

Strategic Investments in Research

Innovation for sustainable and resilient infrastructure and communities

Introduction

Sustainability is a critical global challenge of our era. Achieving sustainability, while also promoting economic vitality and development will require innovation in technologies, policies and fundamental understanding of climate and related systems. Across this country and the world, the importance of creating sustainable systems is being recognized as necessary to preserve and enhance the conditions that allow humans to live and thrive. Working to prevent and reverse changes in the climate and environment will be a primary concern, but sustainability also will require ensuring that our natural and engineered systems are resilient to the changes that we cannot stop. That is, when preventing or reversing change is not possible, we need to ensure that the most critical elements of our world are robust in the face of changes in our environment.

Many areas of sustainability are being targeted for critical investment, research and innovation. For example, changes in climate, including increases in global temperature and changes in sea level, are having significant impact on communities and economies across the globe. Ensuring a sustainable climate will require assembling interdisciplinary groups to understand and address questions about the natural, engineered and human systems that affect or are affected by changes in climate. For example, we need to better understand the environment while also understanding the impact of large-scale human activities like manufacturing, construction, transportation and energy production on local and global populations. We also need to be focused on developing sustainable approaches to building, operating and supplying the infrastructure needed for our economy and communities. This will include new means of energy generation, storage and distribution, advanced approaches to manufacturing and construction, and policies that recognize and encourage the long term benefits of sustainable approaches.

As economies and populations grow, demands for energy, food and other goods increase. A growing and increasingly wealthy/consumptive world population places more demands on our energy and infrastructure systems. Efforts to meet these demands in an efficient manner often mean that these systems lack the level of redundancy that has historically been seen. Therefore these systems are less resilient to disruptions in our complex supply chains, energy networks, transportation systems and manufacturing facilities. These systems must be designed and built

not just to account for the expected usage, but they also must be resilient to unexpected events and changes.

Application and process

We seek proposals for interdisciplinary research and translation efforts that will address the challenges associated with making our communities and economy more sustainable, with particular focus on issues connected to energy, infrastructure and manufacturing. We expect these proposals to describe new research centers that involve groups of approximately 8-20 current faculty, describe key external partners and propose new research efforts that: 1) leverage current strengths; 2) propose new investments in faculty hires and research infrastructure; and 3) describe opportunities to partner with other organizations including universities, not-for-profits and for-profit companies.

Timeline:

Letter of Intent	Requested by 5:00 PM August 31, 2023
White paper	Due by 5:00 PM October 30, 2023

The Letter of Intent should include a descriptive title, list of team members (as currently known), and a 1-2 paragraph description of the central idea being proposed. Letters of Intent do not constitute an obligation to move forward; they are simply for planning purposes. White papers may be submitted even absent a Letter of Intent. Teams may be contacted by OVPR staff for consultation as they prepare white papers.

The three page white paper should consist of the following components:

- 1. Center summary (2 pages):** A description of the research focus of the proposed center.
 - a. What is the specific objective of the center? What problems are being targeted?
 - b. What are the current approaches/practices? And what are the limits/challenges of the current approach?
 - c. What is new in the proposed approach? Why do you think this approach will be successful?
 - d. What difference will it make if you succeed?

- 2. Description of Team (1 page):**
 - a. Who would be part of the day one team? (Include internal and external members.)

- b. What kinds of people would you seek to support the work?
- c. What partnerships would be key to develop?

Submit your application through Lehigh's [InfoReady](#) portal.

Review and criteria

Proposals will be initially reviewed by an internal group including the Provost, VPR, VP for Strategic Planning and Initiatives and the President. Proposals will be selected for further review and development based on the potential for these centers to result in signature high impact research activity by Lehigh faculty and students. Specifically we will assess:

1. Is an important area being targeted as the focus of research activities?
2. What is innovative about the proposed work?
3. Why is Lehigh well poised to lead in this area?
4. By combining existing strengths with new faculty hires, improvements to research infrastructure and new and existing partnerships, can Lehigh become one of the best places for this kind of work within the next decade?
5. Is activity in this area sustainable through external support (grants and gifts) and internal prioritization of resources like faculty lines, space etc.

If a team's proposal is selected for further review we will initiate an iterative process to refine and improve the proposal. Questions will include:

1. What are the risks? Why might you fail? How will you mitigate the risks?
2. What milestones (3-5 years) would you propose for the center? What specific objectives will be achieved?
3. What hires, infrastructure and other resources are needed to make this successful?

Assessment of these proposals will at various stages involve consultation with technical experts from outside of Lehigh.