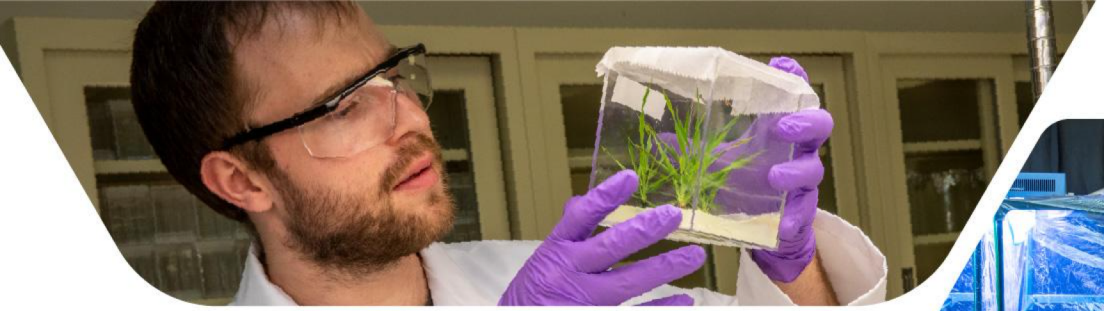


BioSciences

FY23 Laboratory Directed Research & Development (LDRD) Town Hall

December 17, 2021

BERKELEY LAB

U.S. DEPARTMENT OF ENERGY

Inflation is hardest on those facing food insecurity

BioSciences

Inflation is hardest on those already facing food insecurity


US food banks struggle to feed hungry amid surging prices

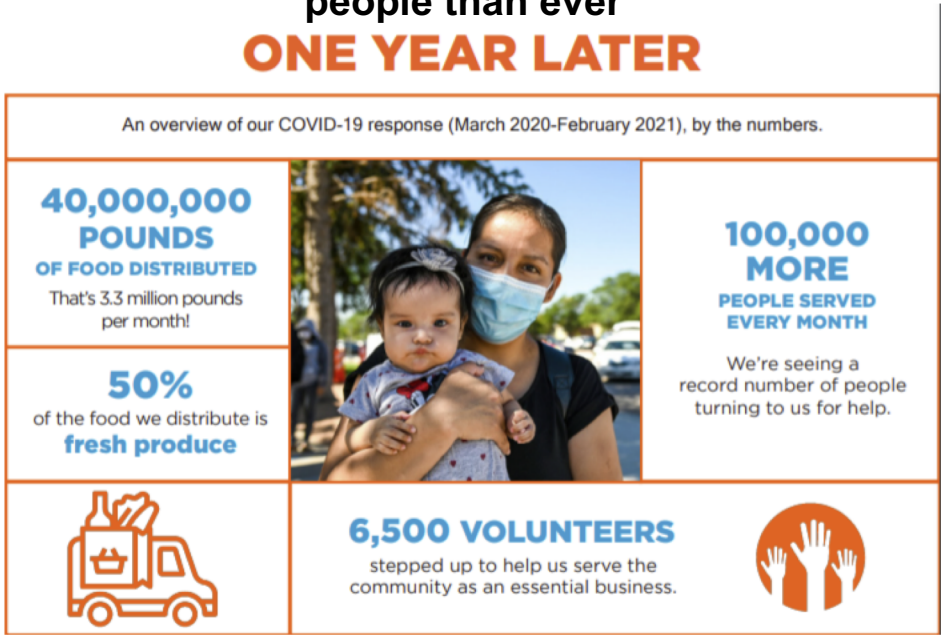
By JANIE HAR November 10, 2021

"*What happens when food prices go up is food insecurity for those who are experiencing it just gets worse*"

-Katie Fitzgerald, chief operating officer of Feeding America

Oatmeal	up 17%
Chicken	up 13%
Canned green beans	up 9%

Our local food banks are serving more people than ever



Our annual food drive is an opportunity to help people in our local communities

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FOOD BANK of Contra Costa & Solano

ALAMEDA COUNTY COMMUNITY FOOD BANK

- **This year's virtual food drive:**
  - BSA teamed up with the Directorate this year
  - Aim to raise more than last year ($135k, ~ ½ Day of expenses for one of the foodbanks)
- **Our local foodbanks are distributing 2x as much food:**
  - helps 1 in 9 residents each month. **1 in 4 are kids.**
  - distributed 40 million pounds of food last year (vs. 24M year before); over 50% was fresh fruits and vegetables
  - "rescues" food that may otherwise have been discarded, or left in the field

You can have a major impact on your neighbors in need this holiday season

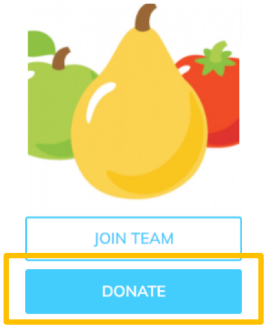
With 96 cents of every $1 donated going towards food distribution, we consistently earn Charity Navigator's highest four-star rating.

It is very easy to contribute

https://sites.google.com/lbl.gov/food-bank-2021/home

FOOD BANK of Contra Costa & Solano

https://give.foodbankccs.org/team/395693



ALAMEDA COUNTY COMMUNITY FOOD BANK

https://www.vfd-accfb.org/grouphome.aspx?ID=8048

Current Drive: Virtual Food Drive

Team Name	Goal	Total so Far	
ETA + EHS + Directorate	$5,000.00	$1,362.50	Shop/Donate
Biosciences + Ops Directorate	$5,000.00	$1,338.00	Shop/Donate
PSA + PIMD	$5,000.00	$630.00	Shop/Donate
EESA + CFO + FAC	$5,000.00	$300.17	Shop/Donate
CSA + HR + IT	$5,000.00		Shop/Donate
ESA + ALS-U + SES	$5,000.00		Shop/Donate

The Agenda

- What are LDRDs?
- Biosciences Area (BSA) LDRD Requirements
- BSA FY23 LDRD Topics
- FY23 LBL Multi-Area Topics & Process
- IDEA Statement
- Early Career Development (ECD) LDRDs
- Area Process
- LDRD Do's & Don'ts
- Questions

What are LDRDs?

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LDRD projects shall be in the forefront areas of science and technology…and should 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 analysis directed towards "proof of principle" or early determination of the utility of new scientific ideas, technical concepts, or devices.

(3) Conception and preliminary technical analyses of experimental facilities or devices.

LDRD Project Periods

- A standard LDRD is 24 months
  - Any requests for a standard LDRD beyond 24 months *(up to 36 months)* will need to qualify for exception and will be reviewed as a new LDRD

- An Early Career LDRD can be up to 36 months

- Projects less than 24 months are encouraged!

Biosciences Area Requirements

- Successful proposals will align with some or all of the following:
  - Biosciences Strategic Plan - Looks Ahead to 2028
  - Berkeley Lab COVID-19 Strategic Plan - DOE mission alignment sections
  - DOE BER Biological Systems Science Division (BSSD) Strategic Plan
  - National Academies reports
  - Other strategic and forward looking documents

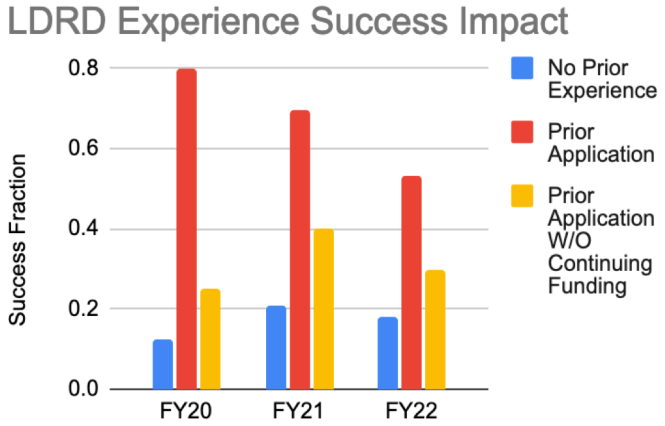
- Successful proposals **must** include thoughtful Inclusion, Diversity, Equity, and Accountability (IDEA) Plans

Feedback and retrospective analysis informed topics and guidance

Biosciences is continually improving its LDRD process

- For FY23, incorporated new feedback and additional analysis of past LDRDs

LDRD analysis included past information and interviews with former applicants



Interview findings

- Applying for an LDRD and going through the process improved overall proposal writing skills
- Mentor and/or peer feedback improved proposals
- Interest in additional general LDRD information and preparation sessions

FY23 Biosciences Topic Development Process

- Feedback from FY22 indicated that Deputies and Department Heads were interested in suggesting new LDRD topics for Biosciences
- In October, Directors, Deputies, and Department Heads participated in a brainstorming session for FY23 topics
  - Generated at least 8 potential topics
  - Streamlined topics since many were related or overlapped
- Suggestions were synthesized to develop more general topics relevant to multiple Biosciences units
  - ALD, Area Deputies, and Directors reviewed and refined the FY23 topics to finalize
- New this year: dedicated topic to encourage emerging research that is strategic for Biosciences and Berkeley Lab

FY23 Biosciences Area LDRD Priorities

Area LDRDs are encouraged in new “breakthrough” science areas. The particular research topics for which proposals are especially encouraged in Biosciences are:

- Self-Driving Labs*
- Computing, Analysis, & Data Management*
- Carbon Smart Biomanufacturing
- Predictive Biology
- Emerging Research

Area Priorities – Self-Driving Labs*

Experimental and computational research and engineering to enable automated experimentation. Areas of interest include:

- Developing algorithms for remote control of instrumentation
- Developing algorithms that can adapt experimental conditions without human intervention
- Developing technologies for miniaturizing lab processes or increasing throughput
- Developing robust and networked sensors for monitoring biological experiments
- Developing workflows, protocols and programming interfaces for linking automated unit operations
- Engineering automation pipelines for precise control of experimentation

[POCs: Nigel Mouncey & Junko Yano]

Area Priorities – Computing, analysis, and data management*

New approaches for biological computing, data analysis, and data management that meet FAIR data principles, create standardized workflows, enable AI/ML, and organize data for future analysis. Areas of interest include:

- Developing standardized workflows for integration of different types of data
- Developing methods for multiscale analysis of biological phenomena and processes
- Developing and applying AI/ML approaches to gain non-intuitive insight into biological phenomena and processes

[POCs: Junko Yano & Nigel Mouncey]

Area Priorities – Carbon Smart Biomanufacturing

Research and development to efficiently use carbon as a feedstock (from biomass, waste, and/or gases) for biomanufacturing and/or biomanufacturing to develop net-neutral or net-negative products derived from carbon feedstocks. Areas of interest include:

- Developing biomanufacturing processes to use diverse feedstocks (biomass, waste, plastics, gases, etc.) that maximize carbon efficiency
- Developing processes that increase the availability of usable carbon from diverse feedstocks for microbial or plant bioprocesses
- Developing processes to create plant- or microbially-derived products (fuels, chemicals, materials) that do not contribute to carbon emissions or reduce carbon emissions (e.g. durable goods for carbon storage)
- Strategies to maximize retention of feedstock carbon through biomanufacturing

[POC: Blake Simmons]

Area Priorities – Predictive Biology

BioSciences

Research and development of experimental and computational capabilities to enable accurate predictions of biological processes and phenomena, as well as possible interventions.

Areas of interest include:

- Predicting function from gene sequence
- Predicting enzyme structure and substrates from sequence
- Predicting microbiome functions and dynamics to enable microbiome manipulation and engineering, e.g. for improved plant resilience
- Predicting and modeling interventions for soil carbon restoration and storage
- Predicting responses to disease and other health outcomes

[POCs: Susannah Tringe & Blake Simmons]

Area Priorities – Emerging Research

While the above topics represent strategic priorities for Biosciences and Berkeley Lab, proposals for emerging and nascent research topics of potential strategic interest for Biosciences are encouraged. Proposals **should address the following questions**:

- What is unique about this research area and proposal?
- Does this topic represent a new area of growth for Biosciences that builds on our strengths as a national lab?
- How does the proposal foster team science and reflect Berkeley Lab's stewardship values?
- What is the strategic opportunity for Biosciences, Berkeley Lab, the National Lab complex, and/or the U.S. research enterprise?
- Emphasize evidence for strategic importance: Biosciences Strategic Plan (in the Looks Ahead to 2028), Berkeley Lab priorities, strategic documents from potential funders, National Academies reports, and other resources
- What is the title of this new research area or strategic focus?

[POC: Katy Christiansen]

FY23 Multi-Area Topics

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Berkeley Lab leadership encourages multi-Area LDRD proposals developing capabilities in general domains. The intent of this track is to encourage and support research initiatives that are being pursued across Areas and that incorporate one of the three topic areas.

- Automation in the Acquisition and Management of Experimental Data (Lab Automation)
- Data Science/Machine Learning to Accelerate Science
- Instrumentation to Advance Fundamental and Applied Science

Multi-Area Project Requirements & Opportunities

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- Proposals should have a lead division/area PI who will submit the proposal & are responsible for submitting a full budget for ALL participating Areas.
- Proposals need to undergo coordinated review with leadership from ALL involved Science Areas.
- Funding will be contributed by each PI's/Co-PI's home Area carve out based on the technical contributions from each Area.
- Up to a maximum of $100K of total pre-site support funding will be contributed by the Directorate for a select number of Multi-Area projects *(as determined by Lab leadership)*, with the possibility of more in very exceptional cases.

Multi-Area Topic - Automation in the acquisition and management of experimental data (Lab Automation/Self-Driving Labs)

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LBNL seeks proposals that investigate, develop, and use technologies to automate discovery science, including through the next generation of advanced instrumentation and user facilities/centers at Berkeley Lab. The proposals may approach this from:

- The fundamental stage: i.e., building out core level technologies and tools to assist with general lab automation,
- The applied perspective: i.e., reimagining the application of lab automation tools to research, or
- A combination of the two

[POCs: Nigel Mouncey & Junko Yano]

Multi-Area Topic - Data Science/Machine Learning to Accelerate Science

BioSciences

LBNL seeks proposals that build on (and extend) innovative approaches to the management and use of datasets to extend our understanding of underlying science in areas of importance to Berkeley Lab. The proposals may approach this from:

- The fundamental stage: i.e., building out core level algorithms and methods to enhance data science, analysis, and machine learning
- The applied perspective: i.e., applying or re-engineering existing DS/ML methods and techniques to solve applied problems in novel ways, or
- A combination of the two

[POCs: Junko Yano & Nigel Mouncey]

Multi-Area Topic - Instrumentation to Advance Fundamental and Applied Science

BioSciences

LBNL seeks proposals to develop innovative instrumentation in sensing, measurement, readout and data acquisition that will advance fundamental and/or applied scientific opportunities at Berkeley Lab. Multi-Area collaborations are encouraged in pursuit of:

- Advanced instrumentation to bring unique capabilities to bear on priority scientific research.
- Needed investments in technical infrastructure in support of instrumentation R&D.

[POC: Junko Yano]

Inclusion, Diversity, Equity, Accountability (IDEA) Statement

The IDEA statement should:

- Describe your past experience and activities,
- Describe your future plans to advance diversity, equity, inclusion and accountability
- Reflect the diversity of California as well as meet the educational needs and interests of Berkeley Lab's diverse population.

Some candidates may not have substantial past activities. If that is the case, we recommend focusing on future plans in your statement.

IDEA Statement – Past Experience

Describe any past experience or background that has made you aware of challenges faced by historically underrepresented populations.

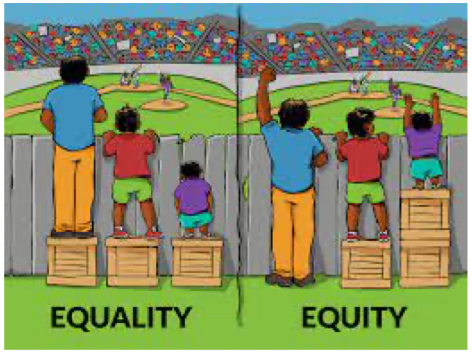
- Mentoring: Mentorship of students, post-docs, staff or researchers from underrepresented groups
- Committee Service: Service on a committee or board that focused on diversity, equity, and/or inclusion, describe the committee's accomplishments and your role in helping achieve them
- Other Activities: Describe the activity and its context (e.g. a specific conference or organization, student retention or outreach activity, course development to reach a specific group, outreach to a local school, or work with a diversity-related non-profit).

IDEA Statement – Planned Activities

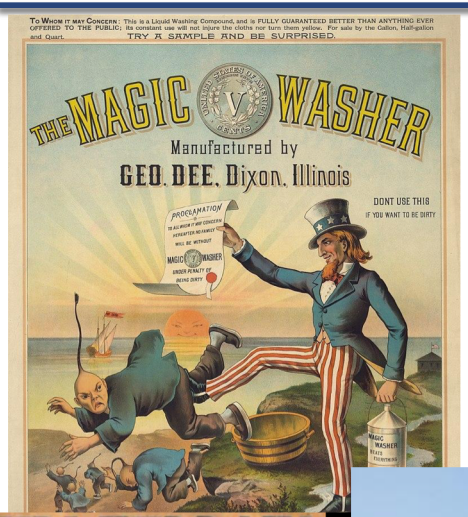
Describe activities you will engage in at Berkeley Lab, including:

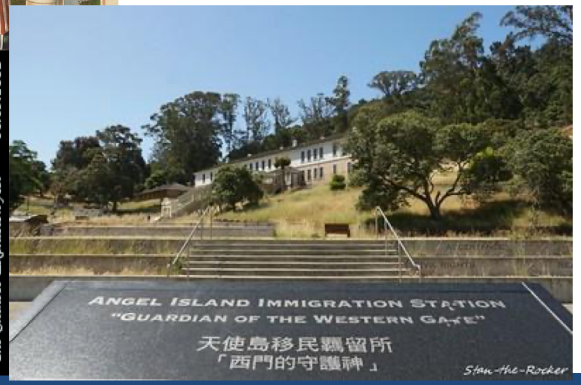
- The role you envision having and what you would like to accomplish in the next two years.
- Who would you like to engage in your efforts, and how would you plan to engage them?

Be as specific as possible, but realistic in terms of your effort and time commitment.



Thomas Eng's - IDEA Presentation





LAMBDA ALLIANCE

Supporting a diverse workforce
1 Native American hire, 1 Chinese-American hire, 1 first generation US citizen, 1 new-immigrant

Out of recent 9 undergraduate trainees, 6 are female

I have increased the visibility of JBEI research by conducting JBEI site visits, professional research conferences, and an internal JBEI wet-lab demonstration for the building operations group. I also volunteer on diversity and outreach panels to under-represented minorities in STEM fields on behalf of the Biosciences Area and JBEI. As a bystander in the lab environment, I have intervened when witnessing discrimination and bullying in the workplace.

Early-Career LDRDs

BioSciences

- The intent of the Early Career Development (ECD) track is to develop the future scientific workforce and prepare early career PIs for a successful scientific career.

- An ECD LDRD grant is intended to be a first opportunity for an early career scientist to develop a PI experience at a national lab and prepare for a DOE Early Career Grant application.

- Considering the future scientific workforce of LBNL, it is a goal of the laboratory to develop a diverse group of early career scientists. Applications from underrepresented and other employee groups are very much encouraged.

- A maximum funding amount not to exceed $450,000 over 3 years is permitted. The FY23 proposal budget request should reflect only the amount being requested for that fiscal year.

Early-Career LDRDs – Key Info

- For those wishing to submit under the Early Career track, eligibility is open to those who received their Ph.D. no earlier than January 1, 2014.

- Current postdocs and project scientists are encouraged to submit proposals, and if successfully funded, must have a scientific job title (career or career track, research scientist or staff scientist) before the project starts.

- The supervisor, deputy, and division director will work with the successful Early Career PI to develop a mentoring plan.

The Process – Area Review Criteria

BioSciences

All proposals will be evaluated on the basis of the following criteria:

- Approach
  - Clear, well-reasoned, and logically planned
- Impact
  - Intellectual merit and potential for a broader scientific impact, and long-term benefit to society
- Innovation
  - Interesting and compelling; is innovative in its field, uses innovative approaches, concepts, or advances our technical capabilities
- Prospect for Follow-on Funding
  - Shows promise for future external funding

The Process – Area Review

- Feedback to pre-proposals and initial presentations will be provided by division/facility leadership
- If a proposal aligns more closely to an Area outside of Biosciences, talk to your division director or deputy and ensure that you have the support of the appropriate ALD, division director, or deputy so they can review, offer feedback, and if necessary, champion your project.
- Advancement of LDRDs seeking a 3rd year of funding is available only in *outstanding and exceptional* circumstances. They will be evaluated against new start proposals.

The Process – Area Review *(cont.)*

- Top five (5) proposals from each division/facility selected to present to Area Leadership (*ALD, Directors, Deputies/Department Heads*)
- New proposals are evaluated against other new proposals and requests for third-year continuing projects.
- The top proposal from an Early Career Researcher will be selected as the Early Career representative for the Biosciences Area
- A subset of proposals will be recommended to Lab Leadership for funding
  - # of proposals will be based on funding target provided by the Directorate
  - In FY22, 20% of the 38 new BSA proposals were approved for funding

LDRD Project DO's

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- DO put forward ONE proposal as lead PI
  - Focus and make your proposal tight
- DO confirm collaborator participation early to ensure they are available & interested in the collaboration and to ensure that your budget is accurate - and get your collaborators to engage with their leadership
- DO contact a Resource Analyst early to begin developing your budget
- DO be thoughtful about your IDEA statement
- DO develop your presentation for a broad audience
- DO work with your division/facility leadership to polish your proposal and presentation

DO'S

LDRD Project DON'Ts

- DON'T wait until the last minute
- DON'T go it alone
  - Directors, deputies, and department heads are here to help you
- DON'T list people as collaborators that you have not spoken to
- DON'T assume your collaborators have spoken with their leadership
- During your presentation, DON'T assume that everyone knows what you know
- DON'T give a generic IDEA statement or rehash text from the IDEA website

The Timeline

Activity	Due Date
• 300-word Pre-Proposals Due	• Late January - Early February
• Leadership review of pre-proposals	• Late January - Mid February
• Feedback communicated to PIs	• No later than February 28, 2022
• Oral presentations to Division Leadership	• late February – early March
• **Proposals submitted and locked in lab system**	• **March 25, 2022**
• Area presentations	• April 6th, 13th, 14th
• Lab presentations	• May 9 – 10, 2022
• ALDS notified	• July 1, 2022
• PIs notified	• September 1, 2022 *(no later than)*

New! How to develop your LDRD presentation Info Session

Want to give a great LDRD presentation? Then come to the upcoming information session to discuss:

- Audience
- Content
- Framing
- Differences between LDRD presentations and scientific presentations
- And more…

Stay tuned for more details on the info session in early February!

QUESTIONS?