energy Security	$144,588
PN09039/2207	In Situ Imaging of Mineral-Supercritical CO2 Reactions with Atomic Force Microscopy	$146,547
PN09040/2208	In Situ Nuclear Magnetic Resonance Investigations of Trapping Mechanisms in CO2 Storage	$268,352
PN09041/2209	Instrumentation for Explosives Detection Research	$85,956
PN09042/2210	Isotopic Ratio Fluence Monitors for Canadian Deuterium Uranium (CANDU) and Pebble Bed Modular Reactor (PBMR) Plutonium Production Verification	$59,505
PN09043/2211	Leveraging Scalable Demand Response Networks to Dramatically Enhance Carbon Emission Reductions	$223,617
PN09044/2212	Manipulation of Carbonate Geochemistry for Sequestration of Contaminants	$59,735
PN09045/2213	Marine Biomass and its Conversion to Liquid Transportation	$99,986
PN09046/2214	Material Interface Optimization in Extremely Thin Absorber Photovoltaics	$120,000
PN09047/2215	Microscale Spectroscopic Analyses of Cellulose Degradation and Uptake by a Microbial Community	$91,511
PN09048/2216	Modeling Protein-Nanomaterial Interactions	$70,711
PN09049/2217	Multi-Modality Sensing Platform for Smart Detection of Explosive Traces	$60,717
PN09050/2218	Multiscale Investigation of CO2 Behavior in Subsurface Under Extreme Conditions	$121,516
PN09051/2219	Multiscale Modeling from Molecular Reactions to Catalytic Reactors	$176,588
PN09052/2220	Multiscale Modeling of Materials Response to Non-Destructive Evaluation Sampling of Reactor Components	$101,692
PN09053/2221	Multiscale Models for Microbial Communities	$67,203
PN09054/2222	Novel Catalytic Route From Methanol/DME to Transportation Fuels	$174,491
PN09055/2223	On-Line Flaw Detection in Reactor Piping using Acoustic Emission and Guided Wave Ultrasonic Techniques	$99,964
PN09056/2224	Overall Warm Coal Syngas Cleanup	$119,944
PN09057/2225	Oxygen Optode for Chemical Imaging in Microfluidic Microbial Models	$126,048
PN09058/2226	Precision Information Fusion Environments	$108,607
PN09059/2227	Radiation Biology and Biophysics	$247,744
PN09060/2228	Rapid, Sensitive and Selective Explosives Detection Using Tunable Chemical Ionization Drift Mass Spectrometry	$59,205

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PNNL - Pacific Northwest National Lab

Project ID	Project Name	FY Total
PN09061/2229	Scalable Performance Diagnostics and Feedback for Massively Parallel Computers	$179,187
PN09062/2230	Sensitivity Analysis of Kalman Filter and Its Applications in Power Systems	$62,495
PN09063/2231	Solution State Structure/Function Studies of Amelogenin Using Nuclear Magnetic Resonance	$29,864
PN09064/2232	Spectroscopic X-ray Computed Tomography for Improved Explosives Detection	$23,683
PN09065/2233	Standoff Hyperspectral Imaging of Explosives Residues Using Broadly Tunable External Quantum Cascade Laser Illumination	$49,737
PN09066/2234	Standoff Radiography	$119,041
PN09067/2235	Surface Damage and Environment-Induced Cracking Precursors in Light Water Reactor Components	$60,120
PN09068/2236	Synthetic Biology Approach for Hydrocarbon Production in Microbial Photoautotrophs	$144,796
PN09069/2237	Thermally Stable Chemical Markers	$150,624
PN09070/2238	Tools for Evaluation of Net-Zero Community Concept and Integration of Buildings, Renewables and the Grid	$95,701
PN09071/2239	Transfer and Evaluation of the Community Atmosphere Model Parameterization Suite to Weather Research and Forecasting Model	$35,831
PN09072/2240	Transformational Materials for Advanced Stationary Electricity Storage	$481,210
PN09073/2241	Ultrascalable Solvers for Subsurface Simulation	$220,685
PN09074/2242	Validation of Environmental Biomarkers in Periphyton Communities Exposed to Uranium	$105,439

Total # of Projects for PNNL: **172** **Total Cost for PNNL:** **$29,399,750**

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PRINCE - Princeton Plasma Physics Lab

Project ID	Project Name	FY Total
PPPL-007	Plasma Cathode with Secondary Emission	$98,875
PPPL-010	Study of the Evolution of Magnetic Topology and Associated Global MHD Phenomena	$113,376
PPPL-012	Creation of a Plasma Source for Diamond Thin Film Deposition	$179,667
PPPL-013	Modeling of ULF Waves in Mercury's Magnetosphere	$81,237
PPPL-014	Plasma Synthesis of Hydrogen Peroxide	$68,491
PPPL-015	Development of Slowly Flowing Liquid Lithium Walls for a Fusion Reactor	$78,526
PPPL-016	X-ray Imaging Schemes with Matched Pairs of Spherically Bent Crystals	$163,843
PPPL-017	Full-wave Modeling of Wave-Plasma Interaction in Earth's Magnetosphere	$163,742
PPPL-018	Symplectic Integrators for Long-time Simulations of Multi-scale Dynamics of Gyro-center Particles	$118,931

Total # of Projects for PRINCE: **9** **Total Cost for PRINCE:** **$1,066,688**

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PTX - Pantex Plant

Project ID	Project Name	FY Total
PX07001	High Explosives Operations Safety Controls Validation	$145,805
PX07003	Lightning and Power Distribution System Fault Modeling	$26,277
PX07007	Reactions of Hydrofluoroethers	$381,539
PX07008	Composition and Strength of Ta-Based Welds for Storing SNM Materials	$35,022
PX08008	Benchtop High Explosives Testing	$184,659
PX08010	Continuation of Microwave Technolgy Testing	$256,091
PX08011	Determination of Hansen Solubility Parameters for Cleaning Applications	$76,207
PX09001	Evaluation of Suspension Fluids Used In Laser Light Scattering	$4,559
PX09002	Gas Reactions Within Sealed Volume of LANL and LLNL Weapons	$29,305
PX09004	Ultra Performance Liquid Chromatography	$95,468
PX09006	NS Insoluble Material Evaluation by Soxhlet Extraction	$635
PX09007	Lightning and Production Throughput	$60,233
PX09010	Digital Image Correlation (DIC)	$96,631
PX09015	Fracture Mechanics of HMX Based HIgh Explosive Components	$7,182
PX09016	Precision Coating PBX Formulation Process--Characterization and Testing	$4,030

Total # of Projects for PTX: **15** **Total Cost for PTX:** **$1,403,643**

United States Department of Energy
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SLAC - SLAC National Accelerator Laboratory

Project ID	Project Name	FY Total
01	Development of Next Generation Laser for LCLS	$456,680
02	Develop & Design for a Super B-factory Interaction	$170,032
03	Computational Modeling and Simulation of Electron Dynamics & Excited States	$514,566
04	Integrated TeV Gamma-ray Camera Readout System	$95,667
05	Utralow Emittance Lattice & Study of Beam Dynamics for PEP-X	$396,502
06	Detectors for Measurement of Cosmic Microwave Background Polarization	$155,500
07	SLAC-PNNL Scientific Computing Seminar Series	$11,656
08	Echo-7	$29,150

Total # of Projects for SLAC: **8** **Total Cost for SLAC:** **$1,829,753**

United States Department of Energy
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SNL - Sandia National Lab

Project ID	Project Name	FY Total
102600	Nanoengineering for Solid State Lighting	$376,877
102660	"Bottom-up" Meets "Top-down:" Self-assembly to Direct Manipulation of Nanostructures on Length Scales from Atoms to Microns	$251,741
102737	Creation of Water-Treatment Membrane Technologies with Reduced Biofouling	$287,305
105722	Discovery, Integration, and Interrogation of Biotic/Abiotic Materials and Systems	$669,653
105726	Radiation Hardened Components for Space Qualified Point-of-Load Power Conversion	$752,376
105729	Thermal Microphotonic Focal Plane Array (TM-FPA) for High Sensitivity Room Temperature Infrared Imaging	$209,660
105730	Tuned Micro-Cavity Magnetometer / Quantum Computation Device	$353,392
105732	MESA ASML Scanner Based Reticle Field-Stitch Capability Enabling Wafer Scale Integration with Direct Impact on Mega-Pixel Focal Plane Array Synthesis	$348,317
105736	Ultra-Thin Packaging of Electronic Assemblies	$364,084
105737	Graph-Based Informatics for Nonproliferation and Counterterrorism	$200,105
105738	Advanced Line of Sight Stabilization Experiment	$364,055
105739	Scannerless Range Imaging for Autonomous Rendezvous and Capture	$305,648
105742	Managing Thermal Emission: Subwavelength Diffractive Optics Technology in Support of SOF	$447,929
105743	Enhanced Inverse SAR	$295,968
105744	Heterogeneous Microsystem Integration as Applied to the Practicality of a Small Caliber Guided Bullet	$423,758
105746	Autonomous Intelligent Assembly Systems	$377,436
105747	MEMS Sensors and Telemetry For Prognostic Health Management	$440,100
105748	Building a Live/Virtual/Constructive Experimental Testbed	$390,072
105749	Plasmonic Antireflection Coatings (PARC)	$401,984
105799	Lightweight Storage and Overlay Networks for Fault Tolerance	$225,949
105800	Microstructure-based Approach for Predicting Crack Initiation and Early Growth in Metals	$641,612
105804	Advanced Diagnostics for Full-Scale Fire Experiments: Closure of the Radiation Source Term and Spectral Fire Signatures	$540,787

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Project ID	Project Name	FY Total
105805	Nanomechanics of Films on Compliant Substrates to Enable New Flexible MEMS and NEMS Devices	$525,324
105806	Crossing the Mesoscale No-Man's Land: Massively Parallel Kinetic Monte Carlo	$455,751
105808	Predictive Modeling of Microenergetics	$1,041,589
105809	Building More Powerful Less Expensive Supercomputers Using Processing-In-Memory (PIM)	$405,360
105810	Reduced Order Modeling of Fluid-Structure Interaction	$337,005
105812	Highly Scalable Linear Solvers for Large Science Simulations on Thousands of Processors	$297,733
105813	Massive Multithreading Applied to National Infrastructure and Informatics	$406,860
105814	Practical Reliability and Uncertainty Quantification for Complex Hierarchical Systems	$444,793
105815	HPC Application Performance Analysis and Prediction	$411,358
105816	Model Reduction of Large Dynamic Systems with Localized Nonlinearities	$623,072
105824	Geophysical Remote Sensing of Water Reservoirs Suitable for Desalination	$473,646
105825	Advanced Fuel Chemistry for Advanced Engines	$326,448
105829	Supercritical CO2 Brayton Cycle Test-Loop Development, Controls, Testing, and Model Validation	$573,788
105833	Foundational Development of an Advanced Burner Reactor Integrated Safety Code	$616,623
105863	Nuclear Facility Counterproliferation	$424,686
105864	Tracking Nuclear Materials Processing: Metabonomics of Indigenous Species	$323,552
105865	Innovative Control of a Flexible, Adaptive Energy Grid	$385,314
105867	Decision Support for Integrated Water-Energy Planning	$425,255
105870	Enabling All-Threat Analysis Through Intelligent Filtering of Network Traffic	$456,343
105872	Enhanced Simulation for Homeland Security Training	$628,938
105873	Research on Micro-sized Acoustic Bandgap Structures	$491,484
105874	Intelligent Front-end Sample Preparation Tool using Acoustic Streaming	$511,906
105875	Development of a Multivariate Electrochemical Tool (MET)	$199,833
105876	RF/Microwave Properties of Nanotubes and Nanowires	$434,724
105877	Novel Diagnostic for Advanced Measurements of Semiconductor Devices Exposed to Adverse Environments	$298,435

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Project ID	Project Name	FY Total
105878	Irradiation for the Novel Radiolytic Formation of Superalloy Nanoparticles	$397,232
105879	MicroKelvin Molecule Production	$409,392
105893	Compositional Ordering and Stability in Nanostructured, Bulk Thermoelectric Alloys	$447,532
105906	Phonon Engineering for Nanostructures	$647,465
105914	The Many Mechanisms for Strain Relaxation in III-Nitride Heterostructures: How, When and Why?	$410,862
105917	Enhanced Spontaneous Emission Rates in Visible III-Nitride LEDs Using 3D Photonic Crystal Cavities	$607,173
105922	Advanced Optical Measurements and Novel Microsystems for Characterizing Photophysical Properties of Single Nanoparticles	$381,416
105931	Science at the Interface: Grain Boundaries in Nanocrystalline Metals	$529,867
105932	Pumping Up CO2 and Its Conversion into Synthetic Fuels and Other Useful Molecules	$390,600
105933	Nanoengineering of Active Interfaces for Organic-Inorganic Optoelectronics	$545,100
105935	The Physics of 1D and 2D Electron Gases in III-Nitride Heterostructure Nanowires	$467,367
105936	Neural Assembly Models Derived through Nano-Scale Measurements	$603,260
105938	Modeling Aspects of Human Memory and Reasoning for Scientific Study	$420,233
105939	Psychologically Plausible Learning Mechanisms for Sandia's Cognitive Framework	$582,584
105940	Resolving Dynamics of Cell Signaling via Real-Time Imaging of the Immunological Synapse	$496,724
105943	Microalgal Biodiesel, Feedstock Improvement by Metabolic Engineering	$489,824
105944	Synthetic Biology of Novel Thermophilic Bacteria For Enhanced Production Of Ethanol From 5-Carbon Sugars	$449,965
105946	Efficient Breakdown of Lignocellulose Using Mixed-microbe Population for Bioethanol Production	$495,172
105948	Nanolaminate Thin Film Heat Sources for Advanced Weapon Components	$463,695
105950	Multifunctional and Hybrid Energetic Components	$461,969
105951	Active Polymer Composites for Detecting Abnormal Thermal and Optical Environments	$390,719
105953	Optical Gaseous Atmosphere Sensing and Monitoring Using Surface Plasmon Resonance Spectroscopy and Custom Optic Coatings	$432,022

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Project ID	Project Name	FY Total
105954	Horizon: Next Generation Architecture for a Small Dynamically Reconfigurable Weapon System	$396,037
105964	Multilayer Coextrusion Techniques for Developing High Energy Density Organic Devices	$389,502
105966	A Radiation Microscope for SEE Testing Using >10 GeV Ions	$452,099
105970	High Power Density X-ray Sources	$252,990
105971	Automated Monte Carlo Biasing for Photon-Generated Electrons Near Surfaces	$397,621
105972	Ferroelectric Opening Switches for Large-Scale Pulsed Power Drivers	$570,856
105975	Equation of State and Transport Property Measurements of Warm Dense Matter	$335,059
105976	Low Impedance Z-Pinch Drivers Without Post-Hole Convolute Current Adders	$199,883
105979	Expansion of QMD Materials Modeling to Surface Phenomena of Importance to Electrical Breakdown in Pulsed Power Systems	$276,092
105987	Understanding Surface Breakdown in Electronegative Gases	$451,637
106397	Multi-Mode Energy Scavenging from the Environment	$52,500
106401	Passive and Active Electromagnetic Frequency Selective Surfaces for High-Power Beam Applications	$270,771
106408	Improving Robot Navigation through Self-Supervised Online Learning	$52,500
107441	Creation of a First Principles Simulation of Weapons Generated Electromagnetic Pulse	$360,131
110404	Network Design Optimization of Fuel Cell Systems and Distributed Energy Devices	$244,476
110407	Advanced Materials for Water Treatment Membranes: Enhanced Rejection Performance and Surface Properties	$27,985
113483	Interfacial Property Control of Elastomeric Nanocomposites	$421,038
113484	Improving Electronic Structure Calculations to Predict Nano-optoelectronics and Nanocatalyst Functions	$321,024
113485	Developing a Thermal Microscopy Platform for In-Situ Thermal/Thermoelectric Structure-Property Studies of Individual Nanotubes and Nanowires	$492,509
113486	Fundamentals of Synthetic Conversion of CO2 to Simple Hydrocarbon Fuels	$249,945
113487	Electrostatic Microvalves Utilizing Conductive Nanoparticles for Improved Speed, Lower Power, and Higher Force Actuation	$386,753
113488	Nanoengineering by Optically Directed Self Assembly	$449,624

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Project ID	Project Name	FY Total
113489	Optimized Nanoporous Materials	$349,482
113490	CO2 Reduction Using Biomimetic Photocatalytic Nanodevices	$403,455
113491	Stress-Induced Chemical Detection Using Flexible Coordination Polymers	$381,545
117739	Overcoming Jitter Effects for Remote Staring Sensors	$331,971
117742	Precision Nano-Bumping Technology for Large Format Focal Plane Arrays	$500,147
117743	Advanced Data Processing Module for Future Satellite Projects	$355,469
117745	Miniaturized 3-D Magnetic Phasors	$223,016
117746	Innovative Solutions for Terrestrial Based Tagging, Tracking, and Locating and Clandestine Data Exfiltration	$341,348
117748	Adaptive, Lightweight, Coated Fabrics for Protection from Low Velocity Fragments and Projectiles	$293,124
117749	Oxygen Insensitive Anode Chemistry to Enable the Spray Paintable Battery	$602,447
117752	Real-time Individualized Training Vectors for Experiential Learning	$359,661
117755	Micro Mobility / Propulsion	$355,444
117758	Automated Entity Relationship Extraction	$251,494
117759	Extremely Thin Chemical Sensor Arrays Using Nanohole Arrays	$247,452
117761	Flexible Thin Film Battery Development	$275,498
117762	Integrated Point-of-use Two Dimensional Fuel Cell	$201,569
117763	Assessment of Vista Security Technologies	$415,486
117764	Understanding and Developing Countermeasures for Botnets	$301,522
117770	Composite Thermal Protection Systems Incorporating Energy Absorption With Oxidation Resistance	$315,903
117773	Investigation of Technologies for Hypersonic Payload Release	$282,970
117774	The SEPIA Hybrid Network Analysis Environment	$313,160
117775	High-Speed Spectral Sensor	$387,835
117776	Electromagnetic Launch Science and Technology	$1,252,956
117777	Creating a Model-Based Secure Digital Radio Design Methodology	$524,419
117778	LEEM Examinations	$150,320
117779	Ultrathin Optics for Low-Profile, Innocuous Imager	$203,479
117782	Leveraging Multi-way Linkages on Heterogeneous Data	$476,582

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Project ID	Project Name	FY Total
117783	Peridynamics as a Rigorous Coarse-Graining of Atomistics for Multiscale Materials Design	$590,642
117784	Predicting Fracture in Brittle Micro-scale Structures	$500,370
117785	A Light Weight Operating System for Multicore Capability Class Supercomputers	$373,622
117786	Enhanced Molecular Dynamics for Simulating Thermal and Charge Transport Phenomena in Metals and Semiconductors	$355,041
117787	Solution Methods for Very Highly Integrated Circuits	$336,391
117788	Scalable Solutions for Processing and Searching Very Large Document Collections	$386,652
117789	Scaling I/O for High Performance Commodity Clusters	$443,698
117790	Surface Rheology and Interface Stability	$435,145
117791	Phenomenological Basis for Safety Assessment of Nuclear Process Facilities	$209,635
117792	Development of a New Generation of Waste Form for Entrapment and Immobilization of Highly Volatile and Soluble Radionuclides	$360,612
117793	Metal Fires and Their Implications for Advanced Reactors	$474,980
117794	Design and Evaluation of Border Management Systems	$342,072
117795	Computational and Experimental Platform for Understanding and Optimizing Water Flux and Salt Rejection in Nanoporous Membranes	$545,538
117796	Development of Efficient, Integrated Cellulosic Biorefineries	$600,370
117798	Intelligent Power Controllers for Self-Organizing Microgrids	$340,469
117801	Spectroscopic Radiation Detectors for Extreme Environments	$406,167
117805	Biosafety Risk Assessment Methodology (Biosafety-RAM)	$206,633
117806	Investigation of Ultra-low-power PMT-based Radiation Detectors	$154,539
117807	Anticipating The Unintended Consequences Of Security Dynamics	$480,320
117810	Novel Instrumentation for Selective Photo-Ionization and Trapping of Fine Particles	$536,763
117811	Microbial Agent Detection using Near-IR Electrophoretic and Spectral Signatures for Rapid Identification in Detect-to-Warn Applications	$392,283
117812	Antibacterial Polymer Coatings	$326,595
117813	High Volume Preconcentrator Coatings for High Vapor Pressure Compounds	$269,354
117814	Two-pulse Rapid Remote Surface Contamination Measurement	$354,357
117816	Automatic Recognition of Malicious Intent (ARMI)	$389,094

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Project ID	Project Name	FY Total
117817	Risk-based Decision Making for Staggered Terrorist Attacks - Situational Awareness, Resource Markets and Systemic Risk Reduction Under "Reload" Scenarios	$324,349
117818	Active Coded-Aperture Neutron Imaging	$613,436
117819	Injection-Locked Composite Lasers for mm-Wave Modulation	$429,702
117820	Nanopatterned Ferroelectrics for Ultrahigh Density Rad-Hard Nonvolatile Memories	$407,585
117822	Integrated Optical Phase Locked Loop (IO-PLL) for Attosecond Timing in Microwave Oscillators	$457,705
117825	Four-Wave Mixing for Phase-Matching-Free Nonlinear Optics in Quantum Cascade Structures	$449,862
117827	A Revolution in Micropower: The Catalytic Nanodiode	$473,680
117829	Efficient Multi-exciton Emission from Quantum Dots	$598,059
117830	Programmed Assembly of Nanoscale Three-Dimensional Networks of Inorganic Materials	$490,451
117832	Templated Synthesis of Nanomaterials for Ultracapacitors	$572,992
117833	Anomalous Suppression of Fatigue and Wear through Stable Nanodomains	$500,612
117834	Impact of Defects on the Electrical Transport, Optical Properties and Failure Mechanisms of GaN Nanowires	$681,239
117835	Energy Conversion using Chromophore-Functionalized Carbon Nanotubes	$356,385
117837	Studies of the Viscoelastic Properties of Water Confined Between Surfaces of Specified Chemical Nature	$393,714
117838	Biomolecular Transport and Separation in Nanotubular Networks	$556,160
117839	Initiation of the TLR4 Signal Transduction Network - Deeper Understanding for Better Therapeutics	$517,306
117840	"Trojan Horse" Strategy for Deconstruction of Biomass for Biofuels Production	$436,127
117841	Enhanced Performance of Engineered Neural Networks using Nanostructured Probes and Predictive Computational Modeling	$498,294
117842	Atomic Magnetometer for Human Magnetoencephalography	$510,269
117843	Determination and Optimization of Spatial Samples for Distributed Measurements	$131,019
117844	Intrinsically Secure Communications through Adaptive Beamforming	$358,432
117845	Advanced Cathode and Electrolyte for Thermal Batteries	$529,666

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Project ID	Project Name	FY Total
117846	MEMS-enabled Integrated Optical Circuits for Nuclear Weapons Applications	$426,215
117847	3D Integration Technology for Highly Secure, Mixed Signal, Reconfigurable Systems	$612,002
117849	Creating a Smart Fast-Neutron Calibration Source	$365,713
117851	Microresonators for Advanced RF Systems	$392,225
117853	Novel Foam Encapsulation Materials and Processes	$466,793
117856	Measuring High-Pressure Strength on Pulsed Power Machines	$514,425
117859	Advanced Magnetized HED Physics Modeling	$388,857
117860	Demonstration of Fast Pulsed Neutron Capability for Device and Board Testing	$446,975
117862	Evaluate Radial Wire Arrays for ICF and RES	$478,559
117863	Scaling of X-pinch X-ray Sources from 1 MA to 6 MA	$499,860
117864	Phase Conjugate Interferometer for Time-Resolved Measurement of Material Morphology	$73,922
117866	Physics of Intense, High Energy Radiation Effects	$304,902
117992	High-Throughput Discovery and Validation of Biomarkers for Biodefense	$665,880
118735	Low Dislocation GaN via Defect-Filtering, Self-Assembled SiO2-Sphere Layers	$251,546
118841	Aligned Mesoporous Architectures and Devices	$52,500
118842	Rheological Properties of Nanocomposites	$56,206
118843	A New Chamber Design for Aerosol Evolution Studies in the Ambient Environment	$23,883
119351	Network Discovery, Characterization and Prediction	$5,294,780
119352	Quantum Information Science and Technology	$4,734,797
119355	Solving Unique Challenges Associated with Packaging and Materials Interactions for Things Thin	$150,678
119634	Spatial Optimization for Regional Stormwater Infrastructure: Balancing Water Quality, Supply Augmentation and Ecosystem Function	$29,876
119638	Using Reconfigurable Functional Units in Conventional Microprocessors	$26,250
119639	Heat Conduction and Particle Motion in Stationary Nanofluids	$54,515
119640	Nanotransport and Control of Molecules Through Molecular Gates	$30,450
119644	Solar Hydrogen Generation with Porous Semiconductor Electrodes	$57,232

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Project ID	Project Name	FY Total
119645	Signature Molecular Descriptor: Advanced Applications	$58,530
119647	Physiological Models and Inference Based on Optical Imaging	$52,500
120207	Passive High-Flux Thermal Management of Electrochemical Systems with in situ Microchannel Phase Change	$30,006
120208	Cosmic-ray Hydrometrology for Land Surface Studies	$242,540
120209	Multiscale Schemes for the Predictive Description and Virtual Engineering of Materials	$244,680
120254	Cross-layer Design for Secure Communications in MANETs	$29,766
120460	Mobile Agent Systems for Distributed Embedded System Reasoning and Complex Warfare Simulation	$27,386
120479	Advanced I/O for Large-Scale Scientific Applications	$26,250
120711	Nanolithography by Combined Self-Assembly and Directed-Assembly	$298,144
124007	Fundamental Studies of Electrokinetic Phenomena in Polymer Microsystems	$60,267
124009	Novel Methods for Detecting and Defending Against Advanced Malware	$296,373
124643	The Development of a Mechanical Weaklink Prototype for NW Systems	$439,255
125854	Development of Novel Porous Nanocomposites for National Security Applications	$108,464
126613	Solid-Oxide Electrochemical Reactor Science	$93,388
129145	Feasibility Investigation of a Quantifiable and Objective Approach to Organizational Performance Enhancement	$24,924
129297	Biodefense and Emerging Infectious Disease Collaborations with UTMB	$384,469
129299	Laser Detection	$142,177
130419	Land-surface Studies with an Imaging Neutron Detector	$96,430
130420	Plasmonic Enhanced Ultrafast Photoconductive Switch	$85,337
130697	A Toolkit for Detecting Technical Surprise	$278,791
130698	A Zero Power, Motion Sensitive MEMS Wake-up Circuit	$220,449
130699	Advanced Optics for Military Systems	$251,362
130700	High Performance, Highly Producible Focal Plane Arrays	$937,939
130701	Assessing Vulnerabilities of Wireless USB	$296,506
130703	Assessment of Software Streaming Technology	$492,628
130704	Automated AOI Management for Future Sensor Systems	$497,804

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Project ID	Project Name	FY Total
130705	Boundary-Layer Transition on Maneuvering Hypersonic Flight Vehicles	$141,706
130706	Space Object Imaging and Signal Transmission Through Turbulence and Debris	$155,271
130707	Directed Robots for Increased Military Manpower Effectiveness	$326,107
130709	Identifying Objects in Bright Fields Using New Ultra-dark, Tunable Nanorug	$103,740
130711	Information Systems Analysis using Agent Collectives	$345,275
130713	Localized X-Ray Radiation Effects	$148,873
130715	Malware Attribution through Binary Analysis	$331,881
130716	Miniaturized Integrated RF Systems	$249,522
130717	Next Generation, High Bandwidth Electronics Substrate Technology for Future Satellite Systems	$200,202
130720	Next Level Technology Development for Satellite Based Processing Architectures	$654,461
130723	Non-Traditional Implementation of High Processing Gain via Standard RF Transceivers and Low-Power Microcontrollers	$180,586
130725	Phase-based Geolocation	$298,286
130726	Science and Implementation of Micro-Batteries	$282,233
130727	Silicon Microphotonic Backplane for Focal Plane Array Communications	$508,046
130729	Velocity Independent Continuous Tracking Radar	$453,835
130731	Wavelength-Division-Multiplexed (WDM) Free Space Optical Communication Using a High Repetition Rate Coherent Broadband Femtosecond Laser	$314,251
130732	"Equation-Free" Simulation Methods for Multiple Timescale Diffusion Processes in Solids	$487,834
130734	Bayesian Data Assimilation for Stochastic Multiscale Models of Transport in Porous Media	$455,471
130739	Computational Mechanics for Geosystems Management to Support the Energy and Natural Resources Mission	$1,014,364
130740	Experimental Characterization of Energetic Material Dynamics for Multiphase Blast Simulation	$555,916
130741	Nanomanufacturing: Nano-Structured Materials Made Layer-by-Layer	$1,006,652
130742	Optimization of Large-Scale Heterogeneous System-of-Systems Models	$792,886
130743	System-Directed Resilience for Exascale Platforms	$506,962

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Project ID	Project Name	FY Total
130744	An Ion Beam Platform for Screening and Studying Materials for Use in Fast Neutron Environments	$430,520
130745	Cognitive Stakeholder Modeling for Resource Management	$518,466
130746	International Physical Protection Self-Assessment Tool for Chemical Facilities (IPPSAT-CF)	$209,055
130747	Intrinsic Security for Insider Threats	$483,867
130748	Linking Ceragenins to Water-Treatment Membranes to Minimize Biofouling	$469,958
130749	Membranes and Surfaces Nano-engineered for Pathogen Capture and Destruction	$340,646
130750	Modeling of Advanced Nuclear Fuel Pins	$441,044
130751	Novel Radiation Detection Technology for Active Interrogation	$783,651
130752	Scalable Microgrid for a Safe, Secure, Efficient, and Cost Effective Electric Power Infrastructure	$533,253
130753	Space Reactor Impact-Criticality Modeling for Launch Safety	$443,779
130755	A C. elegans-Based Foam for Rapid On-Site Detection of Residual Live Virus	$491,918
130756	Deployable Pathogen Diagnostic System	$477,674
130759	Development of an Explosive Materials Threat Assessment Tool	$369,191
130760	Intrinsic Security Principles	$156,787
130761	Non-Toxic, Non-Corrosive Approach for Decontamination of Anthrax Spores in Critical Infrastructure	$199,914
130762	Risk-based Security Cost-benefit Analysis Tool	$439,966
130763	Target Detection and Tracking in Cluttered Environments using Rapidly Deployable VPED Sensor Networks	$469,572
130764	Uncooperative Biometric Identification at a Distance	$452,895
130766	Vulnerability of Multi-network Infrastructure to Cascading Failure: Design of Robustness to Orchestrated Attack	$406,019
130767	Architecturally Controlled Nanocathode Materials for Improved Rechargeable Batteries	$458,956
130768	Atomic Mechanisms Governing Interface Formation in Nanostructured, Phase-Separated Thermoelectric Alloys	$160,634
130769	Bio-inspired Nanocomposite Assemblies as Smart Skin Components	$448,760
130770	Characterization and Control of the Thermal Fluctuations of Nanosensors for Next Generation Sensitivity and Robustness	$294,802
130771	Enabling Graphene Nanoelectronics	$855,060

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Project ID	Project Name	FY Total
130772	Hierarchical Electrode Architectures for Electrical Energy Storage and Conversion	$604,301
130773	Hierarchical Morphology Control for Nanocomposite Solar Cells	$610,526
130774	High Temperature, Large Format FPAs for Emerging Infrared Sensing Applications	$538,450
130775	Narrow-Linewidth VCSELs for Atomic Microsystems	$443,461
130777	Phonon Manipulation with Phononic Crystals	$517,026
130778	Real-Time Studies of Battery Electrochemical Reactions Inside a Transmission Electron Microscope	$447,229
130779	Science-based Solutions to Achieve High Performance Deep UV Laser Diodes	$479,252
130780	Transport Mechanisms for Charge Transfer Processes at Electrode-Solid-Electrolyte Inferfaces	$648,019
130781	A Systems Biology Approach to Understanding Viral Hemorrhagic Fever Pathogenesis	$830,339
130782	Biomolecular Interactions and Responses of Human Epithelial and Macrophage Cells to Engineered Nanomaterials	$264,043
130783	From Algae to Oilgae: In Situ Studies of the Factors Controlling Growth, Oil Production, and Oil Excretion in Microalgae	$525,548
130784	Functional Brain Imaging by Tunable Multi-Spectral Event-Related Optical Signal (EROS)	$197,876
130785	K-Channels: On/Off Switches of Innate Immune Responses	$453,020
130786	Modeling Cortical Circuits	$252,579
130787	Robust Automated Knowledge Capture	$444,558
130791	Embeddable Optical Current Monitors for High-Current Signal Confirmation	$378,350
130792	Faraday Micro-Shields and Novel Electromagnetic Isolation Structures	$299,696
130793	Field and Charge Penetration By Lightning Burnthrough	$297,323
130794	MEMS-Based Non-Volatile Memory Technology	$431,879
130796	Nanomaterials for Surety Application	$414,344
130797	Novel Dielectrics with Engineered Thermal Weaklink	$325,776
130798	Signal Processing Techniques for Communication Security	$188,101
130799	Solid State Neutron Sources	$514,086
130800	Understanding and Predicting Metallic Whisker Growth and its Effect on Reliability	$366,116

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Project ID	Project Name	FY Total
130801	Vapor Phase Lubrication for Advanced Surety Components	$532,049
130802	Advanced Tactical HPM System via NLTL and LWA	$559,426
130804	Confinement of High-Temperature Laser-Produced Deuterium Plasmas Using Pulsed Magnetic Fields	$361,207
130805	High-Efficiency High-Energy K-alpha Source for the Critically-Required Maximum Illumination of X-ray Imaging Optics on Z Using Z-Petawatt-Driven Laser-Breakout-Afterburner-Accelerated Ultra-Relativist	$337,719
130806	Material Development for Radiation Hardness	$511,312
130807	Modeling Ramp Compression Experiments using Large-Scale Molecular Dynamics Simulation	$398,816
130808	New Density Functional Theory Approaches for Enabling Prediction of Chemical and Physical Properties of Heavy Elements	$294,099
130809	Study of Radiative Blast Waves Generated on the Z-Beamlet Laser	$206,247
130810	Computational Models of Intergroup Competition and Warfare	$28,334
130811	Data Mining for Improved Computer System Architecture	$26,250
130812	Data-Driven Optimization of Dynamic Reconfigurable Systems of Systems	$29,219
130813	Development and Characterization of 3D, Nano-Confined Multicellular Constructs for Advanced Biohybrid Devices	$245,939
130814	Development of a Structural Health Monitoring System for the Assessment of Critical Transportation Infrastructure	$28,496
130815	Distributed Video Coding for Arrays of Remote Sensing Nodes	$28,292
130817	Evaluation of Baseline Numerical Schemes for Compressible Turbulence Simulations	$58,216
130818	Interfacial Electron and Phonon Scattering Processes in High-powered Nanoscale Applications	$243,495
130819	Laser Doppler Vibrometer Measurements of Carbon Nanotubes' Vibration Spectra: A High Frequency Resolution Technique with Sensor Applications	$29,930
130820	Nanocomposite Materials for Efficient Solar Hydrogen Production	$26,460
130821	Nanotexturing of Surfaces to Reduce Melting Point	$58,614
130823	Neural Correlates of Attention	$32,674
130825	Optical Properties of Dielectric/Metal Composites	$27,563
130826	PIV Investigation of the Richtmyer-Meshkov Instability after Reshock	$29,598
130827	Relating Polymer Dynamics to Molecular Packing	$26,250

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Laboratory, Plant or Site Directed Research and Development Report
Project List -- Fiscal Year 2009

SNL - Sandia National Lab

Project ID	Project Name	FY Total
131302	Metamaterial Science and Technology	$3,819,355
131303	Reimagining Liquid Transportation Fuels: Sunshine to Petrol	$3,934,823
131305	Featureless Tagging Tracking and Locating	$2,355,039
131333	High Fidelity Nuclear Energy System Optimization	$25,877
131503	High Frequency RF Effects	$195,669
131541	Security Through Unpredictability	$362,888
134529	Engineering Framework for Complex Adaptive Systems of Systems (CASoS) and Applications to the Global Energy System (GES)	$727,278
135039	Unintended Consequences of Climate Mitigation	$91,420
135040	Authentication for High Exposure Cyber Systems	$101,085
135041	Molecule-Based Approach for Computing Chemical-Reaction Rates in Upper-Atmosphere Hypersonic Flows	$126,797
135042	Technologies for Autonomous Satellite Capture	$128,962
135192	A Fundamentally New Approach to Air Cooling	$173,297
135456	Water Behavior in Nanoporous Materials	$50,057
135459	Ordered Nanoporous Materials for Plasmonic Devices and Sensors	$49,980
135568	Low Permittivity and High Tunability Composite (Ba,Sr)TiO3 - Spinel Thin Films Utilizing Nanoscale Epitaxial Self-assembly	$49,603
135569	Nanostructured Material for Advanced Energy Storage	$26,250
135790	Hazard Analysis and Visualization of Dynamic Complex Systems	$55,312
135791	Simulation of Ion Beam Induced Current in Radiation Detectors and Microelectronic Devices	$48,781
135792	Quantitative Study of Rectangular Waveguide Behavior in the THz	$509,663
135802	Molecular Fountain Based on Kinematic Cooling	$112,248
137012	Host Suppression and Bioinformatics for Sequence-based Characterization of Unknown Pathogens	$512,459
137299	Processor Modeling for use in Large-Scale Systems Models	$52,500
137804	Designer Catalysts for Next Generation Fuel Synthesis	$62,674
137805	High-Speed Hyperspectral Measurement of LNG Combustion	$79,511
137807	Reduced Order Models for Thermal Analysis	$126,389
138274	Application of Microeconomic Theory to Intelligence Remote Sensing	$42,393

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report
Project List -- Fiscal Year 2009

SNL - Sandia National Lab

Project ID	Project Name	FY Total
138301	Parallel Digital Forensics Infrastructure	$29,530
138635	Correlation of Dimensional Measurement Uncertainties for Hybrid Measurement Systems	$49,776
138637	Electrochemical Solution Growth of Indium Nitride	$49,935
138638	Polymer/Inorganic Superhydrophobic Surfaces	$142,833
138703	Feasibility of Nano-Optomechanical Systems (NOMS) for Extreme Environment-Capable Silicon Photonics	$51,031
138705	New Safety Architectures Enabled Through the Use of Advanced Technologies	$143,120
138718	Computational Investigation of Thermal Gas Separation for CO2 Capture	$141,268
138733	QCL for Standoff Explosives Detection	$23,653
138735	Feedback Dynamics of Climate Impacts	$175,918
138738	Quantifying Uncertainty From Material Inhomogeneity	$114,094
138739	Measurement of Systemic Resilience Using an Optimal Control Framework	$81,118
138740	Enhanced Global Strike Target Location and Tracking	$80,379
138804	Advanced Tritium Storage Science	$200,436
138806	Mutual Focusing for Improved Correlation between Radar Images	$72,667
138916	Coupled Femtosecond Spectroscopy	$104,910
138917	Extreme Solid State Refrigeration using Nanostructured Bi-Te alloys	$139,891
138949	Sensor Integration for a Shallow Tunnel Detection System	$82,173
139007	Spectral Beam Combining and Consolidation for High Power Directed Energy Applications	$96,649
139008	Proving the Parallelizability of a New Hashing Algorithm	$44,550
139071	Viscoelastic Coupling of Nano-electromechanical Resonators	$82,391
139073	Understanding Cloud Infrastructure and Capability	$23,437
139074	Enhanced Molecular Dynamics for Simulating Porous Interphase Layers in Batteries	$159,874
139135	Nanostructures from Hydrogen Implantation of Metals	$108,742
139146	Infrastructure for Nondestructive, Real-Time Fingerprinting of Integrated Circuits	$100,193
139147	Approaches for Scalable Modeling and Emulation of Cyber Systems	$190,757
139186	Defensive IO: Understanding and Modeling of Hybrid Threats	$69,753

United States Department of Energy
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SNL - Sandia National Lab

Project ID	Project Name	FY Total
139242	Study of III-nitride Based Photovoltaics	$24,997
139351	Large Scale Structural Armor Development Using High Performance, Cost Effective Materials	$36,826
139352	The Theory of Diversity and Redundancy in Information System Security	$95,046
139353	High-Efficiency (>50%) PV Cells	$98,564
139363	THz Transceiver Characterization	$111,730
139458	Responding to Biological Threats Raised by the WMD Commission Study, World at Risk	$299,078
139459	Electrospun Nanowires for Improved Lithium Ion Battery Anodes	$95,683
139460	Model Framework Development for Penetration Options in the US Energy Supply	$221,154
139461	High-Throughput, Cell-Free Protein Production and Characterization	$45,564
139463	Characterization of Deuterium Ion Beam Operation on RHEPP-1 for Future Neutron Generation Applications	$47,798
139466	Plasmonic Filters	$95,000
139582	Multi-Mission Defensive Space Control Payload	$106,218
139583	Pulsed Laser Microfabrication: Effects of Wavelength and Temporal Length	$50,266
139586	Macro-ions Collapse Leading to Hybrid Bio-nanomaterials	$50,235
139587	Feasibility of Neuro-Morphic Computing to Emulate Error-Conflict Based Decision Making	$86,086
139615	3D Track Fusion Algorithms	$59,109
139707	An Investigation of the use of Ku-Band SAR Technology for Security and Emergency Response' Methods and Phenomenology	$48,966
139708	Development of a System for Identification of Data	$243,937
139861	Microsystems Technology Opportunities for Next-Generation Renewable Energy Systems and the Intelligent Electric Power Grid	$150,787
139863	Reduction of Uncertainties in Remote Measurement of Emissions and Uptake of Greenhouse Gases	$194,761
139864	Collaboration of Nontraditional Networked Devices	$25,160
139865	Exploring Techniques to Analyze High-Level Structures from FPGAs	$34,027
139866	Assessing Vulnerabilities in 3G Cellular Applications	$79,362
139867	Uncertainty Quantification for Large-Scale Ocean Circulation Predictions	$77,227
139929	Establishing Trust Relationships between Hardware and Software Components	$51,712

United States Department of Energy
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SNL - Sandia National Lab

Project ID	Project Name	FY Total
140159	Scalable Circuits to Enable Performance Evaluation of High-performance Computing Algorithms	$23,365
140160	Feasibility of Chip-Scale Integrated Phononic Delay	$60,733
140252	Analysis of Radiological Threat Identification Algorithms	$39,820
140639	Transmutation Claims	$29,030
140640	Automated Verification of Concurrent Systems	$98,921
140641	Uncertainty Quantification of US Southwest Climate From IPCC Projections	$102,695
140642	Optical Nanoscopy using Stimulated Emission Depletion (STED)	$56,435
140764	Quantitative Laboratory Measurements of Biogeochemical Processes Controlling Biogenic Calcite Carbon Sequestration	$103,469
140766	Developing a Cyber Security Systems Methodology for Analysis of Life Cycle Protections	$101,335
141076	Responsive Nanocomposites	$173,127
141078	Thermokinetic/Mass-transfer Analysis of Carbon Capture for Reuse/Sequestration	$81,976
141359	Improved High Temperature Solar Absorbers for use in Concentrating Solar Power Central Receiver Applications	$85,023
141370	Three Pathways to Enhanced Energy Storage	$80,575
141375	Development of a System Design for Remediation of Chemical Weapon Bunkers in Iraq	$67,696
141507	Development, Sensitivity Analysis and Uncertainty Quantification of High-Fidelity Arctic Sea-Ice Models	$35,722
141655	Technologies for Concentrating Solar Power	$58,198
141679	Innovative Electric Power Grid Architecture for High-penetration Distributed Renewable Energy Generation	$38,961
94814	Three-dimensional Analysis for Nanoscale Materials Science	$56,251
95211	Highly Pixelated Hypertemporal Sensors for Global Awareness	$169,554

Total # of Projects for SNL: **406** **Total Cost for SNL:** **$144,785,796**

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report
Project List -- Fiscal Year 2009

SRNL - Savannah River National Lab

Project ID	Project Name	FY Total
LDRD070040	Bimetallic Cathode Catalysts with High Utilization for PEMFC	$155
LDRD070070	Real-Time Airborne Beryllium Particulate Monitor	$1,500
LDRD070103	Separation of the Transuranic Actinides from the Lanthanides Using HDEHP	$-1,807
LDRD070105	High Performance Catalyst Support Materials for Fuel Cells	$-573
LDRD070116	Chemical Reactivity and Phase Behavior of the Pu-Zr System	$-1,027
LDRD070118	Nanostructured Anode Materials for Li-ion Rechargeable Batteries With High Capacity and Inherent Safety	$-6,604
LDRD070137	Enhanced Solid-State Neutron Detection Devices	$19,770
LDRD070151	Advanced Spent Fuel Recycling Technology: Ionic Liquid Electrochemical Extraction	$-559
LDRD070180	Life span of novel biopolymer sequestering agents for organic and inorganic contaminants	$6,527
LDRD070195	Rate of Eutectic Formation in Plutonium/Stainless Steel Couples	$-640
LDRD070203	A System-level Evaluation of Interactions Between Hydrogen Producing Cyanobacteria and their Common Bacterial Associates	$-1
LDRD070212	Systems Microbiology for Energy and the Environment: Structural and Functional Analysis of the Kineococcus radiotolerans genome.	$-1
LDRD-2009-0005	Novel Nanostructured Anode Materials for Li-ion Rechargeable Batteries with High Capacity and Inherent Safety	$159,138
LDRD-2009-0008	Metal Hydride Based Thermoelectric Device	$161,942
LDRD-2009-0010	Nanocrystalline Proton Conducting Ceramics for Hydrogen Separation Membrane Applications	$175,306
LDRD-2009-0013	Evaluation of the long-term effectiveness of enhanced soil remediation with mixed amendments using geochemical parameters and numerical modeling	$161,525
LDRD-2009-0014	Proton Conductive Solid Polymer Electrolyte for Mg-Ni Rechargeable Batteries	$174,444
LDRD-2009-0017	Study of the Local Environment of Glasses Considered for Pu Disposition	$173,696
LDRD-2009-0024	Increasing Efficiency of Ethanol Production Processes by Coupling Waste Treatment to Electricity Production Using Microbial Fuel Cells	$167,237
LDRD-2009-0027	Magnetic Ionic Liquids for Metal Ion Separation	$159,833
LDRD-2009-0030	Interaction of Hydrogen with Bulk Amorphous Microstructures in Metallic Systems: The Fundamental Influence of Materials Chemistry	$157,365
LDRD-2009-0040	Dev of Hydrogen Compatible Ultra-Pure High-Strength Alloy Steels	$164,115

United States Department of Energy
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SRNL - Savannah River National Lab

Project ID	Project Name	FY Total
LDRD-2009-0046	Organo-Boron based Chemistries for Self-Assembly and Growth	$153,108
LDRD-2009-0050	Characterization of an Advanced Solid State Neutron Detection Material	$142,546
LDRD-2009-0056	Sustainable Remediation of Tc-99 Contamination in Groundwater Using Tin Compounds	$146,163
LDRD-2009-0057	Metabolic Engineering of Cyanobacteria for Liquid Fuel Production	$182,911
LDRD-2009-0059	Mechanical and Chemical Delivery of Payloads from SRNL Porous Wall, Hollow Glass Microspheres	$174,783
LDRD-2009-0060	Latex-embedded Cyanobacteria as a Portable Source of Hydrogen	$130,560
LDRD-2009-0062	Impact of Metal Oxide Impurities on Radiolytic Gas Generation	$170,130
LDRD-2009-0071	Evaluation of Humic Amendments to Sustain and Enhance TCE Cometabolism in Dilute-Aerobic TCE Plumes	$110,190
LDRD-QH-2009-013	Integrated System Strategies for Biohydrogen Purification	$67,794
LDRD-QH-2009-016	Infrared Boundary Layer Profiler	$31,682
LDRD-QH-2009-018	Mechanisms of Enhanced Growth in Radiation Fields	$38,913
LDRD-QH-2009-021	Improved Wind Forecasts by Assimilation of Non-Standard Observations with Application to Airborne Contaminant Transport and Wind Energy Production	$49,600
LDRD-QH-2009-024	Assessment of 90Sr and 137Cs penetration into reinforced concrete (Extent of 'Deepening') under natural atmospheric conditions.	$55,966
LDRD-QH-2009-026	Flaw Tolerance and Detection in Composite Pipelines for Hydrogen Delivery	$81,406
LDRD-QH-2009-027	Evaluation of X-ray Photoelectron Spectroscopy (XPS) for Determination of Transition Metal REDOX in Representative Waste Glasses	$48,203
LDRD-QH-2009-030	Electrochemical Separations of Americium with Ionic Liquids	$53,825
LDRD-QH-2009-032	Y-90 for Medical Applications from a Monosodium Titanate Based Radionuclide Generator	$67,150
LDRD-QH-2009-033	Evaluation of mixtures of pervious concrete and sequestering amendments for erosion control and contaminant stabilization	$91,627
LDRD-QH-2009-034	Development of New Antimicrobial Agents	$56,116
LDRD-QH-2009-039	Suitability of Lignin from Switchgrass for the Manufacture of Carbon Fibers	$52,190
LDRD-QH-2009-040	Flowsheet and Cost Analysis of Nuclear-Driven CO2 Capture Process	$54,018
LDRD-QH-2009-041	Investigation of Ce/Eu/Tb activated heavy scintillating glasses containing high rare-earths for nuclear detection technology	$60,443
LDRD-QH-2009-043	High Sensitivity Betavoltaic Cell Radiation Sensors	$58,145

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report
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SRNL - Savannah River National Lab

Project ID	Project Name	FY Total
LDRD-QH-2009-044	Modeling to Support Developmental Design of In-Well Components to Support “In the Injection Well Saturation of CO2 for Geologic Storage”	$60,553
LDRD-QH-2009-049	High-Temperature Direct Methanol Fuel Cell Prototype	$64,171
LDRD-QH-2009-053	Harmonic Detection of Resonance for Evaluating Fischer-Tropsch Catalysts	$64,987
LDRD-QH-2009-054	Fast Neutron Irradiation of Advanced Ceramics for Extreme Environments	$61,662
LDRD-QH-2009-055	Ionogels as Solid Electrolytes for Advanced Battery Applications	$56,644
LDRD-QH-2009-059	Microfabricated Quartz Tuning Fork Strain Gauge as a Rapid Switching, Selective Hydrogen Sensor	$67,055
LDRD-QH-2009-060	Nanotemplating High Surface Area Catalysts for Polymer Electrolyte Membrane Applications	$55,168
LDRD-QH-2009-066	Plume Source Localization by Adaptive Sampling from an Airborne Platform	$37,200
LDRD-SI-FY09/10-005	Nanosize Titanates for Optimized Performance in Separations Science, Innovative Medical Applications and Photochemistry	$35,251
LDRD-SI-FY09/10-015	Development of High Capacity Portable Power Systems	$86,143
LDRD-SI-FY09/10-023	Development of High Capacity Portable Power Systems	$169,581
LDRD-SI-FY09/10-033	The Use of Statistical Downscaling to Project Regional Climate Changes as They Relate to Future Energy Production	$75,036

Total # of Projects for SRNL: **57** **Total Cost for SRNL:** **$4,582,261**

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report
Project List -- Fiscal Year 2009

SRP - Savannah River Plant

Project ID	Project Name	FY Total
SR05029	Synthesis of Metal Hydrides by Mechanical Alloying at Elevated Temperatures in a High Speed Attritor	$2,792
SR07002	Compact ExB Mass Spectrometer for Hydroden Isotopic Analysis	$1,780
SR07005	Stainless Steel Surface Treatments for Mass Spectroscopy Systems	$827
SR07006	Short Range Wireless Sensor Network for Hot Tritium Cell	$4,233
SR07010	Safe Analysis of Tritiated Water from Glovebox Atmospheres and Solidification of the Tritiated Water for SRS Disposal	$827
SR07011	Hydrogen Isotope Recovery Using a Proton Exchange Membrane (PEM) Electrolyzer	$10,133
SR08003	Advanced Catalyst for Cracking and Recovery of Tritium Species - Non-noble Metal Membrane Reactor Technology	$7,836
SR08004	Development of High Voltage Divider/High Resolution Focusing System for Finnigan MAT 271	$102,792
SR08006	Accelerating Testing Methodology for Tritium Compatibility of Stainless Steel	$11,166
SR08007	Non-contact Inspection Technology Development	$2,985
SR08012	Development of a Prototype Non-noble Metal Diffuser	$2,544
SR08016	Standalone Tritium Air Monitor System	$2,672

Total # of Projects for SRP: 12 **Total Cost for SRP: $150,587**

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report
Project List -- Fiscal Year 2009

Y-12 - Y-12 Plant

Project ID	Project Name	FY Total
Y1205040	Large Alpha-Uranium Single Crystals	$46,856
Y1205064	Pin Extensions	$42,167
Y1205086	Mechanical Properties of Uranium at Very High Temperatures	$89,296
Y1205093	Special Casting Requirements	$479,175
Y1205099	Bioassay Analysis by ICP-MS	$102,787
Y1206007	Monitor Tanks and Trays for NMC&A	$177,911
Y1206011	Parametric Study of E-beam Welds	$123,168
Y1206036	Casting Mold Temperature Measurement	$100,813
Y1206057	Advanced Infrared (IR) Heating Techniques for Materials Processing	$192,812
Y1207002	Laser Repair of Casting Defects	$69,393
Y1207018	Dry Vacuum Trap Holdup Monitor	$200,911
Y1207025	Forming and Processing HDPE	$56,405
Y1207030	Wrought-like Cast Uranium	$241,389
Y1207037	Dimensional Metrology Process Development	$152,488
Y1207049	Optical Detection of Alpha Radiation	$75,774
Y1207056	Rolling and Forming U-Mo Foils	$139,159
Y1207065	Advanced Registration and Segmentation of Computed Tomographic Data	$272,112
Y1207082	Uranium Separation and Purification	$263,695
Y1207118	Thermal Conversion of Uranium Oxide	$141,011
Y1207122	Automatic Part Transfer	$30,105
Y1208003	Surface Particulate Cleaning	$213,014
Y1208022	Gasket Material Selection	$148,507
Y1208026	Non-contact Inspection Collaboration with Savannah River Site	$220,899
Y1208054	Robotic Welding	$5,735
Y1208073	Machining Science	$210,852
Y1208077	Improved Dissolution Systems	$239,729
Y1208081	Electrorefining of U Alloy	$263,930
Y1208086	High Temperature Dilatometer Thermal Studies	$76,181
Y1208087	Casting Crucible Improvement	$408,536

United States Department of Energy
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Y-12 - Y-12 Plant

Project ID	Project Name	FY Total
Y1208107	Laser and Machine Marking	$109,990
Y1208125	ThermoMechanical Analysis	$163,360
Y1208141	Heterogeneous Materials Characterization Methodologies	$118,407
Y1208144	Moisture Free Containers	$222,103
Y1208146	Hydrogen in Metals	$197,865
Y1208147	SMO Improved Machining	$74,013
Y1208148	Dielectric Probe for Casting	$170,970
Y1208152	Agile Machining Technologies	$1,507,081
Y1208154	Electrochemical Processing	$69,066
Y1208156	Joining Technology Improvements	$76,239
Y1208157	Alternative Forming Methods	$260,195
Y1208158	Data Diode for Wireless Barcode	$338,056
Y1208161	Infrared Debonding	$65,082
Y1208162	Advanced Structural Dynamics	$307,506
Y1208164	TurboFrisking Mitigation Device	$107,573
Y1208166	Wall Design Evaluation	$218,228
Y1208167	ServoPress 150	$120,975
Y1208168	NMR	$16,927
Y1208169	Mill and Lathe	$153,740
Y1209002	Solid-state NMR Techniques	$361,223
Y1209005	Polymer Barrier Properties	$126,100
Y1209006	Neutron Diffraction Studies of U	$262,508
Y1209007	Boron Phosphide Neutron Detector	$128,817
Y1209008	ESEM Materials Characterization	$216,912
Y1209014	Development of Advanced U Alloy	$99,765
Y1209015	Physical Properties of U - CSM	$173,166
Y1209016	Standardize Metallography-PECS	$139,450
Y1209020	Models for MeV X-Ray Facility	$140,897
Y1209022	Cremless Data Collection Device	$138,013

United States Department of Energy
Laboratory, Plant or Site Directed Research and Development Report
Project List -- Fiscal Year 2009

Y-12 - Y-12 Plant

Project ID	Project Name	FY Total
Y1209026	Lithium Manufacturing Methods	$1,275,459
Y1209028	Carbon Impurity Analysis in U	$254,624
Y1209030	Additional Applications for Agile Machine	$103,965
Y1209031	Pilot Access Authorization System	$183,618
Y1209032	NDE Flaw Detection in Castings	$121,059
Y1209049	Robotic Mopping Alternatives	$33,775
Y1209054	Additional Applications for Robotic Welding	$49,953
Y1209061	Fracture Mechanics in Cast U	$234,740
Y1209066	Impurities' Effects on Recycled U	$256,169
Y1209068	Improved Microwave Insulation	$73,853
Y1209075	HRICPMS	$76,841
Y1209076	Pre/Post Cast U Grain Refining	$119,427
Y1209090	Develop Press Forming Process	$440,976
Y1209092	Amorphous Metal Microwire Sensor	$292,337
Y1209093	Multi-Scale Material Modeling	$28,555
Y1209101	ARF/RF from U Fires	$129,424
Y1209120	Model-Based Metrology	$81,809
Y1209124	Automated Shipping and Receiving	$214,971
Y1209130	Special Material Capability	$131,766
Y1209132	Uranium Mass Flow Meters	$536,973
Y1209133	Diskless / Wireless Technologies	$347,036
Y1209134	Chip and Part Cleaning	$329,833
Y1209135	Special Material Post-Purification Study	$308,831
Y1209147	Wireless Sprinkler Monitoring	$48,076
Y1209149	Robotics and Automation	$57,682

Total # of Projects for Y-12: **83** **Total Cost for Y-12:** **$16,600,789**

Department of Energy
Washington, DC 20585

MAY 0 5 2010

The Honorable Daniel K. Inouye
Chairman, Committee on Appropriations
United States Senate
Washington, DC 20510

Dear Mr. Chairman:

As requested in the fiscal year (FY) 2001 Energy and Water Development Appropriations Conference Report (H.R.106-988), enclosed is the Department of Energy's (DOE's) FY 2009 Report on Laboratory Directed Research and Development (LDRD). This report provides a detailed project history of LDRD activities, as well as information on the funding levels and the impact and importance of the program in advancing the diverse missions of the Federal government.

In FY 2009, DOE National Laboratories devoted approximately $515 million to LDRD in 1,663 projects. Also, included is information on DOE's Plant Directed Research, Development and Demonstration and Site Directed Research, Development and Demonstration programs.

Departmental representatives are available to discuss any questions you may have regarding the information included in this report. If you have questions, please contact me on (202) 586-4171 or Ms. Betty Nolan, Senior Advisor for Congressional and Intergovernmental Affairs, at (202) 586-5450.

Sincerely,

Steve Isakowitz
Chief Financial Officer

Enclosure

cc: The Honorable Thad Cochran
Ranking Member

Department of Energy
Washington, DC 20585

MAY 0 5 2010

The Honorable Byron L. Dorgan
Chairman, Subcommittee on Energy
and Water Development
Committee on Appropriations
United States Senate
Washington, DC 20510

Dear Mr. Chairman:

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Sincerely,

Steve Isakowitz
Chief Financial Officer

Enclosure

cc: The Honorable Robert F. Bennett
Ranking Member

Department of Energy
Washington, DC 20585

MAY 0 5 2010

The Honorable Carl Levin
Chairman, Committee on Armed Services
United States Senate
Washington, DC 20510

Dear Mr. Chairman:

As requested in the fiscal year (FY) 2001 Energy and Water Development Appropriations Conference Report (H.R.106-988), enclosed is the Department of Energy's (DOE's) FY 2009 Report on Laboratory Directed Research and Development (LDRD). This report provides a detailed project history of LDRD activities, as well as information on the funding levels and the impact and importance of the program in advancing the diverse missions of the Federal government.

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Sincerely,

Steve Isakowitz
Chief Financial Officer

Enclosure

cc: The Honorable John McCain
Ranking Member

Department of Energy
Washington, DC 20585

MAY 0 5 2010

The Honorable Ike Skelton
Chairman, Committee on Armed Services
U.S. House of Representatives
Washington, DC 20515

Dear Mr. Chairman:

As requested in the fiscal year (FY) 2001 Energy and Water Development Appropriations Conference Report (H.R.106-988), enclosed is the Department of Energy's (DOE's) FY 2009 Report on Laboratory Directed Research and Development (LDRD). This report provides a detailed project history of LDRD activities, as well as information on the funding levels and the impact and importance of the program in advancing the diverse missions of the Federal government.

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Sincerely,

Steve Isakowitz
Chief Financial Officer

Enclosure

cc: The Honorable Howard P. McKeon
Ranking Member

Department of Energy
Washington, DC 20585

MAY 0 5 2010

The Honorable David R. Obey
Chairman, Committee on Appropriations
U.S. House of Representatives
Washington, DC 20515

Dear Mr. Chairman:

As requested in the fiscal year (FY) 2001 Energy and Water Development Appropriations Conference Report (H.R.106-988), enclosed is the Department of Energy's (DOE's) FY 2009 Report on Laboratory Directed Research and Development (LDRD). This report provides a detailed project history of LDRD activities, as well as information on the funding levels and the impact and importance of the program in advancing the diverse missions of the Federal government.

In FY 2009, DOE National Laboratories devoted approximately $515 million to LDRD in 1,663 projects. Also, included is information on DOE's Plant Directed Research, Development and Demonstration and Site Directed Research, Development and Demonstration programs.

Departmental representatives are available to discuss any questions you may have regarding the information included in this report. If you have questions, please contact me on (202) 586-4171 or Ms. Betty Nolan, Senior Advisor for Congressional and Intergovernmental Affairs, at (202) 586-5450.

Sincerely,

Steve Isakowitz
Chief Financial Officer

Enclosure

cc: The Honorable Jerry Lewis
Ranking Member

Department of Energy
Washington, DC 20585

MAY 0 5 2010

The Honorable Peter J. Visclosky
Chairman, Subcommittee on Energy
and Water Development
Committee on Appropriations
U.S. House of Representatives
Washington, DC 20515

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Sincerely,

Steve Isakowitz
Chief Financial Officer

Enclosure

cc: The Honorable Rodney P. Frelinghuysen
Ranking Member

Department of Energy
Washington, DC 20585

MAY 0 5 2010

The Honorable Henry A. Waxman
Chairman, Committee on Energy
and Commerce
U.S. House of Representatives
Washington, DC 20515

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Sincerely,

Steve Isakowitz
Chief Financial Officer

Enclosure

cc: The Honorable Joe Barton
Ranking Member

Department of Energy
Washington, DC 20585

MAY 0 5 2010

The Honorable Jeff Bingaman
Chairman, Committee on Energy
and Natural Resources
United States Senate
Washington, DC 20510

Dear Mr. Chairman:

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Sincerely,

Steve Isakowitz
Chief Financial Officer

Enclosure

cc: The Honorable Lisa Murkowski
Ranking Member

Department of Energy
Washington, DC 20585

MAY 0 5 2010

The Honorable Bart Gordon
Chairman, Committee on Science
And Technology
U.S. House of Representatives
Washington, DC 20515

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Sincerely,

Steve Isakowitz
Chief Financial Officer

Enclosure

cc: The Honorable Ralph M. Hall
Ranking Member