



Discoveries in Safety Grants

Electrochemical Safety Research Institute

Increased Safety for Large-scale Lithium-ion Battery Systems Notice of Funding Opportunity | [Apply Here](#)

Letter of Intent Due Date (*required*) (due by 11:59 p.m. E.S.T)

February 16, 2024

Full Proposal Deadline (due by 11:59 p.m. E.S.T)

May 10, 2024

Program Overview

Electrochemical Safety Research Institute (ESRI) of UL Research Institutes is interested in research on advanced gas sensors to detect early stages of cell venting in lithium-ion multi-cell modules.

Summary of Program Requirements

This document contains all relevant information related to the Discoveries in Safety Grants Program. The most important information regarding deadlines, eligibility, and award information can be found below and in the respective sections.

Key Dates:

LOI Application Period: December 11, 2023 to February 16, 2024 (due by 11:59 p.m. E.S.T.)

Applicant Question Period: December 11, 2023 to January 19, 2024

Applicant Informational Webinar: January 26, 2024

Full Proposal Application Period: April 1 to May 10, 2024 (due by 11:59 p.m. E.S.T.)

Research Projects Begin By: September 1, 2024

Who Should Submit Proposals:

All proposals should be submitted by an accredited college, university, government, or non-government organization (including not-for-profit and for-profit institutions) with recognized legal status in their respective country.

Award Information:

Type of Award: Competitive grant

Number of Awards Given: up to 2

Funding Amount: up to \$200,000 a year

Duration of Award: 3 years

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I. Introduction

The purpose of this funding opportunity is to enhance the mission of UL Research Institutes (ULRI), a nonprofit research organization dedicated to advancing public safety through scientific discovery. Since 1894, our research has advanced our mission toward a safer, more secure and sustainable future. Focused on global risks from fire mitigation and air quality to safe energy storage and digital privacy, we conduct rigorous independent research, analyze safety data and partner with experts to uncover and act on existing and emerging risks to human safety. Discover more at [UL.org](https://www.ul.org).

To meet today's urgent global safety risks, ULRI has set out to address three grand challenges: (1) Building resilience for a sustainable future, (2) Advancing individual and societal health in the 21st century, and (3) Promoting safety at the human-digital interface. In this inaugural grant-making cycle, ULRI aims to further the progress of safety sciences by providing grants, thereby continuing the quest to address global challenges and create a safer world.

II. Background

Electrochemical Safety Research Institute (ESRI) of UL Research Institutes is dedicated to advancing safe energy storage through discovery-driven research. With renewable energy's growing importance, our scientists explore and address safety issues in batteries. Our work benefits the entire energy storage chain, promoting safety awareness and best practices. We understand that partnering with experts is vital for creating a safer and more sustainable world, where our collective efforts drive positive change. We engage in scientific research independently as well as in partnership with esteemed research institutions and leading experts. Our commitment to transparency drives us to disseminate this knowledge to scholars and industry leaders, setting benchmarks and offering guidance for the responsible advancement of products and emerging technologies.

III. Grant Purpose

ESRI is interested in funding proposals that focus on monitoring designed to permit detection of possible thermal runaway of li-ion batteries. This may focus on gas sensing capability of small volumes of early release or large volumes that are released from li-ion batteries at various stages of thermal runaway. The preference is for dynamic gas sensing capability as the nature and volume of the gases can change with time as the battery continues to burn. An understanding of the scale of the event should be exhibited. This type of information will be very informative for prevention of full thermal runaway as well as for first responders and fire fighters to tackle large scale li-ion battery fires.

Applications for lithium-ion (li-ion) cells has increased exponentially in the past three decades with its use in battery systems ranging in size from 10s of kWh (typically used in electric vehicles) to MWh and GWh (typically used in stationary grid energy storage systems) becoming more common. However, the complexities of such a large battery system have challenged the safety of these installations. Lack of stringency at every stage of manufacturing as well as the inadvertent exposure to off-nominal electrical, mechanical, or thermal faults has caused these systems to experience catastrophic events.

Research has also indicated that lithium-ion cells are typically designed to vent the initial accumulation of gases and there may be a time gap between this initial venting and the final thermal runaway of the cells. It is possible to mitigate the thermal runaway if a good sensing of the gases emitted during venting is provided as mitigation strategies such as sudden cooling of the entire system can be initiated to prevent the catastrophic event from occurring. Dynamic gas sensing techniques can provide advance warning remotely to first responders and fire fighters on what can be expected with respect to trapped toxic and combustible gases when they have to deal with the large electric vehicle or energy storage systems fires.

IV. Award Information

Type of Award: Competitive grant

Number of Awards Given: up to 2

Funding Amount: up to \$200,000 a year

Duration of Award: 3 years

V. Eligibility Information

Who Should Submit Proposals:

All proposals should be submitted by an accredited college, university, government, or non-government organization (including not-for-profit and for-profit institutions) with recognized legal status in their respective country.

At ULRI, diversity, equity, and inclusion (DEI) are critical to who we are and what we represent as a leading safety science organization. We believe that our inclusivity fuels brilliance in innovation, creative problem-solving, and, ultimately, excellence in safety science discovery. Learn more about ULRI's commitment to DEI [here](#).

ULRI encourages proposals from, or collaborations with, diverse research teams, including minority-serving institutions (MSIs), Historically Black Colleges and Universities (HBCUs), Hispanic-Serving Institutions (HSIs), Tribal Colleges and Universities (TCUs), and other institutions with a predominantly underrepresented student population.

Who May Serve as PI:

The Principal Investigator (PI) must be an individual of the organization holding a full-time administrative or faculty role. The PI should continue in this role for the duration of the three years of the award. Multiple PIs can be added during this time.

The PI must NOT be:

- From a country under U.S. export control or sanctions;
- A previous employee of UL Solutions, ULRI, or UL Standards & Engagement (ULSE) within 12 months prior to submitting a Letter of Intent for this program.

VI. Proposal Preparation and Submission Instructions

A. Key Dates

LOI Application Period: December 11, 2023 to February 16, 2024 (due by 11:59 p.m. E.S.T.)

Applicant Question Period: December 11, 2023 to January 19, 2024

Applicant Informational Webinar: January 26, 2024

Full Proposal Application Period: April 1 to May 10, 2024 (due by 11:59 p.m. E.S.T.)

Research Projects Begin By: September 1, 2024

B. LOI Requirements

A Letter of Intent (LOI) is a required document needed from all applicants who are interested in receiving funds from this program. The LOI will be submitted through ProposalCentral and reviewed by ULRI's team of reviewers to determine if a full proposal will be requested from the submitting organization.

LOIs must be submitted on or before **February 16, 2024** through ProposalCentral. Invitations to submit full proposals will be communicated to applicants via ProposalCentral by April 1, 2024

ULRI requests the following items be included in the LOI:

Section 1: The following information will be submitted directly into ProposalCentral

1. Project Title

2. Project Director/Principal Investigator Background*
3. Co-Project Director/Principal Investigator Background*
4. Organization Information
5. Nontechnical Project Abstract

Section 2: The following information will be submitted as an attachment into ProposalCentral (limited to a total of 3 pages uploaded within a single PDF file)

1. Narrative Prompts:

- A brief statement about the nature and purpose of the proposed project
- A description of the proposed work to be supported and any unique aspects and pilot studies being pursued
- A brief overview of the methodologies proposed
- A brief overview of the outputs and expected outcomes of the proposed project

2. Budget Prompts:

- An estimate of the total cost of the project
- The amount requested of ULRI
- An estimate of the duration of the project

C. Full Proposal Requirements

After LOIs are reviewed and selected, applicants advancing in the process will be invited to submit a full proposal. The full proposal will be submitted through ProposalCentral and reviewed by ULRI's team of reviewers to determine if a grant will be awarded.

Proposals must be submitted on or before **May 10, 2024** through ProposalCentral

ULRI requests the following items be included in the full proposal:

Section 1: The following information will be submitted directly into ProposalCentral

1. Project Director/Principal Investigator
2. Co-Project Director/Principal Investigator
3. Organization Information
4. Proposal Narrative
5. Budget
6. Budget Summary and Detailed Template
7. Diversity, Equity, and Inclusion

* This information will be held strictly confidential and will be used for the sole purpose of helping ULRI evaluate our grantmaking and efforts to reach the broadest applicant pool.

Section 2: The following information will be submitted as an attachment into ProposalCentral (limited to a total of 15 pages uploaded within a single PDF file)

Narrative Prompts:

1. What is the research question? What is the significance of this question?

In a brief statement, outline the proposed research question and the importance of answering it. Include factors like the broader societal implications that this research question aims to address and the role of this research in advancing the field of safety science.

2. What is the research project? What are the goals and methodologies?

Present an overview of the planned research project. This overview should include:

- An outline of the specific tasks to be carried out
- The project's objectives and how they align with the current research landscape
- The research methodologies to be employed

The narrative should convey answers to the following questions:

- What do the proposers intend to accomplish in the research project?
- Why is the project significant?
- How do the proposers intend to execute the project?
- How will the proposers gauge the project's success?
- What are the potential outcomes?

Applicants should document any crucial assumptions, strategies, and techniques. The discussion may encompass theoretical frameworks, data sources, experimental apparatus, analytical approaches, and other relevant particulars, depending on the nature of the research.

The explanations presented in the narrative should be understandable to an educated and interested nonspecialist audience. For more advanced technical details, you can include an Empirical Research Methods Appendix, as outlined in Appendix 1.

3. Who are the principal members of the research team?

Introduce the principal members of the research team and provide the following information for each:

- Their responsibilities in the project
- Any notable achievements, qualifications, or expertise pertinent to their designated roles

Detailed information about the project team member, such as their educational background, awards, or publication history, should be reserved for Appendix 2.

4. What is the summary justification for the funding request?

Provide a broad overview of the rationale for the budget request, explaining its alignment with the research and the expected outcomes it will facilitate. More detailed explanations can be provided in the "Budget Summary and Detailed Template" section within ProposalCentral.

5. Are there any additional research funding sources that the proposer has sought or secured to support the research project currently being proposed to ULRI?

If the research project is seeking or has obtained funding from other sources, please provide a list of the sources along with the following information:

- Funding amounts
- Status of funding from each

6. What other research support, both 'Current' and 'Pending,' does the proposer currently have aside from the ULRI research project?

If the proposer is currently receiving or has pending support from other sources, please provide the following information:

- Title of Project/Proposal
- Funding Source
- Total Award Amount
- Amount Awarded to the Principal Investigator
- Duration of the Award
- Project Location
- Brief description of the research in relation to this proposal

7. What is the work plan?

The proposal narrative should address the project's timeline and its implementation including details about:

- Task allocation
- Project oversight
- Roles and responsibilities of the team members
- Important project milestones
- Criteria for measuring success
- Potential risks associated with various aspects of the work plan along with the corresponding risk mitigation strategies
- Outline of the involvement and expected contributions of a collaboration with external individuals or organizations, if applicable
- Current project status, if applicable

8. What are the anticipated outcomes of the research project?

The proposal narrative should include the following:

- An overview of the expected research outputs
 - Could encompass publications, datasets, participation in conferences, educational activities for students, and postdoctoral researchers
- An outline of the dissemination strategy to be employed throughout the project
- Measurable criteria for the outputs, if applicable
 - What would signify success? (i.e., target publication venues, software download counts, conference attendance numbers, etc.)

A more detailed discussion of the projected research outputs should be included in Appendix 3.

9. What is the existing body of literature regarding the research question(s)?

Provide an overview of the existing body of literature related to the research question(s) under consideration. Elaborate on how the proposed project aligns with, complements, or expands upon this existing research, referencing pivotal publications within the field, while also pinpointing areas where the literature lacks coverage. The literature review should encompass significant works authored by the proposer(s) as well as other experts in the field.

10. What is the status and the outcomes of grants previously awarded by ULRI?

This question is only applicable to current or former ULRI grant recipients requesting funding for a new project related to their prior ULRI grant, or when they are seeking renewed or expanded support for an ongoing ULRI-funded project.

Provide an overview of the achievements resulting from prior ULRI grants, including a compilation of publications (i.e. working papers, journal articles, books, Ph.D. dissertations, etc.) and other outputs (i.e. conferences, presentations, films, training, etc.) that have been identified as measurable outcomes from current and/or previous grants.

11. Appendix 1 – Empirical Research Methods

Grant proposals requesting support for research should include a comprehensive methodological discussion as an appendix. ULRI enlists external experts to assess proposals, therefore applicants should anticipate a high level of scrutiny and should tailor their responses for a subject matter expert audience.

The Empirical Research Methods appendix should encompass the following:

- Intricate and technical details concerning research design, data or sample collection, and instrumentation, if applicable
- Approach to analysis and validation
 - Include specifics like power calculations and preregistration plans, if applicable
- A thorough account of the structure, functioning, and criteria for using models employed in the research process

For proposals related to qualitative research include descriptions of:

- Research design
- Data collection methods
- Analytic approaches
- Interview, survey, and data collection protocols

In cases where projects generate data, models, or code meant for use by others, include the following:

- Specific individuals or groups intending to utilize such products
- Their willingness to collaborate with the investigators to ensure that the products meet their requirements

For data sets that are confidential, proprietary, or have other sensitivity considerations, provide the following:

- An outline of the measures to safeguard the interests of third parties.

Research raising ethical concerns should undergo review by an Institutional Review Board or a similar independent body responsible for safeguarding the rights and welfare of human subjects. Please indicate when such a review has been completed or is planned when responding to this question.

12. Appendix 2 – Curricula Vitae

Include an abbreviated version of each research team member's C.V. or biography. The C.V. should include the following information:

- Education
- Employment History
- A list of the proposer's most important previous publications
- Important honors

13. Appendix 3 – Research Outputs

Please provide a structured list of all anticipated research outputs to be generated with ULRI funding for the purpose of dissemination of information and replication of research. This list should encompass details regarding:

- Articles, books, websites, and other creative works
- Datasets
- Instruments and other hardware
- Software, encompassing models, computational notebooks, instrument control systems, and application

D. Submission Instructions

ProposalCentral:

Both the LOI and full proposal (for those applicants whose LOIs are accepted) will be submitted through ProposalCentral. Below you will find information on how to navigate the platform. If an applicant is having difficulty utilizing ProposalCentral or have any questions about the platform, please use the ProposalCentral contact listed in the Contact section of this document.

- [Home Tab Overview](#)
- [Setting up Your Professional Profile](#)
- [Institution Profile Management - Creating a New Profile](#)
- [Institution Profile Management - Searching for a Profile](#)
- [Direct Link \(Multiple Applications\)](#)
- [Key Personnel Demographics](#)
- [Validate Button tutorial](#)
- [e-signatures](#)
- [Proposals – accessing and editing applications, searching for previous applications](#)

This document contains tutorial videos demonstrating various ProposalCentral Processes. The content may differ from the current version of ProposalCentral and is subject to change. These video tutorials are the property of

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ULRI requests that all documents that are submitted as an attachment to the applications in ProposalCentral follow the below format:

- No longer than 3 pages maximum for the LOI or 15 pages maximum for the full proposal
- 11-point font or larger
- At least 0.5" margins
- Single line spacing
- Arial or Times New Roman font
- PDF filetype
- Please do not include a cover sheet with your proposal

Submitting requested documents:

LOIs and full proposals that are submitted without the information listed in their respective requirements **will not be reviewed, and therefore will be disqualified from being considered for this program.**

VII. ULRI Proposal Processing and Review Procedures

UL Research Institutes is committed to cultivating diversity in people and perspectives, and maintains this sentiment with all processing and reviews throughout the grantee selection. To ensure inclusivity of our grant-making program, ULRI has selected dedicated teams for the review processes that support and embody the mission to foster a diverse and collaborative culture.

Applications will be evaluated for scientific merit by the selected review team. Each team will follow a scientific review process, and each application will receive a written critique that will be shared with the submitting organization upon progression into the selection process.

The following will be considered during the review process:

- Scientific and technical merit of the proposed project as determined by scientific review
- Relevance of proposed project to the scientific scope and focus areas provided by the institute or office
- Proposed use of funds

The committee will evaluate all applications thoroughly. Resubmissions are not permitted, however revisions are allowed once a proposal is accepted for award.

VIII. Award Administration Information

A. Notification of the Award

Notification of the award is made to the organization by a ULRI Office of Partnerships member. Organizations that have not been invited to submit full proposals will be notified as soon as possible. Copies of reviews will be provided to all applicants through ProposalCentral upon selection of grantees. This information will be sent to the Principal Investigator of the submitting organization.

B. Award Conditions

Upon being accepted as a grantee for the Discoveries in Safety Grants Program the chosen organizations will be provided with the following documents:

- The award notice with any amendments made to the submitted proposal
- The budget and the amounts ULRI bases its support
- Information regarding approvals/ disapprovals of the submitted budget
- Terms and conditions to be upheld during the award duration

The following is an overview of the terms and conditions that govern this research agreement. The complete award terms and conditions exhibit can be found in the supporting documentation for this Notice.

- List of program or budget-related changes that require ULRI's prior written approval
- Reporting and project results requirements
- Sharing of confidential or proprietary information
- Publication and attribution of results
- Intellectual property rights and commercialization

C. Reporting Requirements

Progress reports – submitted quarterly to ULRI using ProposalCentral. This report, submitted by the PI of the award, should include quarterly products, publications, inventions, and patents updates.

Invoices – submitted quarterly for reimbursement using ProposalCentral. All payments and invoices submitted throughout the duration of the project should be provided in USD.

Final Project Report – at the conclusion of the project, ULRI requires the submission of a final project report that includes a summary of project findings, outcomes, and data.

Failure to submit any of these documents by the due dates stipulated by ULRI in ProposalCentral will be subject to escalation, including the temporary pause of payments, at the discretion of ULRI.

IX. Contacts

All inquiries regarding this program should be directed to the Office of Partnerships at partnerships@ul.org with the subject line “ESRI Discoveries in Safety Grants Inquiry”. Informal communications included but not limited to requests for information, to any ULRI employee other than an Office of Partnerships representative is discouraged and may result in disqualification of an applicant’s proposal.

All program questions submitted during the questions period will be answered during the optional informational webinar (indicated in Key Dates). A recording of the webinar will be posted on the [program webpage](#) following the call.

Questions submitted outside the designated questions period (as indicated in the Key Dates) may be answered at the discretion of ULRI.

For technical questions related to ProposalCentral, please contact the ProposalCentral Customer Support Team: pcsupport@altum.com or (800) 875-2562.