Developing Grant Proposals

Purdue grant writing strategies and assistance

Sally Bond

Assistant Director of Research Development Services

Proposal Coordination

Office of the Vice President for Research and Partnerships

PURDUE UNIVERSITY

Purdue Research Development

Office for the Vice President for Research and Partnerships

Grant Writing Services

Help available for both large and small proposals

PURDUE UNIVERSITY® | Office of the Executive Vice President for Research and Partnerships

Home   About Us ▾   Research Compliance ▾   Funding and Grant Writing ▾   Partnerships   Centers, Institutes, Cores ▾   Publications and Data ▾   Staff

Home / Funding And Grant Writing / Grant Writing

Overview

Funding   ▸

Limited Submissions

Grant Writing Services

Grant Writing Resources

Site Visits

Events

FAQs

Where do I go for help with...

Cost Sharing

Research Bridge Program

Grant Writing Services

Large Proposal Development Services

EVPRP grant writers assist faculty in the development of high-value, high-complexity proposals that often represent a multi-departmental and inter-institutional collaboration. If you have questions or would like to request EVPRP-funded proposal coordinator services, please contact Sally Bond. Our grant writers assist with:

- proposal preparation timelines and processes

- a compelling "storyline" or gap analysis
- agency mission and requirements of specific grant competitions
- meeting logistics
- assessment, outreach, and diversity component needs
- writing of non-technical text and transitions
- document control and copyediting
- graphics support
- institutional support letters (see Self-Help Tools)
- addendum forms such as conflict of interest and biosketches

(For information about cost-sharing commitments, please visit our Cost Sharing page)

Small Proposal Development Services

EVPRP grant writers are also available to consult individually with faculty who are writing small grant proposals for *external* funding. We can help you with:

- agency solicitation requirements
- a proposal preparation timeline
- proposal organization
- guidance for graphics
- specific proposal sections such as storyline or specific aims

3

Grant Writing Resources

Templates, tools, boilerplate

Grant Writing Resources

Overview

Funding ▸

Limited Submissions

Grant Writing Services

Grant Writing Resources

Site Visits

Events

FAQs

Where do I go for help with...

Cost Sharing

Research Bridge Program

Quick Reference Guides

- **Proposal Prep 101** 📄
- **Where do I go for Help with...?**
- **A Guide to the Grants Process at Purdue University** 📄 This booklet, created by EVPRP Research Development staff, includes useful information regarding processes and resources related to funding and research grant administration at Purdue. A must read for new faculty.
- **Preparing to Meet with Your Program Manager** This guide provides tips for a successful visit with a program manager.

Purdue Drop-in Text

Find up-to-date "boilerplate" text for Purdue institutional resources and facilities at the **EVPRP e-Pubs** site for use, either in entirety or pertinent portions, in proposals submitted to funding agencies. Documents are searchable by keyword and include citations to avoid plagiarism.

Self-Help Tools for Proposal Preparation

This series provides step-wise guidance, samples, and/or tailorable text for some of the non-research-related requirements of a proposal submission. *Note: Only accessible from the purdue.edu domain.

- **Tool # 1: Management Plan Self-Assessment** 📄
- **Tool # 2: Annotated Letters of Individual or Institutional Commitment** 📄
- **Tool # 3: Postdoctoral Mentoring Plan Template** 📄
- **Tool # 4: Preparing Major or Shared Research Instrumentation Proposals** 📄

Broader Impacts Resources

All NSF proposals must include a section within the Project Description that discusses the broader impacts of the proposed activities. The resources below may be helpful in completing this requirement.

- **Virtual Rolodex of Potential Education and Outreach Partners** Proposal-focused information on campus resources you can leverage for broad impacts.
- **Steps to Leveraging Campus Resources for Broader Impacts** 📄 This figure walks you through best practices for incorporating broader impacts in your research proposal.
- **NSF Merit Review FAQs from January 2013** These FAQs help clarify recent policy changes for merit review of broader impacts.
- Center for Ocean Sciences Education Excellence's **_Broader Impacts 2.0_®** 📄 This excellent document from COSEE helps to clarify the broader impacts criterion and provides practical tips for addressing broader impacts in your proposal.

Grant Writing Resources

Proposal Prep 101

OFFICE OF THE EXECUTIVE VICE PRESIDENT FOR RESEARCH AND PARTNERSHIPS

Proposal Prep 101

- *Need assistance setting up your Pivot account to locate funding?*
  Contact Kristyn Jewell (kristynj@purdue.edu) for one-on-one help.

- *Interested in NIH funding opportunities?*
  Contact Perry Kirkham (pkirkham@purdue.edu) for NIH-specific guidance.

- *Ready to start budget and authorization?*
  Visit www.purdue.edu/business/sps/preaward.

- *Need a grant writer?*
  Contact Sally Bond (sbond@purdue.edu) for larger, multidisciplinary proposal services and proposalcoordinator@purdue.edu for consultations and assistance on single-investigator proposals.

- *Want an internal review of your proposal before submission?*
  Contact Sally Bond (sbond@ purdue.edu).

- *Looking for boilerplate text on Purdue resources?*
  Visit our e-Pubs site at http://docs.lib.purdue.edu/ovpr/.

- *Planning a site visit from your funding agency?*
  Contact Sue Grimes (sgrimes@purdue.edu) for logistical help.

ACCESS THE FUNDING AND GRANT WRITING WEBSITE
www.purdue.edu/research/funding-and-grant-writing/overview.php

...for key resources such as:

- Registration for workshops
- Self-help proposal development tools and data management plan templates
- Instructions and templates for Purdue limited submissions
- Rolodex of potential broader impact partners
- *Guide to the Grants Process at Purdue* booklet

Follow us on Twitter at @Research_Purdue.
Join the conversation with #PUgrantwriter.

PURDUE UNIVERSITY

4/3/2015

5

Tailored and intentional plan

General 10-week project timeline:

	1	2	3	4	5	6	7	8	9	10
Analysis and Planning										
Distribute documents noted in RFP	▓									
Identify previously successful proposals	▓									
Identify PI	▓									
Notify Pre-Award Center for assigned budget specialist	▓									
Problem Overview	▓	▓	▓							
• *What is the problem*										
• *What has already been done to address problem*										
• *What gaps remain*										
• *How we propose to address gaps*										
Vision			▓							
Goals			▓							
Identify proposal win themes/discriminators			▓							
Program Officer Input										
Contact PO	initial	▓								
Team debrief on meeting			▓							
Refine initial analysis/planning				▓						
Proposed Outline										
Discuss/refine outline structure				▓						
More detailed outline, if needed				▓						
Identify graphics needed			▓	▓						
Partnerships										
Recruit collaborative partners		▓	▓	▓						
Produce "talking points" brochure or website			▓	▓						
Recruit industry affiliates					▓	▓	▓	▓		
Recruit advisory board members						▓	▓	▓		
Collect letters of commitment						▓	▓	▓	▓	
Management and Personnel										
Identify basic management structure			▓	▓						
Collect biosketches				▓	▓	▓	▓	▓		
Proposal Writing and Editing										
Assign writing			▓							
Write section components				▓	▓					
Compile 1st draft						▓				
Project team 1st edit						▓				
Any outside review input/edit							▓			
Editing iterations								▓	▓	▓
Write summary or abstract										▓

Red Text: Important to have agreement (and explicit text for problem overview) prior to proposal writing

Key Strategies

Strategies for the strongest proposal submission

- tell a compelling story

- respond to solicitation

- answer "Why Purdue?"

- know your reviewer
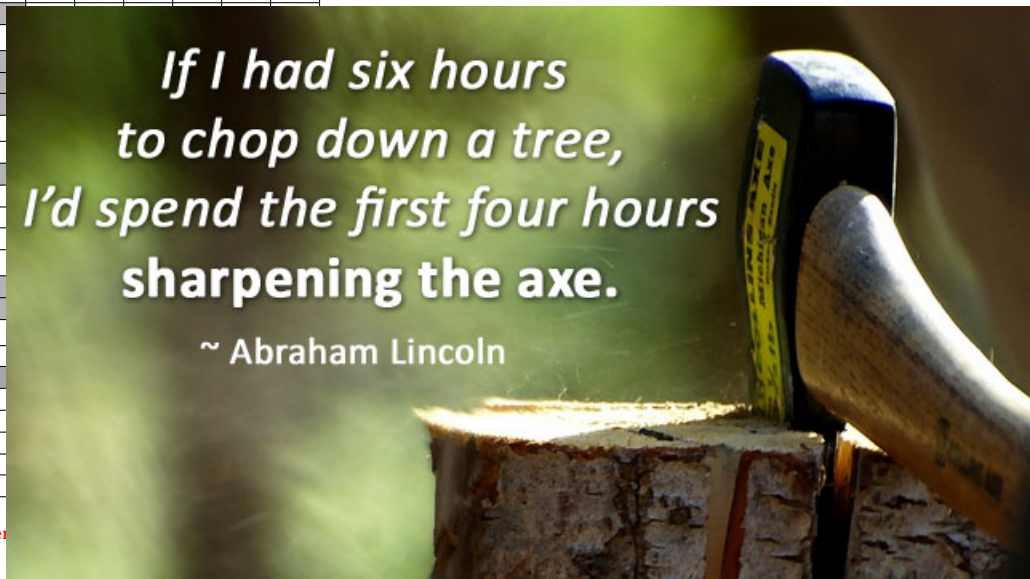
- conduct internal review

Build the Storyline

Storyline first!

General 10-week project timeline:

	1	2	3	4	5	6	7	8	9	10
Analysis and Planning										
Distribute documents noted in RFP										
Identify previously successful proposals										
Identify PI										
Notify Pre-Award Center for assigned specialist										
Problem Overview · What is the problem · What has already been done to address problem · What gaps remain · How we propose to address gaps										
Vision										
Goals										
Identify proposal win themes/discriminators										
Program Officer Input										
Contact PO	initial									
Team debrief on meeting										
Refine initial analysis/planning										
Proposed Outline										
Discuss/refine outline structure										
More detailed outline, if needed										
Identify graphics needed										
Partnerships										
Recruit collaborative partners										
Produce "talking points" brochure or website										
Recruit industry affiliates										
Recruit advisory board members										
Collect letters of commitment										
Management and Personnel										
Identify basic management structure										
Collect biosketches										
Proposal Writing and Editing										
Assign writing										
Write section components										
Compile 1st draft										
Project team 1st edit										
Any outside review input/edit										
Editing iterations										
Write summary or abstract										

Red Text: Important to have agreement (and explicit text for proble[m]...

If I had six hours to chop down a tree, I'd spend the first four hours sharpening the axe.

~ Abraham Lincoln

- tell a compelling story

- respond to solicitation

- answer

- know y

- conduc

Good science is a story that…
- begins with a problem
- provides coherence in narrative
- hooks reviewer so weaknesses are not fatal
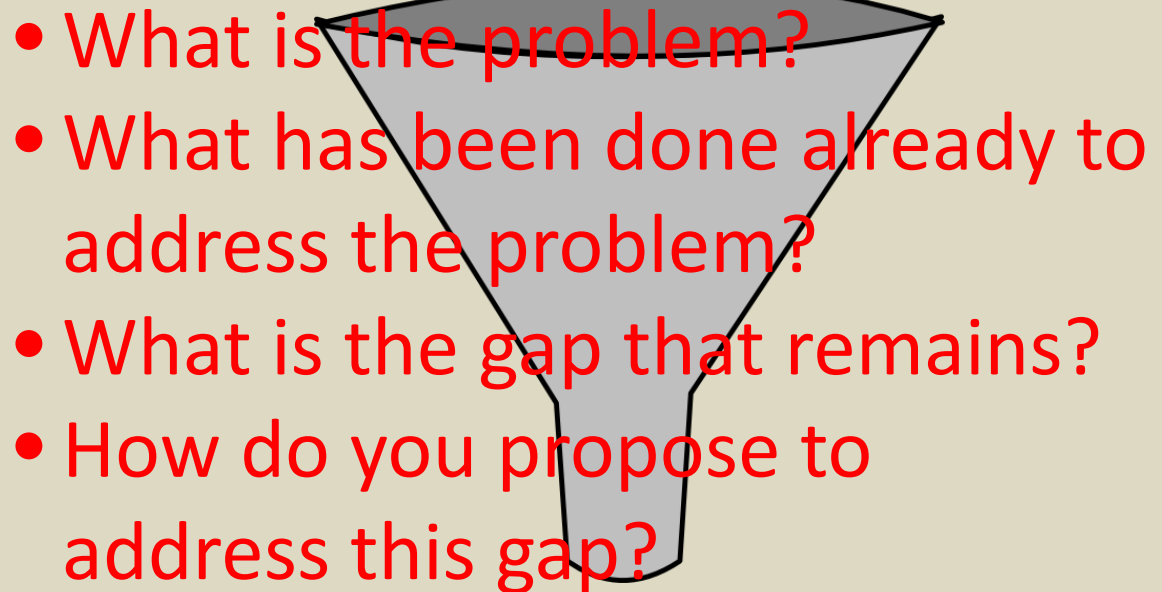- sets "north star"

Build the Storyline

- tell a compelling story

- respond to solicitation

- answe

- know

- condu

  - What is the problem?
  - What has been done already to address the problem?
  - What is the gap that remains?
  - How do you propose to address this gap?

Funnel of logic flow

- tell a compelling story

- respon~~d to solicitation~~

- answe~~r~~

- know ~~v~~

- condu~~c~~

  - What is the problem?
  - What has been done already to address the problem?
  - What is the gap that remains?
  - How do you propose to address this gap?

Build the Storyline

Carolina Wählby of the Broad Institute
http://www.niaid.nih.gov/researchfunding/grant/pages/appsamples.aspx

A   Significance

The NIH is committed to translating basic biomedical research into clinical practice and thereby impacting global human health[1], and Francis Collins identifies high-throughput technology as one of five areas of focus for the NIH's research agenda[2]. For many diseases, researchers have identified successful novel therapeutics or research probes by applying technical advances in automation to high-throughput screening (HTS) using either biochemical or cell-based assays[3–6]. Researchers are using genetic perturbations such as RNA interference or gene overexpression in cell-based HTS assays to identify genetic regulators of disease processes as potential drug targets[7–9]. However, the molecular mechanisms of many diseases that deeply impact human health worldwide are not well-understood and thus cannot yet be reduced to biochemical or cell-based assays.

Ideally, researchers could approach disease from a phenotypic direction, in addition to the traditional molecular approach, by searching for chemical or genetic regulators of disease processes in whole model organisms rather than isolated cells or proteins. Moving HTS towards more intact, physiological systems also improves the likelihood that the findings from such experiments accurately translate into the context of the human body (e.g., in terms of toxicity and bioavailability), simplifying the path to clinical trials and reducing the failure of potential therapeutics at later stages of testing. In fact, for some diseases, a whole organism screen may actually be necessary to break new therapeutic ground; in the search for novel therapeutics for infectious agents, for example, it is widely speculated that the traditional approach of screening for chemicals that directly kill bacteria *in vitro* has been largely exhausted[10]. Our work recently identified six novel classes of chemicals that cure model organisms from infection by the important human pathogen *E. faecalis* through mechanisms distinct from directly killing the bacterium itself[11]. Anti-infectives with new mechanisms of action are urgently needed to combat widespread antibiotic resistance in pathogens.

Enabling HTS in whole organisms is therefore recognized as a high priority (NIH PAR-08-024)[12,13]. *C. elegans* is a natural choice. Manually-analyzed RNAi and chemical screens are well-proven in this organism, with dozens completed[14–16]. Many existing assays can be adapted to HTS; instrumentation exists to handle and culture *C. elegans* in HTS-compatible multi-well. Its organ systems have high physiologic similarity and genetic conservation with humans[17,18]. *C. elegans* is particularly suited to assays involving visual phenotypes: physiologic abnormalities and fluorescent markers are easily observed because the worm is mostly transparent. The worms follow a stereotypic development pattern that yields identically-appearing adults[19,20], such that deviations from wild-type are more readily apparent.

The bottleneck that remains for tackling important human health problems using *C. elegans* HTS is image analysis (NIH PA-07-320)[21,22]. It has been recently stated, "Currently, one of the biggest technical limitations for large-scale RNAi-based screens in *C. elegans* is the lack of efficient high-throughput methods to quantitate lethality, growth rates, and other morphological phenotypes"[23]. **Our proposal to develop image analysis algorithms to identify regulators of infection and metabolism in high-throughput *C. elegans* assays would bring image-based HTS to whole organisms, and have the following impact:**

Build the Storyline

One-page project description sent to program officer that includes:

- concise storyline

- vision/goals

- team

- methodology/approach

- impact

Build the Storyline

One-page...taste of your entire grant in a single, bite-sized piece

It forces you to distill all aspects down to their essences and to find a way of piecing things together that is economical, coherent, logical, and compelling [...] is totally unforgiving, revealing problems in the clarity of your thinking and presentation, weaknesses in the logic of your research, vagueness in your methods, and failures in the all-important 'so what?' realm. Given the luxury of length, additional verbiage has a way of camouflaging weaknesses (at least from the writer but not so often from the reviewer).

—Robert Levenson, UC-Berkeley

Key Strategies

- tell a compelling story

- respond to solicitation

- answer "W

- know you

  - follow all instructions!
  - outline before writing

- conduct internal review

Respond to Solicitation

Follow all instructions! Know the agency guidelines as well as solicitation
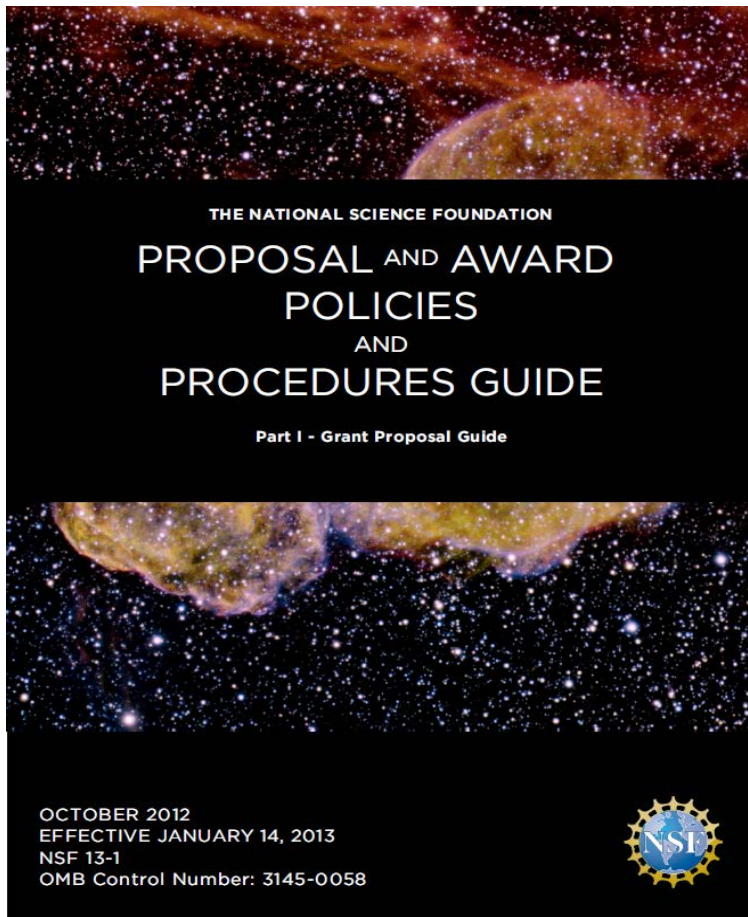
Research on Education and Learning (REAL)

PROGRAM SOLICITATION
NSF 13-604

REPLACES DOCUMENT(S):
NSF 10-516, NSF 12-542, NSF 12-552

National Science Foundation
Directorate for Education & Human Resources
Research on Learning in Formal and Informal Settings

Letter of Intent Due Date(s) *(optional)* (due by 5 p.m. proposer's local time):

October 25, 2013

Full Proposal Deadline(s) (due by 5 p.m. proposer's local time):

January 10, 2014

IMPORTANT INFORMATION AND REVISION NOTES

A revised version of the *NSF Proposal & Award Policies & Procedures Guide* (PAPPG), NSF 13-1, was issued on October 4, 2012 and is effective for proposals submitted, or due, on or after January 14, 2013. Please be advised that the guidelines contained in NSF 13-1 apply to proposals submitted in response to this funding opportunity.

Please be aware that significant changes have been made to the PAPPG to implement revised merit review criteria based on the National Science Board (NSB) report, National Science Foundation's Merit Review Criteria: Review and Revisions. While the two merit review criteria remain unchanged (Intellectual Merit and Broader Impacts), guidance has been provided to clarify and improve the function of the criteria. Changes will affect the project summary and project description sections of proposals. Annual and final reports also will be affected.

A by-chapter summary of this and other significant changes is provided at the beginning of both the *Grant Proposal Guide* and the *Award & Administration Guide*.

Please note that this program solicitation may contain supplemental proposal preparation guidance and/or guidance that deviates from the guidelines established in the *Grant Proposal Guide*.

Revision Summary

This solicitation has been revised to incorporate into the Other Information section a newly issued publication jointly developed by the National Science Foundation and the Institute of Education Sciences in the U.S. Department of Education entitled, *Common Guidelines for Education Research and Development*. The *Guidelines* describe six types of research studies that can generate evidence about how to increase student learning. Research types include those that generate the most fundamental understandings related to education and learning; examinations of associations between variables; iterative design and testing of strategies or interventions; and assessments of the impact of a fully-developed intervention on an education outcome. For each research type, there is a description of the purpose and the expected empirical and/or theoretical justifications, types of project outcomes, and quality of evidence.

The *Guidelines* publication can be found on the NSF website with the number NSF 13-126 (http://www.nsf.gov/pubs/2013/nsf13126/nsf13126.pdf). A set of FAQs regarding the *Guidelines* are

Respond to Solicitation

Sleuth what was funded previously to identify trends

- What type of science and how does it compare to yours?

- What was team composition?

- What type of education integration?

- What type of institution?

- What type of budget?

Respond to Solicitation

Agency websites often show what was previously funded.

www.nsf.gov

Respond to Solicitation

Each program page has "what has been funded" and map of recent awards.

Respond to Solicitation

NIH RePORTer http://projectreporter.nih.gov/reporter.cfm.

Respond to Solicitation

NIH RePORTer http://projectreporter.nih.gov/reporter.cfm.

Respond to Solicitation

Outline before you write. Be consistent with formatting.

Example of NSF-style proposal outline

1. RATIONALE [2.5 pages]
- Storyline
  - What is the problem?
  - What has been done already?
  - What is the gap that still remains?
  - What do you propose to do to address this gap?

Goals and Objectives
- List goals and objectives (per goal)

Team Partnership
- Team expertise
- Targeted teacher and/or community college faculty participants
- Institutional commitment

Broader Impacts
- curriculum accessed by underrepresented students through targeted teacher recruitment
- community-based research activities
- integrating research activities into computing-related courses in local high schools
- role models from HCBU partner on HUBzero webinars
- presentation to parent-teacher organizations to include assessment results from DLRC-collected metrics
- presentations at both technology education conferences as well as K-12 STEM learning

2. NATURE OF TEACHER ACTIVITIES [3.5 pages]
- Need clearly articulated research projects and activities
  - Map to goals/objectives
- Teachers must be involved in research project for at least 6 weeks
- Must have orientation session at beginning of the program for the teachers to acquaint them with laboratory methods, safety procedures, analytical methods, etc
- Address approach to research training being undertaken

Research Project
- Include overview statement of spectrum of research projects

Project 1
- Provide detailed descriptions of examples of research projects
  - Include who is doing what role
- Present plans that will ensure the development of RET participant-faculty interaction and communication
- How will you facilitate development of collegial relationships and interactions as teachers work closely in teams with university faculty and students?

Project 2
- Provide detailed descriptions of examples of research projects
  - Include who is doing what role
- Present plans that will ensure the development of RET participant-faculty interaction and communication
- How will you facilitate development of collegial relationships and interactions as teachers work closely in teams with university faculty and students?

Project Timetable
- Need Gantt-style chart such as this.
- Overview sentence

Program Initiatives	Year one	Year Two	Year Three	Year Four	Year Five
CICAWEST Administration					
Advisory Board Meeting					
D&I Team and COD meeting					
Mentoring Academy					
Training of coaches/chairs					
Mentoring pairs					
Departmental Transformation					
Diversity Forums					
Chairs/Dept Heads @ PU					
All Three Institutions					
Transformational Team Visits					
NCWIT Visiting Committees					
Promotion and Tenure Review					
Building Networks					
Summit					
Invited Lectures					
Evaluation and Assessment					
STEM Climate Assessment					
Space/Resource Inventory					
Coaching Measures					
Mentor/Mentee percp/self-eff/prod					
Attitudinal Surveys					
Deans and Heads					
Faculty					
Network Analysis					
External Project Analysis					
Dissemination					
Website					
CIC Women in Academia					
Summit Attendees Mailings					
Publications					
National Presentations					

3. RESEARCH ENVIRONMENT [2.5 pages]
- Describe the experience and record of involvement with K-12/community college education and research of the PI
- Describe faculty who may serve as research mentors. Consider table such as:

Mentor Name	Dept/School	Expertise

- Describe institution
  - Include emphasis on cross-disciplinary partnership and past record of success in cross-disciplinary collaborations

22

Key Strategies

- tell a compelling story

- respond to solicitation

- answer "Why Purdue?"

- know yo

  - win differentiators of expertise, facilities, prior work, campus environment

- conduct

Key Strategies

- tell a compelli

- respond to soli

- answer "Why F

- **know your reviewer**

- conduct internal review

- writing for expert and non-expert
- busy, rushed
- did not choose to read your proposal

Know Your Reviewer

Be kind...you are not writing for yourself.

- use formatting as a roadmap

- be generous with white space

- fix grammar and proof proposal

- get rid of passive voice whenever possible

Know Your Reviewer

Parallel formatting provides a roadmap to help your reviewer

Example of NSF-style proposal outline

1. RATIONALE **[2.5 pages]**
   - Storyline
     - What is the problem?
     - What has been done already?
     - What is the gap that still remains?
     - What do you propose to do to address this gap?

Goals and Objectives
   - List goals and objectives (per goal)

Team Partnership
   - Team expertise
   - Targeted teacher and/or community college faculty participants
   - Institutional commitment

Broader Impacts
   - curriculum accessed by underrepresented students through targeted teacher recruitment
   - community-based research activities
   - integrating research activities into computing-related courses in local high schools
   - role models from HCBU partner on HUBzero webinars
   - presentation to parent-teacher organizations to include assessment results from DLRC-collected metrics
   - presentations at both technology education conferences as well as K-12 STEM learning

2. NATURE OF TEACHER ACTIVITIES **[3.5 pages]**
   - Need clearly articulated research projects and activities
     - Map to goals/objectives
   - Teachers must be involved in research project for at least 6 weeks
   - Must have orientation session at beginning of the program for the teachers to acquaint them with laboratory methods, safety procedures, analytical methods, etc
   - Address approach to research training being undertaken

Research Project
   - Include overview statement of spectrum of research projects

Project 1
   - Provide detailed descriptions of examples of research projects
     - Include who is doing what role
   - Present plans that will ensure the development of RET participant-faculty interaction and communication
   - How will you facilitate development of collegial relationships and interactions as teachers work closely in teams with university faculty and students?

Project 2
   - Provide detailed descriptions of examples of research projects
     - Include who is doing what role
   - Present plans that will ensure the development of RET participant-faculty interaction and communication
   - How will you facilitate development of collegial relationships and interactions as teachers work closely in teams with university faculty and students?

Project Timetable
   - Need Gantt-style chart such as this.
   - Overview sentence

Program Initiatives	Year one	Year Two	Year Three	Year Four	Year Five
CICAWEST Administration					
Advisory Board Meeting					
D&I Team and COD meeting					
Mentoring Academy					
Training of coaches/chairs					
Mentoring pairs					
Departmental Transformation					
Diversity Forums					
Chairs/Dept Heads @ PU					
All Three Institutions					
Transformational Team Visits					
NCWIT Visiting Committees					
Promotion and Tenure Review					
Building Networks					
Summit					
Invited Lectures					
Evaluation and Assessment					
STEM Climate Assessment					
Space/Resource Inventory					
Coaching Measures					
Mentor/Mentee percp/self-eff/prod					
Attitudinal Surveys					
Deans and Heads					
Faculty					
Network Analysis					
External Project Analysis					
Dissemination					
Website					
CIC *Women in Academia*					
Summit Attendees Mailings					
Publications					
National Presentations					

3. RESEARCH ENVIRONMENT **[2.5 pages]**
   - Describe the experience and record of involvement with K-12/community college education and research of the PI
   - Describe faculty who may serve as research mentors. Consider table such as:

Mentor Name	Dept/School	Expertise

   - Describe institution
     - Include emphasis on cross-disciplinary partnership and past record of success in cross-disciplinary collaborations

26

Know Your Reviewer

Parallel formatting provides a roadmap to help your reviewer

Research Strategy (usually 12 pages) Option 2 with common preliminary studies

A. **Significance**
B. **Innovation**
C. **Approach**
- Overview sentence on the team and the approach

Preliminary Studies (for all the aims together)
- For all the aims together

Title of Specific Aim #1 (verbatim from your specific aims section)
  - o Introductory paragraph

  Research Design

  Expected Outcomes

  Potential Problems and Alternative Strategies

Title of Specific Aim #2 (verbatim from your specific aims section)
  - o Introductory paragraph

  Research Design

  Expected Outcomes

  Potential Problems and Alternative Strategies

Title of Specific Aim #3 (verbatim from your specific aims section)
  - o Introductory paragraph

  Research Design

  Expected Outcomes

  Potential Problems and Alternative Strategies

Timetable
- Use Gantt chart

Future Directions (optional)

Know Your Reviewer

Avoid dense text by adding white space

Format 1

The NEES collaboration created a total of 15 advanced equipment sites for experimental work dedicated to the reduction of the earthquake threat (Figure 4). The current experimental reach of the equipment ranges from the marine to the geotechnical to the structural environments and can address almost any technical question that may arise on issues related to the safety of the built-environment in earthquakes. Development of this massive array of experimental capabilities demanded an intense and sustained effort. In retrospect, it would appear that the leaders of research groups involved in the creation of the 15 sites were totally absorbed, as they should have been, in the proper development of a magnificent experimental capability across the U.S. Unfortunately, there were three unplanned and unintended results: 1) a negative perception among a portion of the research community that equipment access was not equitable; 2) most, if not all, of the research work initiated has not yet been of a quality to transform the engineering community culture; and 3) the information technology infrastructure, which had initially inspired the NEES concept of a network of interconnected laboratories, has yet to reach its potential. The metaphor of a powerful fleet of battleships at anchor is not irrelevant to the current status. Our goal is to get the fleet moving in harmony.

Rapid advance in engineering knowledge and capability requires at least four ingredients: 1) a driving need; 2) a large community of well-educated professionals; 3) financial support; and 4) competing centers of research and development. As emphasized by the tragic disaster in Wenchuan, PRC, in May 2008, there continues to be a critical need for advances in earthquake-loss reduction. Considering the seismic histories of population centers such as San Francisco, Los Angeles, Katmandu, and Istanbul, there is no basis for expecting the earthquake threat to abate in the foreseeable future. In large measure because of the encouragement of the National Science Foundation since the early 1970's, the U.S. is blessed with an impressively large community of professionals well trained in earthquake engineering and related sciences. The first two ingredients are very much in place. As long as the U.S. continues to have a strong economic profile and maintains its proven ability to plan beyond the immediate future, financial support for research and development in earthquake issues will continue. Our mission, then, is for NEES to take the lead in providing the competing centers of research and development to achieve catalysis of the existing essential ingredients as described below. The seminal idea for the NEES network was the creation of an experimental-research infrastructure with many visions and capabilities at different research centers connected with a single purpose through the opportunity provided by information technology. The objective of creating a successful equipment infrastructure has been achieved. A driving challenge now is to resuscitate what was intended to be the cortex of the system: the information technology (IT) that can enable the required catalysis of ideas.

Our overall strategy is designed to: 1) inspire the NEES researcher to pursue a more ambitious research agenda; 2) entice the rest of the research community to compete for the opportunity to benefit from the sites; 3) encourage academic researchers to interact with the professional engineers in order to accelerate the implementation of new knowledge in practice; and 4) develop a NEES *community* that will include all individuals, institutes, agencies, corporations, professional societies, and non-governmental organizations (NGO) interested in protecting society from the harmful consequences of earthquakes.

A brief look at the history of civilizations will reveal that the nuclear ingredient in their development has been the "agora," or the market. Using the opportunities provided by information technology, we plan to develop the intellectual equivalent of the agora in order to get the "fleet at anchor" moving at an ever-increasing pace. We will employ operational excellence, innovative computational tools, outreach that advances knowledge, and an environment for the catalysis of ideas. Among the qualitative and quantitative performance metrics for measuring our success and developing a compelling basis for continued operation are: 1) the *satisfaction* of users (including both physical and analytical researchers); NEEShub users; and education, outreach and training targets; 2) a *greater diversification* of users, research sponsors, operations sponsors, outreach community, and the NEEShub community; 3) *increased research productivity* in earthquake engineering, including the increased use of NEES equipment by remote users; 4) *greater impact* on codes, technical committees, professional societies, and research directions; and, eventually, 5) *reduced losses* from earthquakes.

Format 2

The NEES collaboration created a total of 15 advanced equipment sites for experimental work dedicated to the reduction of the earthquake threat (Figure 4). The current experimental reach of the equipment ranges from the marine to the geotechnical to the structural environments and can address almost any technical question that may arise on issues related to the safety of the built-environment in earthquakes. Development of this massive array of experimental capabilities demanded an intense and sustained effort. In retrospect, it would appear that the leaders of research groups involved in the creation of the 15 sites were totally absorbed, as they should have been, in the proper development of a magnificent experimental capability across the U.S. Unfortunately, there were three unplanned and unintended results: 1) a negative perception among a portion of the research community that equipment access was not equitable; 2) most, if not all, of the research work initiated has not yet been of a quality to transform the engineering community culture; and 3) the information technology infrastructure, which had initially inspired the NEES concept of a network of interconnected laboratories, has yet to reach its potential. The metaphor of a powerful fleet of battleships at anchor is not irrelevant to the current status. Our goal is to get the fleet moving in harmony.

Rapid advance in engineering knowledge and capability requires at least four ingredients: 1) a driving need; 2) a large community of well-educated professionals; 3) financial support; and 4) competing centers of research and development. As emphasized by the tragic disaster in Wenchuan, PRC, in May 2008, there continues to be a critical need for advances in earthquake-loss reduction. Considering the seismic histories of population centers such as San Francisco, Los Angeles, Katmandu, and Istanbul, there is no basis for expecting the earthquake threat to abate in the foreseeable future. In large measure because of the encouragement of the National Science Foundation since the early 1970's, the U.S. is blessed with an impressively large community of professionals well trained in earthquake engineering and related sciences. The first two ingredients are very much in place. As long as the U.S. continues to have a strong economic profile and maintains its proven ability to plan beyond the immediate future, financial support for research and development in earthquake issues will continue. Our mission, then, is for NEES to take the lead in providing the competing centers of research and development to achieve catalysis of the existing essential ingredients as described below. The seminal idea for the NEES network was the creation of an experimental-research infrastructure with many visions and capabilities at different research centers connected with a single purpose through the opportunity provided by information technology. The objective of creating a successful equipment infrastructure has been achieved. A driving challenge now is to resuscitate what was intended to be the cortex of the system: the information technology (IT) that can enable the required catalysis of ideas.

Strategic Plan

Our overall strategy is designed to: 1) inspire the NEES researcher to pursue a more ambitious research agenda; 2) entice the rest of the research community to compete for the opportunity to benefit from the sites; 3) encourage academic researchers to interact with the professional engineers in order to accelerate the implementation of new knowledge in practice; and 4) develop a NEES *community* that will include all individuals, institutes, agencies, corporations, professional societies, and non-governmental organizations (NGO) interested in protecting society from the harmful consequences of earthquakes.

A brief look at the history of civilizations will reveal that the nuclear ingredient in their development has been the "agora," or the market. Using the opportunities provided by information technology, we plan to develop the intellectual equivalent of the agora in order to get the "fleet at anchor" moving at an ever-increasing pace. We will employ operational excellence, innovative computational tools, outreach that advances knowledge, and an environment for the catalysis of ideas. Among the qualitative and quantitative performance metrics for measuring our success and developing a compelling basis for continued operation are: 1) the *satisfaction* of users (including both physical and analytical researchers); NEEShub users; and education, outreach and training targets; 2) a *greater diversification* of users, research sponsors, operations sponsors, outreach community, and the NEEShub community; 3)

Know Your Reviewer
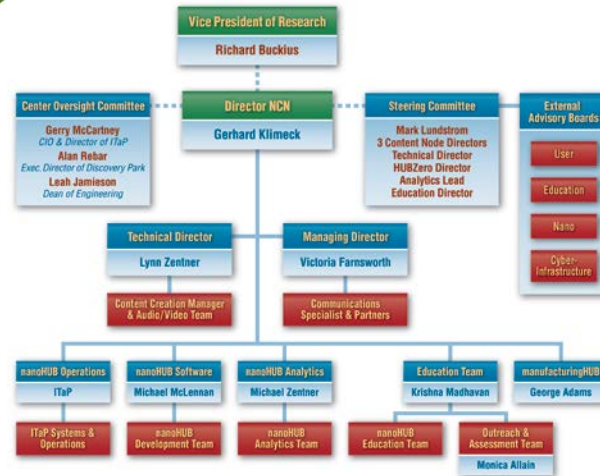
Sloppy writing = sloppy science
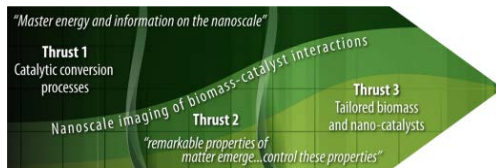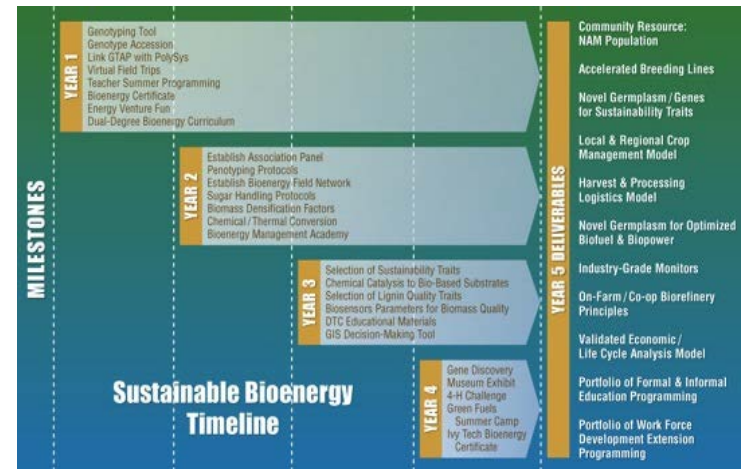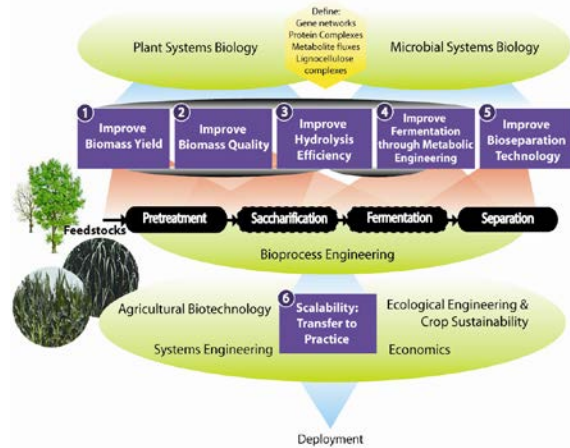
Know Your Reviewer

Elemental mapping of animal tissues has been investigated, and results have been documented.

changed to:

We investigated elemental mapping of animal tissues and documented results.

Know Your Reviewer

Use high-quality, easy-to-read graphics for conceptual and organizational info

Know Your Reviewer

Use visuals to summarize narrative when possible.

Program Initiatives	Year 1	Year 2	Year 3	Year 4	Year 5
Indiana administration					
Membership approved by Executive Council for working committees					
Partner retreat					
Create I-hub					
Create Passport tracking					
External Advisory Board meetings					
Annual Alliance-wide conference					
Goal 1: Alliance-wide practices					
Campus director monthly centralized training					
Augmented training sets					
Faculty/students training on I-hub					
Cross-Alliance recruiting, including veterans					
Goal 2: Effective community college partnership facilitating transfer to four-year STEM programs					
Co-mentored domestic research experience at partner campuses					
Co-mentored international research experience					
Industry guest speakers					
Cross-Alliance teaching symposia and workshops with community college faculty					
Goal 3: Aligning experiences with Tinto's principles of iteration					
Map activities and identify gaps					
Pair scholars with mentors					
Create individualized portfolios					
Map incentives to Passport Badges					
Cross-Alliance international research cohort					
Disseminate model-based best practices					
Goal 4: Research longitudinal model of Scholar development					
Compile a list of Scholar attributes					
Test and validate Scholar attributes					
Collect Scholar data					
Analyze Scholar data and portfolios					
Conduct interviews with Scholars					
Evaluation and Assessment					
Formative site visits					
Formative focus groups/interviews					
Formative web-based surveys					
Formative analysis and reporting					
Summative data plan development					
Summative quantitative data gathering					
Summative analysis and final reporting					

Key Strategies

- tell a compelling story

- respond to solicitation

- answer "

- know you

- conduct internal review

- planned from beginning
- formal or informal

Internal Review

New eyes on your draft before submission

General 10-week project timeline:

	1	2	3	4	5	6	7	8	9	10
Analysis and Planning										
Distribute documents noted in RFP	▓									
Identify previously successful proposals	▓									
Identify PI	▓									
Notify Pre-Award Center for assigned specialist	▓									
Problem Overview • *What is the problem* • *What has already been done to address problem* • *What gaps remain* • *How we propose to address gaps*	▓	▓	▓							
Vision			▓							
Goals			▓							
Identify proposal win themes/discriminators			▓							
Program Officer Input										
Contact PO	initial		▓							
Team debrief on meeting			▓							
Refine initial analysis/planning				▓						
Proposed Outline										
Discuss/refine outline structure				▓						
More detailed outline, if needed				▓						
Identify graphics needed			▓	▓						
Partnerships										
Recruit collaborative partners		▓	▓							
Produce "talking points" brochure or website			▓							
Recruit industry affiliates					▓	▓	▓	▓		
Recruit advisory board members						▓	▓	▓		
Collect letters of commitment						▓	▓	▓	▓	
Management and Personnel										
Identify basic management structure			▓	▓						
Collect biosketches			▓	▓	▓	▓	▓	▓		
Proposal Writing and Editing										
Assign writing			▓							
Write section components				▓	▓					
Compile 1st draft						▓				
Project team 1st edit							▓			
Any outside review input/edit	▒	▒	▒	▒	▒	▒	▓	▒	▒	▒
Editing iterations								▓	▓	▓
Write summary or abstract										▓

Red Text: Important to have agreement (and explicit text for problem overview) prior to proposal writing

Internal Review

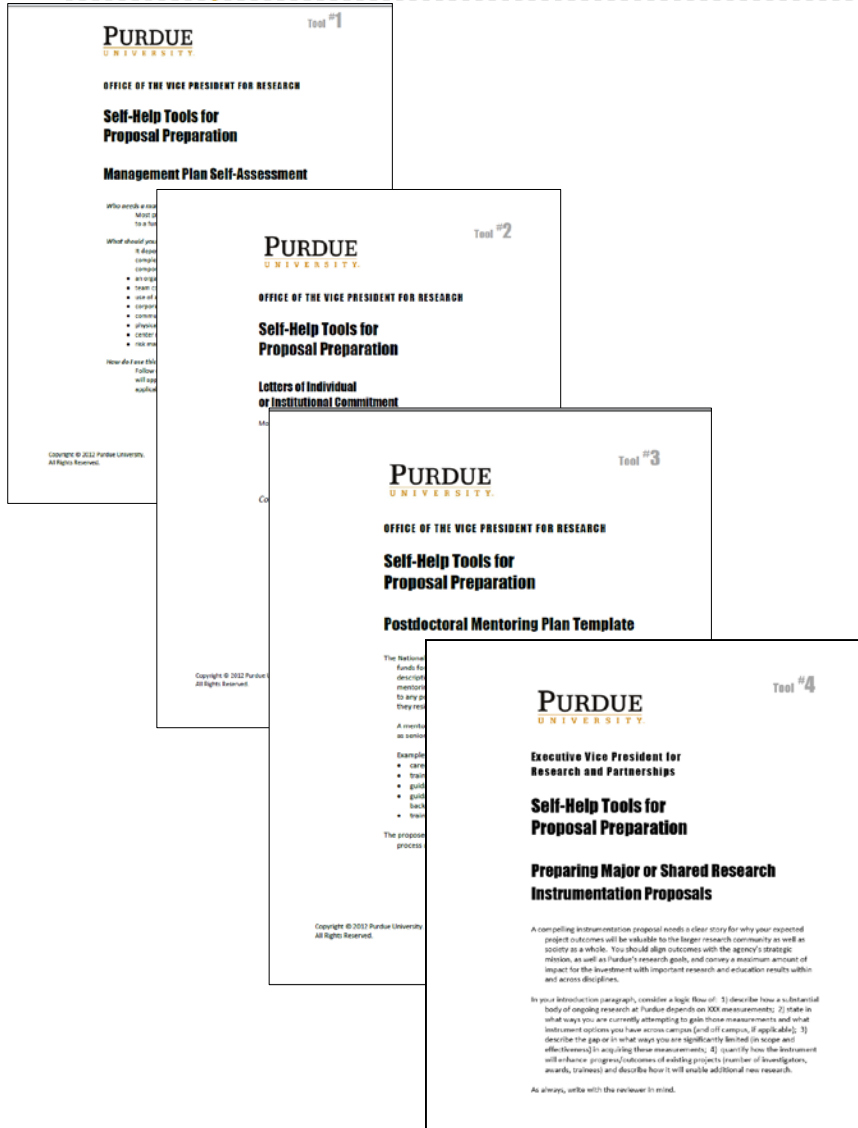## Because sometimes what is obvious to you is not obvious to others

What Else Can We Do for Your Proposal?

Writing content , leveraging resources, and managing the process

- one-page concept paper for PO
- campus partners and resources
- non-technical writing/editing
- document control
- supplementary documents
- graphics

Key Online Resources

- *Management Plan Self-Assessment*

- *Letters of Individual or Institutional Commitment*

- *Postdoctoral Mentoring Plan Template*

- *Tips for Major Research Instrumentation Proposals*

Key Online Resources

OVPR e-Pubs for searchable, citable, up-to-date institutional text

http://docs.lib.
purdue.edu/
ovpr/

Key Online Resources

OVPR e-Pubs for searchable, citable, up-to-date institutional text

Purdue University
Purdue e-Pubs

University General Facility Descriptions   Office of the Vice President of Research

2-21-2014

Discovery Park General Facilities Description

Candiss Vibbert
Purdue University, vibbert@purdue.edu

Purdue University Office of the Vice President for Research

Follow this and additional works at: http://docs.lib.purdue.edu/gendes

Recommended Citation
Vibbert, Candiss and Purdue University Office of the Vice President for Research, "Discovery Park General Facilities Descr
(2014). *University General Facility Descriptions*. Paper 2.
http://docs.lib.purdue.edu/gendes/2

This document has been made available through Purdue e-Pubs, a service of the Purdue University Libraries. Please contact epubs@purdu
additional information.

Discovery Park General Facilities

INITIATED: 2001
TOTAL BUILDINGS, EQUIPMENT, ENDOWMENTS, AND RESEARCH
EXPENDITURES AS OF DECEMBER 31, 2013: $1.02 billion

Explore Purdue's unique interdisciplinary facilities, cutting-edge equipment and shared spaces for collaborative projects in areas such as life and health sciences; drug discovery and development; energy, climate change, water, the environment and food security; information technology, homeland security, and simulation of modeling new materials; nanotechnology, bionanotechnology and nanomedicine; and science, technology, engineering and mathematics (STEM) learning.

Facilities attract researchers and students from all 11 West Lafayette colleges, Purdue's regional campuses, Purdue Technology Centers throughout Indiana, Indiana University and the Indiana University School of Medicine, and countries such as South Korea, Australia, China, Russia, Uganda, Colombia, India and Azerbaijan.

Discovery Park sits on 40 acres bounded by State Street on the north, Nimitz Drive on the south, Airport Road on the west and South Martin Jischke Drive on the east. Its location fosters collaboration with researchers in the nearby Martin C. Jischke Hall of Biomedical Engineering, Ray W. Herrick Laboratories, and the Wayne T. and Mary T. Hockmeyer Hall. Additionally, the Drug Discovery Facility is located on the main campus, and the Discovery Park Partners Facility is approximately 1/4 mile west of campus.

The Lilly Endowment provided generous initial funding for the centers and programs in Discovery Park, recognizing the potential of Purdue's commitment to advancing its interdisciplinary research and translational capabilities to a new level of excellence and impact.

UNIQUE FEATURES: All facilities are shared. Highly collaborative, interdisciplinary projects are connected throughout Purdue and to Purdue Research Parks. Technology commercialization is facilitated through the Burton D. Morgan Center for Entrepreneurship, an ecosystem on campus conducive to invention and entrepreneurism from the newest undergraduate to the most senior researcher, and the University's strong partnership with the Purdue Research Park.

ECONOMIC IMPACT TO DATE

EXTERNAL SPONSORED RESARCH: $824.4 as of 2/1/2014
PRIVATE DONATIONS INVESTED: $139 million
EQUIPMENT ADDED: $34 million
LABORATORY SPACE ADDED: 147, 502 sq ft.
OFFICE, MEETING SPACE ADDED: 107,299 sq ft.

Key Online Resources

Virtual Rolodex for broader impact partners at Purdue

http://catalog.e-digitaleditions.com/i/256966

Questions?

PURDUE
UNIVERSITY