Alfred P. Sloan
FOUNDATION

CALL FOR LETTERS OF INQUIRY:
SENSOR TECHNOLOGIES TO MONITOR
ENERGY OR ENVIRONMENTAL SYSTEMS
Grants between $1-1.5 million for collaborative science and engineering research projects led by early- and mid-career scholars to use sensor technologies to study energy or environmental systems in the United States

Submission Deadline: April 1, 2019

I. Overview

The Alfred P. Sloan Foundation has established a new, dedicated component within its Energy and Environment program focused on supporting energy and environmental science. ***The Foundation is currently soliciting Letters of Inquiry for innovative, collaborative academic research projects led by early- and mid-career scholars that use sensor technologies to monitor and analyze energy or environmental systems at a granular level in the United States.*** This is one of two open Calls for Letters of Inquiry announced by the Foundation's Energy and Environment program., with the other Call focused on researching net-zero interventions and negative emissions technologies, available at sloan.org/NETZERO-LOI.

A small number of full proposals will be invited from submissions responding to this Call. Award amounts are expected to range from $1-1.5 million over a 3-year period.

Opportunities for ongoing, cost-effective, and fine-grained monitoring of energy or environmental systems are being facilitated by a range of novel developments. These include widespread deployment of *in situ* or mobile sensors, improvements in remote sensing instrumentation, ability to integrate new data sources across scales, and the application of sophisticated data analysis techniques. Researchers are increasingly able to collect and integrate data from these multiple sources and across multiple scales to track and record environmental change in a variety of settings and measure the environmental impacts of energy systems. It is increasingly possible to use new sensor technologies to study defined localities—be they specific regions, cities, or ecosystem types—in great detail and across various temporal and spatial dimensions. These detailed measurements and analyses of environmental change, pollution, and greenhouse gas emissions are critical to providing stakeholders in government, industry, and non-governmental organizations with information needed to make decisions related to climate adaptation and mitigation and to improve the management of energy or environmental systems.

The Sloan Foundation's Energy and Environment program is interested in motivating new research that deploys sensors in novel ways to measure dynamic features of environmental or energy systems and that analyze this data to better understand how these systems vary over time. Proposed research projects should demonstrate the following characteristics:

- Cutting-edge, multidisciplinary research with potential for significant advancements in knowledge related to granular monitoring of energy or environmental systems;
- Original data collection and analysis, or the combination of existing sensor-generated datasets in innovative, impactful ways.
- Leadership by early- and mid-career faculty at the Assistant or Associate Professor levels.
- Collaboration between scholars from multiple fields of science and engineering, either within or across universities. Relevant disciplines include but are not limited to: environmental science, ecology, atmospheric science, civil and environmental engineering, geography, computer science, data science, and energy systems modeling, among others.
- Training of students (graduate students, postdoctoral researchers, or undergraduates) in disciplines related to the detailed monitoring of energy or environmental systems.
- Engagement with a range of stakeholders to help inform decision-making, including those in government, industry, and non-governmental organizations.
- Ability to leverage financial support or in-kind contributions from other sources.

II.   Research Questions

Example research questions for examination include but are not limited to:
- How can detailed, localized data from different sensors or measurement devices be combined to improve understanding of various dimensions of energy or environmental systems?
- What signatures of environmental impact can be identified by studying specific energy systems in greater depth?
- How can sensor technologies of different types provide insights about how energy or environmental systems are changing? To what extent can real-time monitoring of energy and environmental systems can be achieved?
- What are required temporal and spatial sensitivity thresholds for sensor technologies to function appropriately? To what extent can carbon dioxide, greenhouse gases, or other pollutants be measured with adequate specificity?
- What can be learned about energy or environmental systems by collecting and analyzing information on multiple pollutants and greenhouse gas emissions simultaneously?
- What novel devices or other instrumentation need to be developed to accelerate research that improves the measurement and monitoring of energy or environmental systems?

III.   Eligibility and Submission Deadline

Lead investigators of proposed projects must be Assistant or Associate Professors at U.S. universities or colleges. The Foundation strongly encourages submissions from diverse teams led by women or underrepresented minorities. Researchers may participate on more than one proposed project. Senior faculty and non-U.S.-based researchers may participate in proposed projects and are eligible to receive funding as research team members, advisors, or collaborators.

Submissions are due no later than Monday, April 1, 2019 at 5:00pm EDT. Submission materials must be integrated in a single PDF document and sent by email to energy@sloan.org, with subject heading and document title: SENSOR LOI – <Lead Researcher Name>.

IV. Submission Components
Submissions must include the following 3 components:

(1) A completed 1-page Sloan Foundation Proposal Cover Sheet, summarizing key research project details. Projects should have a proposed start date of January 1, 2020. The Proposal Cover Sheet is available at: https://sloan.org/grants/apply#tab-grant-forms

(2) A Letter of Inquiry 4-5 pages in length (excluding budget table and other material), **written in 12-point font.** Submissions should answer the following questions, with each question serving as a section heading:
1. What is the core research question and why is it important?[1]
2. What are the current knowledge gaps on this question?
3. What is the proposed research methodology?
4. What will be the outputs from the research project and how will they be disseminated?
5. What are the proposer and team qualifications?
6. What other sources of support can the project leverage?

(3) Supplemental material following the Letter of Inquiry, including:
1. A draft budget table for the proposed project. Funding requests are expected to range from between $1-1.5 million over a 3-year period, with sub-awards to collaborating partners indicated where appropriate. Allowable expenses will generally include:
   i. For faculty: up to one-month summer salary per investigator per year, plus benefits, capped at $25,000 per investigator per year, based on project time commitment
   ii. For graduate students, postdoctoral fellows, or undergraduate researchers: stipend and tuition reimbursement, plus benefits, based on project time commitment
   iii. Support for project-related administrative and research staff
   iv. Instrumentation, hardware, data acquisition, computational, and laboratory expenses
   v. Travel and research dissemination expenses
   vi. Indirect overhead expenses capped at 15% of direct costs
2. References or bibliography
3. Brief CV of key project leads and personnel (no more than 2 pages per person)
4. Letters of support from research partners, collaborators, or data providers, if available

V. Review Process
An expert review committee will assess submitted Letters of Inquiry. A small number of selected project submissions will be invited to prepare a full research proposal for consideration, likely to be submitted by early August 2019. Invited full proposals will be further reviewed. Proposers will receive feedback and asked to prepare a response to reviews, likely to be submitted by late September 2019. Final award decisions are expected will be made before the end of 2019. Some proposers may be invited to present proposed projects to the Foundation as one component of the review process.

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[1] Please note that projects focused on studying questions related to biodiversity are considered out of scope.