

THE OFFICE OF THE VICE PRESIDENT FOR RESEARCH

THE PRESIDENTIAL INTERDISCIPLINARY RESEARCH INITIATIVE (PIRI)

1. Introduction and Goals

As a land-grant institution, Iowa State University's research mission advances the economy of Iowa and serves its citizens; addresses grand challenges by advancing knowledge, technology, and human potential; and educates students through creative scholarship and new discoveries.

As stated in the ISU strategic plan, Iowa State aspires to increase the impact made by its faculty, staff, and student researchers by proactively supporting the formation of new and existing, large-scale, interdisciplinary, multi-organizational research programs that pursue high-impact research to address grand challenges of the 21st century. The university seeks to significantly increase its level of sponsored research, and success in securing major grants and contracts is key to achieving that goal.

The **Presidential Interdisciplinary Research Initiative (PIRI)** was established to support this mission by proactively investing in initiatives that promote a culture of interdisciplinary research, help secure new largescale research grants and contracts, and build the university's reputation for innovation. To date, the initiative has significantly enhanced the research enterprise by establishing new large-scale research collaborations across campus and with other universities, federal agencies, and industry partners.

The Office of the President's expectation is that multi-year funding will lead directly to the formation of new interdisciplinary research programs that have a transformational impact at the university, and across the state and nation. Teams of researchers will be supported to prepare and submit proposals, compete successfully, and bring to campus multiple large-scale and flagship research programs in strategic areas of scholarship and expertise. Teams will be granted funding over a three-year period, contingent on a mid-course review.

2. Expectations

- Each team will have a lead faculty investigator and a core group of 5-10 faculty and staff members working together in the interdisciplinary area of recognized state and national importance to address grand challenges faced by society.
- Proposals from teams of investigators are expected because the full expertise required to address grand challenges crosses multiple disciplines and institutions.
- Teams are required to meaningfully integrate at least one faculty investigator to address ethical, legal, societal, environmental, and/or economic impacts (ELSEEI component).
- The lead investigator should be a full or associate professor at Iowa State, and the team should include participants from multiple academic units and colleges on campus.
- The initiative will foster collaboration and partnership by providing the teams with funding to successfully compete for new significant extramural research funding. As such, each team will submit multiple large-scale, multi-investigator, multi-organizational grants to various funding agencies, with commitments from business and industry, over the funding term of this initiative. In time, it is

expected that the resulting new research grants and contracts to Iowa State will far exceed the amount invested in PIRI funding for the project.

- The research areas should be core to Iowa State and address grand challenge research questions of a scope and complexity requiring the advantages of collaboration.
- The area of scholarship should likely be such that more than one agency may support the work.
- Teams are encouraged to pursue high-impact problems that require a “Convergence” style approach. NSF defines Convergence research as “solving vexing research problems, in particular, complex problems focusing on societal needs. It entails integrating knowledge, methods, and expertise from different disciplines and forming novel frameworks to catalyze scientific discovery and innovation.” Convergence research transcends interdisciplinary, multidisciplinary and transdisciplinary research. NSF style [Convergence Research](#) has two primary characteristics:
 - *Research driven by a specific and compelling problem.* Convergence Research is generally inspired by the need to address a specific challenge or opportunity, whether it arises from deep scientific questions or pressing societal needs.
 - *Deep integration across disciplines.* As experts from different disciplines pursue common research challenges, their knowledge, theories, methods, data, research communities and languages become increasingly intermingled or integrated. New frameworks, paradigms or even disciplines can form sustained interactions across multiple communities.

3. Iowa State University Grand Research Challenges - Overview

To support the strategic goal of growing the scale and impact of ISU research, the Office of the VPR and colleges have identified a set of grand challenge research themes that represent:

- Complex challenges connected to global problems, and potentially related to state and local concerns;
- Emerging next-generation areas of research that connect to ISU strengths;
- Excellent opportunities for expanding sponsored funding and advancing key research metrics;
- Strong integration across institutional missions (research, education, engagement) and a commitment to promoting and evaluating societal impacts; and
- A clear case for faculty involvement from multiple colleges.

Using these criteria, the following strongly interconnected *ISU Grand Challenges Research Themes* have evolved:

1. Enabling Healthy Lives

The healthy lives research theme seeks to position Iowa State as one of the best universities in the world that provides transformative science-based solutions to pursuing a healthy lifestyle by recognizing the interdependencies of human, animal, and plant health, in an environment persistently confronted with water issues, diseases both old and new, and an aging population.

2. Building Sustainable Human and Natural Ecosystems

Echoed in many agencies, the sustainability theme addresses the challenge of balancing current societal needs with the well-being of future generations by developing the scientific and societal

underpinnings of sustainability in its broadest sense – from deciphering the food-energy-water nexus to creating vibrant and engaged communities with supportive cultural, social, economic, and environmental conditions.

3. *Creating Next-Generation Materials and Manufacturing Technologies*

As one of the top priorities of the White House Office of Science and Technology Policy, the advanced materials and manufacturing research theme speaks to Iowa State's excellent foundations to create new materials and transformative manufacturing technologies by leveraging shared infrastructure facilities between federal and university laboratories and building strong public-private partnerships.

4. *Data-Driven Discovery and Information Systems for Societal Challenges*

The data and information systems research theme leverages Iowa State's strengths with increasingly powerful and interconnected data-driven systems to improve the lives and security of citizens, communities, and organizations through new approaches to harnessing complex and dynamic data sources arising from nearly any context – from science and engineering, to business and policymaking, to creative and humanistic endeavors.

5. *Enabling Citizens and the Workforce*

To fulfill Iowa State's vision of building the capacity to address grand challenges, the education and workforce research theme focuses on investigating the most effective ways of preparing our next generation of leaders, problem-solvers and lifelong learners through education and engagement that transforms and enriches not only pre-K, K-12, community college, and university classrooms, but also their communities.

4. Financials

PIRI funding is planned to be allocated at an annual level of \$125,000 – \$250,000 per team over a 3-year period, with funds to be partially supported by cost sharing with colleges. It is expected that up to three teams will receive funding at this level starting in calendar year 2018.

Appropriate uses of PIRI funding include academic year teaching release, hiring of graduate students and postdocs, travel, hiring of consultants to add value to the team, and development of strong, meaningful, and lasting connections with partner institutions, funding agencies, and industry through workshops. Equipment can be funded in exceptional situations. Funds may not be used to support summer salaries.

5. Applications

Proposals for PIRI funds will be submitted to the Office of the Vice President for Research (VPR) through a two-step process that involves an initial white paper and a full proposal by invitation only.

The portion of the white paper that describes the proposal is limited to three single-sided pages, with one-inch margins on all sides, and typed in 11-point (or greater) Calibri or Times New Roman font. Each white paper should include the following:

- A title page that lists the proposal title and the senior participating investigators along with their organizational or departmental affiliation.
- A white paper of up to three pages that articulates the proposed vision and activities of the team:
 - Rationale and vision for the proposed research, describing the scale of your effort, and highlighting its innovative and transformational nature.

- A concise description of the long-term research goals, which highlights the need for an interdisciplinary approach involving multiple investigators, and the means for achieving success.
- Meaningful descriptions of how ELSEEI research is an integrated component of the vision and project (or justification for why ELSEEI is not an important component of the project).
- An outline of the planned research.
- The role of each team member and a brief description of interactions as a team as opposed to individual functions.
- Plans for intellectual exchange with partner researchers and institutions, industry, national laboratories, and/or other organizations.
- List of funding agencies and programs, companies, and others that will be targeted for external funding proposals.
- Additional materials beyond title page and white paper:
 - One-page budget - [Budget template here](#).
 - One-page budget justification, including documentation from the college(s) acknowledging the project.
 - Two-page, NSF-style CVs for each investigator listed on the title page. For details on the format of NSF-style CVs please see the NSF Grant Proposal Guide, Chapter II, Section C.2.f available at https://www.nsf.gov/pubs/policydocs/pappg17_1/pappg_2.jsp#IIC2f.

6. Review Criteria

The criteria used to select white papers for full proposal invitations include the following:

- Demonstrated ability to articulate a well-integrated, interdisciplinary research program or center of excellence driven by a vision that could lead to major advances, discoveries, and technologies.
- Strength and clarity of the plan to form a strong and sustained research team, and to secure extramural funding.
- Alignment of the proposed research program with the declared grand research challenges of Iowa State University (see Section 3 above).
- Presentation of the benefits of a multi-investigator, interdisciplinary approach.
- Value added to the university.
- Meaningful integration of ELSEEI dimensions of proposed research activities.
- Qualifications, accomplishments, and collaborative track record of the team.

7. Reporting Requirements

An annual report is due to the Vice President for Research 30 days before the next funding period starts and a final report is due within 60 days of the end of the approved award period. Reports should outline progress toward stated goals and list products generated from the project. Final report should describe research outcomes and future plans as well as plans for sustaining collaborations and research. A reporting template will be provided to award recipients.

Reports should be submitted as a single PDF with the PI name in the title via email to vprfunding@iastate.edu.

8. Application Process

The timeline for the application process is as follows:

- **January 15** - White papers due - must be electronically submitted as a single PDF attachment by 5:00 p.m. via the web form link: [Submit White Paper Here](#)

- **February 1** - Invitation for full proposals distributed.
- **March 18** - Invited full proposals due - must be electronically submitted as a single PDF attachment by 5:00 p.m. via the web form link:
[Submit Full Proposals Here](#)

The selection process will be led by the Office of the Vice President for Research, with representatives from all colleges. Subject matter experts drawn from academia, government laboratories, and industry will also review the full proposals and assist the committee in the selection process.

Announcement of awards will be made on or around May 15. Funding will start August 15.

If you have any questions about this program, please contact vprfunding@iastate.edu, or Jim Reecy, Office of the Vice President for Research, jreecy@iastate.edu.