January 24, 2012

TO: Division Directors and Associate Laboratory Directors

FROM: A. Paul Alivisatos, Director

SUBJECT: Laboratory Directed Research and Development FY 2013 Call for Proposals

With this Call for Proposals, I am initiating the FY 2013 Laboratory Directed Research and Development (LDRD) Program. The LDRD program constitutes one of the principal means to seed innovative science and new research directions.

An important factor in judging proposals will be their support of competencies aligned with the Laboratory's and DOE's strategic directions. Multi-investigator and multi-divisional initiatives are particularly encouraged. Of special significance are cross-disciplinary projects aimed at reducing human interference with the natural carbon cycle, projects from all divisions that advance the boundaries of ultrafast photon science, projects that address the integration of capabilities in the biosciences and the focused application of biological tools, and projects that address the use of large-scale computation and data science. All projects should have: a clearly stated problem (addressing a challenging scientific question, DOE mission, or national need), coherent objectives, and a well-considered plan for leadership, organization, and budget.

For the FY 2013 cycle, we will continue to review a subset of proposals as Laboratory-wide, and these will be reviewed by a broad representation of all senior managers. The second group of reviews for all other proposals in FY 2013 will be for the Divisional LDRD competition. These proposals will be reviewed and assessed this year by Area; i.e. the Associate Laboratory Director (ALD) and the Division Directors within each Area will decide on the ranking of proposals within that Area, and then make recommendations to the Deputy Laboratory Director and Laboratory Director. This second group of reviews for all other proposals may emphasize specific research topics for each area (see detailed instructions). There will not be a Track 2 Discovery review process this year.

The total funding level of the FY 2013 LDRD program should be about $21M for operating and capital equipment expenses (including G&A). Capital equipment funding must support a project that receives operating funds. This Call for Proposals (CFP) will be announced in *Today at Berkeley Lab*, and a copy of this memo will be emailed directly to Berkeley Lab scientists and engineers. The complete call, schedule, guidance, and forms will be available on the Web (http://www.lbl.gov/DIR/LDRD/). All proposals are to be submitted through a web-based submission system that can be accessed via the CFP website.

Proposals should be put into the submission system by Friday, March 23, 2012. If you have questions, or need assistance, email ldrd@lbl.gov.

Attachments

C: Senior, Staff, and Faculty Scientists & Engineers via email (w/o Attachments)
Business Managers
Chief Financial Officer
T. Hansen

Call for Proposals
FY 2013 Laboratory Directed Research and Development Program

Purpose

It is the policy of the Department of Energy (DOE) and the Lawrence Berkeley National Laboratory to encourage innovation, creativity, originality, and quality to keep its research activities and staff at the forefront of science and technology. To further this objective, the Laboratory allocates a portion of its operating funds for Laboratory Directed Research and Development (LDRD), at a level approved by DOE. Under DOE guidelines, LDRD projects shall be in the forefront areas of science and technology. LDRD projects normally are relatively small and also include one or more of the following characteristics:

1. Advanced study of hypotheses, concepts, or innovative approaches to scientific or technical problems.

2. Experiments and analyses directed toward "proof of principle" or early determination of the utility of new scientific ideas, technical concepts, or devices.

3. Conception and preliminary technical analysis of experimental facilities or devices.

Eligible Projects

As indicated above, LDRD funds may be used to support new research directions. Multi-divisional initiatives or single division projects that open new programmatic opportunities are encouraged. A major fraction of the available LDRD funds is targeted for proposals in support of projects with significant potential for growth. Principal Investigators are encouraged to consider and submit proposals that support laboratory initiatives through conceptual studies or proof-of-principle type experiments. Multi-investigator and multi-divisional R&D projects are encouraged; as in the past, we will also fund some outstanding single-investigator research proposals. A proposal should demonstrate the following: a clearly stated problem addressing a national need; coherent objectives; and a well-considered plan for leadership, organization, and budget.

This year, projects that explore integrated, cross-disciplinary approaches for restoring balance to Earth's carbon cycle are particularly encouraged, including projects that involve multiple disciplines and/or that integrate energy analysis or climate modeling with the development of new technologies. Potential technology research areas include energy efficiency, energy for the developing world, carbon capture and sequestration, energy storage, solar photovoltaics, and artificial photosynthesis. These projects are expected to enhance the technical basis for the Carbon Cycle 2.0 initiative, further details of which can be found at: http://carboncycle2.lbl.gov

Projects from all divisions that advance the boundaries of ultrafast photon science are also encouraged. These projects are expected to seed new science programs, initially using existing facilities, but eventually exploiting the unique capabilities of the proposed Next Generation Light

Source (NGLS). Further details for the latter can be found at: http://sites.google.com/a/lbl.gov/ngp (for use only inside lbl.gov).

We also solicit proposals that address the integration of capabilities in the biosciences and the focused application of biological tools to solving problems in energy, environment, and health. These would include measurement tools to open new realms of inquiry and deepen the impact of the biology revolution on other disciplines.

We also intend to fund proposals that address the use of large-scale computation and data science in areas of strategic importance to the lab. Of particular interest are topics related to the management and analysis of large-scale data from the laboratory's scientific facilities. Our reliance on computation will continue to expand while massive data sets will challenge us, and therefore further technical solutions are required.

For the FY 2013 cycle, we will continue to review a subset of proposals as Laboratory-wide, and these will be assessed by a broad representation of all senior managers. The Laboratory-wide proposal review addresses those that generally are more cross-divisional and larger scale, and intended to initiate and/or develop major new strategic directions.

The second group of reviews for all other proposals in FY 2013 will be for the Divisional LDRD competition. These proposals will be reviewed and assessed this year by Area; i.e. the ALD and the Division Directors within each Area will decide on the ranking of proposals within that Area, and then make recommendations to the Deputy Laboratory Director and Laboratory Director. Within each Area, the particular research topics for which proposals are especially encouraged are:

- Biosciences: i) systems and synthetic biology for carbon management and novel chemicals/ materials, ii) environment and epigenomics, iii) development of new analytical tools for biology.
- Computing Sciences: i) data-intensive computing, ii) math applied to new sciences areas.
- Photon Sciences: advancing science areas related to a next generation light source.
- General Sciences: novel scientific ideas, interdivisional proposals, and those topics that could lead to a major new initiative in the General Sciences.
- Energy & Environmental Sciences: i) energy storage, ii) sustainable chemistry and materials, iii) integrated assessment of water-energy-climate interactions, iv) technology for the developing world.

There will not be a Track 2 Discovery review process for FY 2013. If principal investigators who had an FY 2012 proposal funded through that review process wish to apply for a continuation, they should submit through the Divisional review process for FY 2013.

Consistent with DOE policy, it will not be possible to fund construction line-item or maintenance projects, or to increase the budget of projects funded by DOE or other sponsors. This last item is of particular concern; divisions should be careful to ensure that proposals make a clear distinction between the new work and any work discussed in FTP/As. All projects funded by LDRD must meet any applicable Berkeley Lab environment, health, and safety requirements. A decision to fund a proposal identified as multi-year does not create a commitment to provide funding in future years. Proposals for continuation LDRD funding must also be submitted and compete with new proposals. Funding can only be provided for a maximum of three years for any multi-year project, unless approval is given by the Director of the Office of Science in DOE.

Process

The process for LDRD will initially be similar to FY 2012, with proposals to be completed and submitted through the web-based proposal submission system. Oversight responsibility is delegated to the Deputy Director. Administrative questions on LDRD may be addressed to ldrd@lbl.gov.

1. Investigators, with assistance from division support staff as needed, prepare and lock their LDRD forms and pdf of the scientific proposal in the web-based proposal submission system following the Call Schedule.

2. The final proposal will be a pdf file generated in this system consisting of the coversheet, budget page, and scientific proposal narrative. The proposals will be available for review and use by divisional LDRD Point of Contacts, Business Managers, and Division Directors. The system provides options for reviewers at the division level to rank and add comments as desired and specified by the Division Director. The final proposal pdf files will also be accessible to laboratory senior managers and staff for review.

3. Associate Laboratory Directors will choose a review procedure to evaluate and rank proposals in their area. They may solicit expert scientific advice inside and outside of their area in their proposal review. Proposals for all continuing projects must be submitted and ranked along with proposals for new research. In addition, Division Directors and Associate Laboratory Directors must analyze the budget for each proposal and recommend a revised budget if appropriate.

4. Occasionally a proposal will be submitted that is outside the main ongoing interests of a division's research area. These proposals should be flagged to insure they receive attention from relevant laboratory scientists.

5. A subset of the proposals should be proposed by Associate Laboratory Directors to the Deputy Director to be considered as major new directions for a broader "Laboratory-wide" review and selected proposals will receive a special review separate from the balance of the proposals.

6. An ordinal ranking of all other proposals for the Divisional proposal reviews will be submitted by Associate Laboratory Directors as an outcome of their internal area review process.

7. Associate Laboratory Directors will give a presentation of the area proposals to a review committee composed of the Laboratory Director, Deputy Laboratory Director, and Division Directors from the same program area. The presentations will be open to all Division Directors. If deemed necessary, the Laboratory Director or Deputy Laboratory Director may also request the presence and/or advice of other scientific experts. Each Associate Laboratory Director must be prepared to answer questions about all aspects of highly ranked proposals, and make recommendations on final funding level for supported proposals.

8. The Laboratory Director and Deputy Laboratory Director confer with Associate Laboratory Directors for final selection recommendations. They will also ask for additional assessments from scientific managers and experts, possibly external as well as

internal to the lab, on the scientific relevance of self-identified proposals related to the laboratory's major initiatives.

9. After committee reviews of the submitted proposals, the selected projects are subject to EH&S, NEPA/CEQA, and Human and Animal Use review, with review forms completed and necessary approvals done prior to funding and the opening of project accounts.

Required Information

Proposals should be prepared carefully following the given specifications and requirements. A Detailed Proposal Guidance is included with this Call. Proposals must meet the following requirements:

- Proposal length cannot exceed three pages. Figures and references may be included as a fourth page. Any other material exceeding the three-page limit will *not* be forwarded to the reviewers.
- The Cover Sheet and Budget Request forms must be filled out and submitted as instructed through the web-based submission system. Because of external reporting and approval requirements for the LDRD program, it is especially important that all fields on the coversheet are completed. After initial project selections are made, those having submitted successful proposals will be required to return a completed NEPA/CEQA review and Human Subjects/Animal Use forms.
- Proposals must contain clear statements of goals, work to be performed, how work will be done, and who will conduct the research.
- Proposals should describe the significance and value of the work, if successful.
- Proposals for continuing projects must include a statement of progress to date and current fiscal year plans within the three-page limit.
- Budget Requests must include payroll burden and support burden if applicable. Scientific organization burden and procurement burdens must also be included. General laboratory overhead (e.g., general and administrative overhead and site support) estimate should be included as a separate line item.

Schedule

The nominal schedule for the FY 2013 cycle follows. Final detailed scheduling of the review period and any presentations will be arranged by the ALD and/or Director's offices.

FY 2013 Laboratory Directed R&D (LDRD) Proposal Schedule

January 24, 2012	Director issues call for proposals and guidance for FY 2013 LDRD to Division Directors and staff scientists.
March 23, 2012	Principal investigators submit and lock FY 2013 LDRD proposals in the web-based submission system for Division processing. Associate Laboratory Directors initiate area review processes.
March 30, 2012	Associate Laboratory Directors recommend proposed FY 2013 LDRD "Laboratory-wide" proposals.
April 13, 2012	Director's Office issues final specific guidelines for laboratory proposal reviews and presentations as applicable.
April 24, 2012	Review of all Lab-wide proposals
May 4, 2012	Associate Laboratory Directors finalize their rankings and recommendations for the ALD topic areas and any other projects.
May 18, 2012	Reviews for all ALD/Divisional proposals.
July 3, 2012	Director or Deputy Director notifies Associate Laboratory Directors and Division Directors of preliminary FY 2013 awards. Awards will also be announced after the start of the fiscal year in *Today at Berkeley Lab* after DOE approval and authorization to proceed, and after final allocations are made.

Laboratory Directed Research and Development

Detailed Proposal Guidance

Cover Sheet

Project titles should be complete, and indicate what is new and innovative. They should enable reviewers to differentiate between the project and other ongoing research. Generic titles should be avoided, such as "Ceramic Studies" or "Data Acquisition Electronics." Titles should be technically informative and up to 12 words in length. An example is: "Experimental Testing of Novel Mismatch Repair Enzymes for Mapping Natural Genetic Polymorphisms."

Typically, the location of the research should not be included in the title unless the scope of the project bears directly on the facility. Phrases such as "at Berkeley Lab," "at RHIC at Brookhaven," or "at the ALS" normally are not useful. If the project location does have such bearing, it is important to make clear in the proposal the difference between the project and the existing operating program, including the reason the project does not augment the facility's budget. Because LDRD is for conducting actual research rather than establishing organizations, titles and proposals need not refer to the creation of centers or institutes, but rather address the technical context of the project itself.

The purpose and approach statements of the proposal cover sheet will be used for the approval submissions and reports sent to DOE. Thus, these paragraphs should be self-contained and complete, and must fit in the space provided. The form is to be prepared and submitted electronically through the web-based proposal submission system.

Projects that may extend beyond one year should describe what is achievable during each fiscal year. Multi-year projects must compete each year with all other new and continuation proposals, and resubmissions should indicate what is being accomplished during the current year and what is being proposed for the fiscal year under proposal review.

Budget

Narratives and budgets must be consistent. If staff effort and activities are described in the narrative, they must be covered in the budget. LDRD projects cannot be supported by other funds, either DOE or Work For Others. LDRD projects may utilize existing equipment or facilities of the laboratory, and they may acquire or fabricate additional equipment. However, if the scope of the project is to fabricate new innovative equipment, both the operational effort of personnel and purchase of items must be completely covered in the LDRD project budget. LDRD budgets must be able to achieve a self-contained scientific purpose and scope. Thus LDRD projects cannot be proposed solely for the purchase of equipment, since this equipment must be operated to achieve some purpose. However, the preliminary design or prototype fabrication of new equipment may be proposed to extend or develop some new technique, process, capability, etc.

For approved projects, divisions must retain notes or documentation of cost estimates provided in the proposed budgets, following budgetary guidance issued by the Chief Financial Officer. These notes should include the estimates of staffing levels and notes of vendor quotes or catalog references. Notes for funded projects should be held in division files for potential cost validations to be performed by the Department of Energy or other auditors. During proposal preparation, Principal Investigators should retain notes in anticipation of these cost validation requirements. Divisional organization burden is to be included, which is around 16-22%, as well as appropriate indirect costs. The Laboratory's General and Administrative (G&A) and site support burdens are included in LDRD costs, and are not to be redirected to other cost categories.

Please consult with division staff or the Budget Office for specific details of your division's burden rate and indirect charges. LDRD projects have overhead accounts monitored by the Directorate and are not a part of other budget units of the Laboratory. Nevertheless, all staff administering the LDRD accounts must adhere to all financial and cost accounting principles as well as other programmatic requirements applicable to the Laboratory and their division. Monthly cost profiles will be required of all successful projects at the start of the fiscal year.

Proposal Narrative

The proposal narrative is to be a maximum of three pages, though a fourth page of figures and references may be included. It should be a brief, stand alone description of the scientific goal(s) or problem(s), the hypothesis for a solution, and the work to be performed to test the hypothesis. Descriptions should also include the significance and value of the work if successful. There should also be a short discussion of who will conduct the work, and continuing projects must include a statement of progress to-date and future plans within the three-page limit. The proposal will be photocopied in black-and-white and so should be readable, and any figure(s) informative, in such a reproduction. There should be adequate 1" margins for readability and three-hole punch.

A lab-wide Linux cluster computer named Lawrencium is available to the Lab scientific community for general use. Details about the cluster can be found at http://lrc.lbl.gov. If you require access to this cluster for your proposed project, you should include this information in the proposal and estimate the number of node-hours you will be requesting for the fiscal year.

Annual Report

Information for the Annual Report will be requested during the first two months of the following fiscal year. The purpose of the report is to give a brief overview of the project and its general scope of accomplishments to the Department of Energy and senior laboratory managers. The request will call for a Project Description, typically an update and revision to the "purpose and approach" paragraphs of the proposal coversheet, and an additional one to three paragraphs to describe the findings/outcomes for the year. Long, elaborate narratives of methodological details, extensive tabular data, or detailed scientific justification or results, will not be appropriate to this report. Other requirements are a list of published, submitted, or draft papers and reports that are the direct result of project funding, and answers to a questionnaire on program metrics such as people hired and/or invention disclosures. This report is not considered a "publication," rather it is a short synopsis for reporting to government entities on the use of taxpayers funds. Information should not be included in this report that is appropriately reserved for a scientific publication or patent disclosure. The final report is made available to the National Technical Information Service and posted on the World Wide Web.