Successful Grant Writing Strategies

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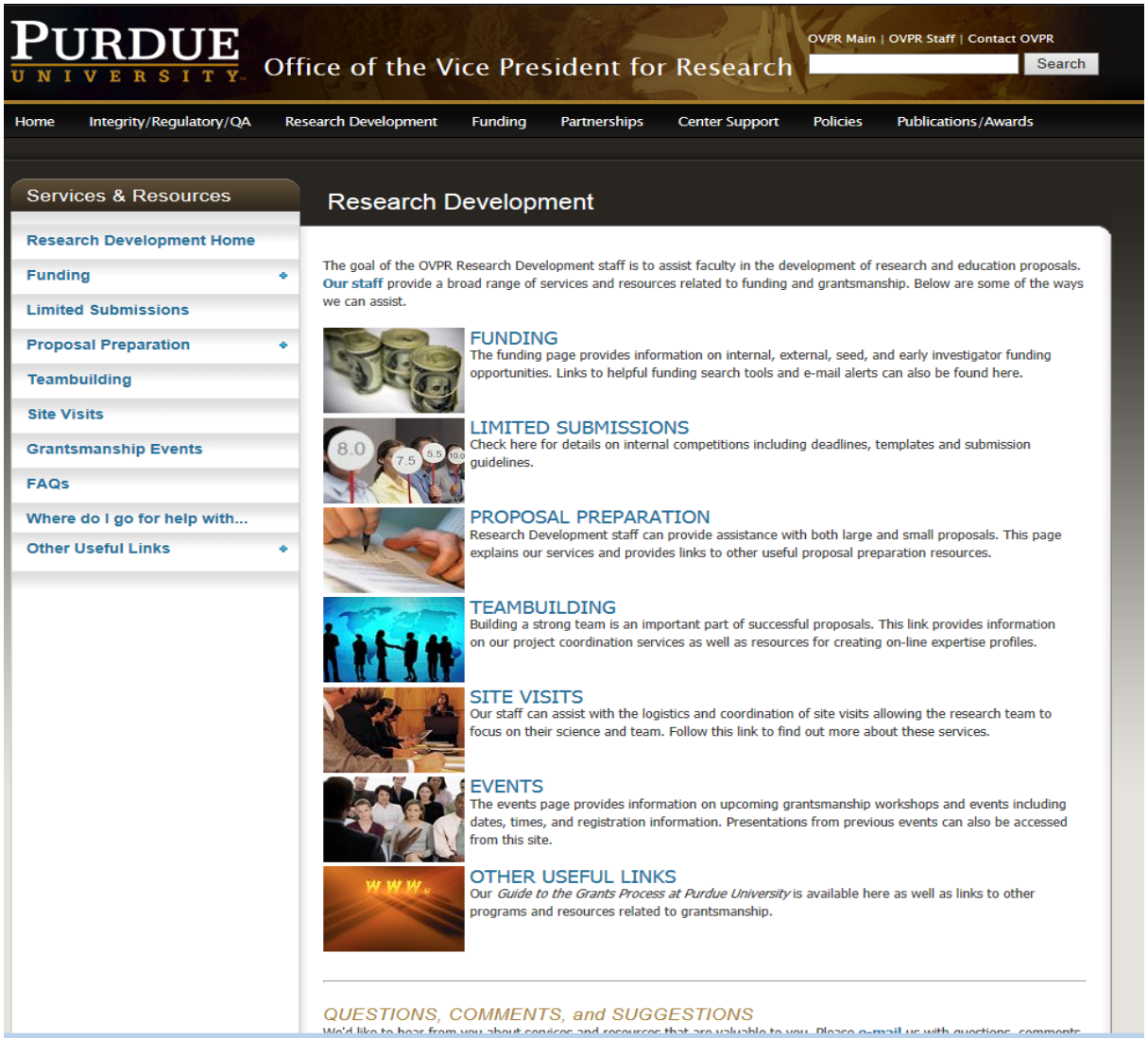
Purdue Research Development Services

Office for the Vice President for Research services and resources



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Grant Writing Assistance

Large proposal development and smaller proposal consultations

http://www.purdue.edu/research/vpr/rschdev/proposal_preparation_assistance.php

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Grant Writing Assistance

Grant Writing Resources

http://www.purdue.edu/research/vpr/rschdev/proposal_preparation_assistance.php

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Key Online Resources

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

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

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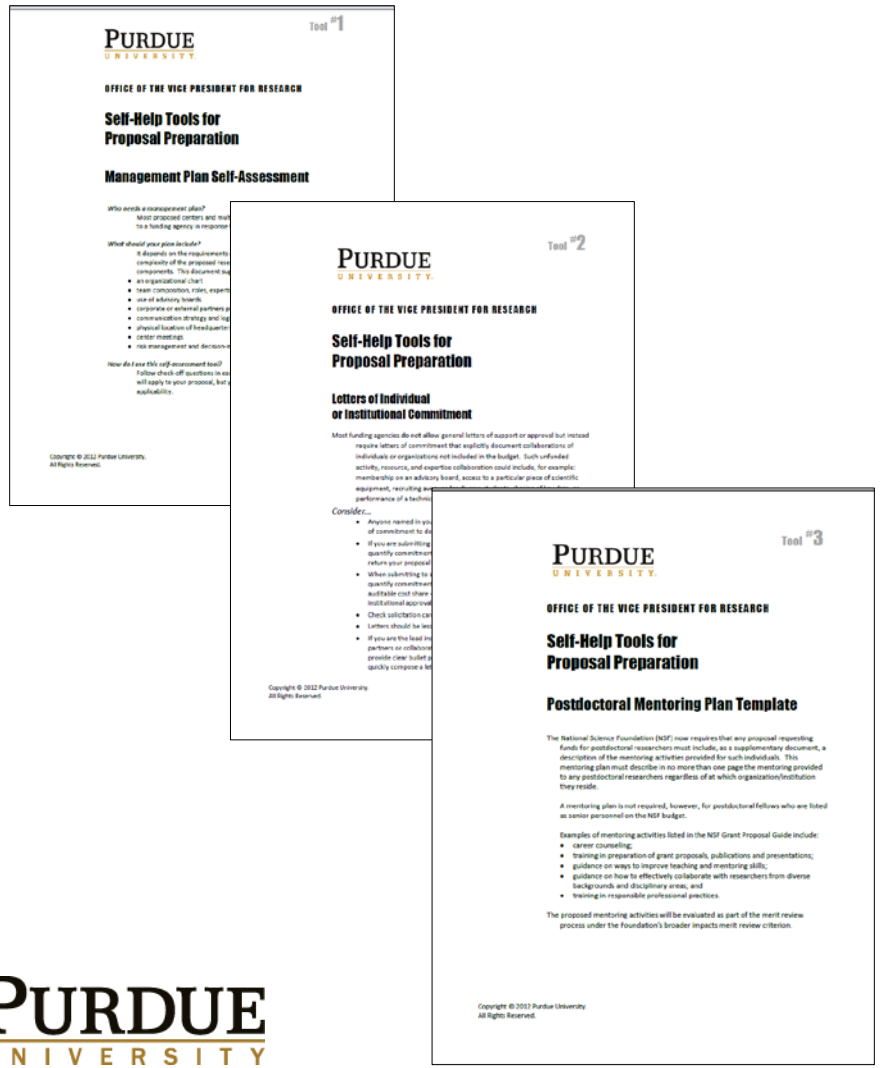
Key Online Resources

Self-help tool series



- *Management Plan Self-Assessment*
- *Letters of Individual or Institutional Commitment*
- *Postdoctoral Mentoring Plan Template*
- *Tips for Major Research Instrumentation Proposals* Coming soon!

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Where Do I Go for Help?

A Visual Guide to the Grants Process at Purdue

http://www.purdue.edu/research/vpr/rschdev/proposal_preparation_assistance.php

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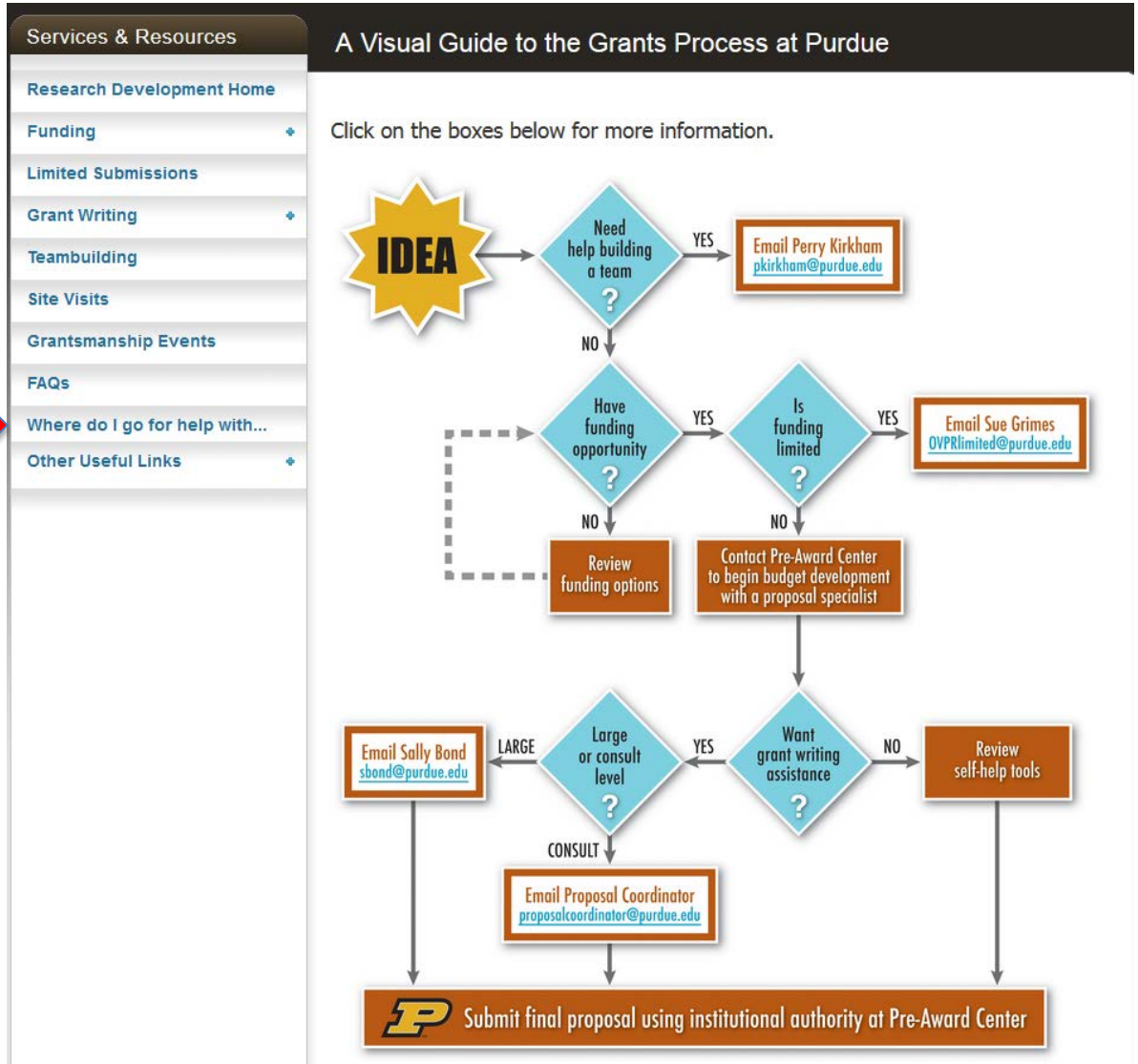
Where Do I Go for Help?

Hyperlinked "help" flowchart



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Being intentional

Basic grant writing strategies apply to almost any proposal

Figure removed for posting due to copyright

And so you just threw everything together?… Mathews, a posse is something you have to ***organize***."

From *The Far Side* by Gary Larson

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Proposal Preparation Timeline

Have a plan

General 10-week project timeline:

	1	2	3	4	5	6	7	8	9	10
Analysis and Planning										
Distribute documents noted in RFP										
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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*										
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Recruit collaborative partners										
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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

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Key Strategies

Avoid common trouble spots

- tell a compelling storyline
- answer “Why Purdue?”
- be responsive to solicitation
- know your reviewer
- conduct internal review

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Building the Storyline

Storyline first!

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- storyline provides the "north star"
- helps you not to be overly ambitious

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Building the Storyline

Four helpful questions

- 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?

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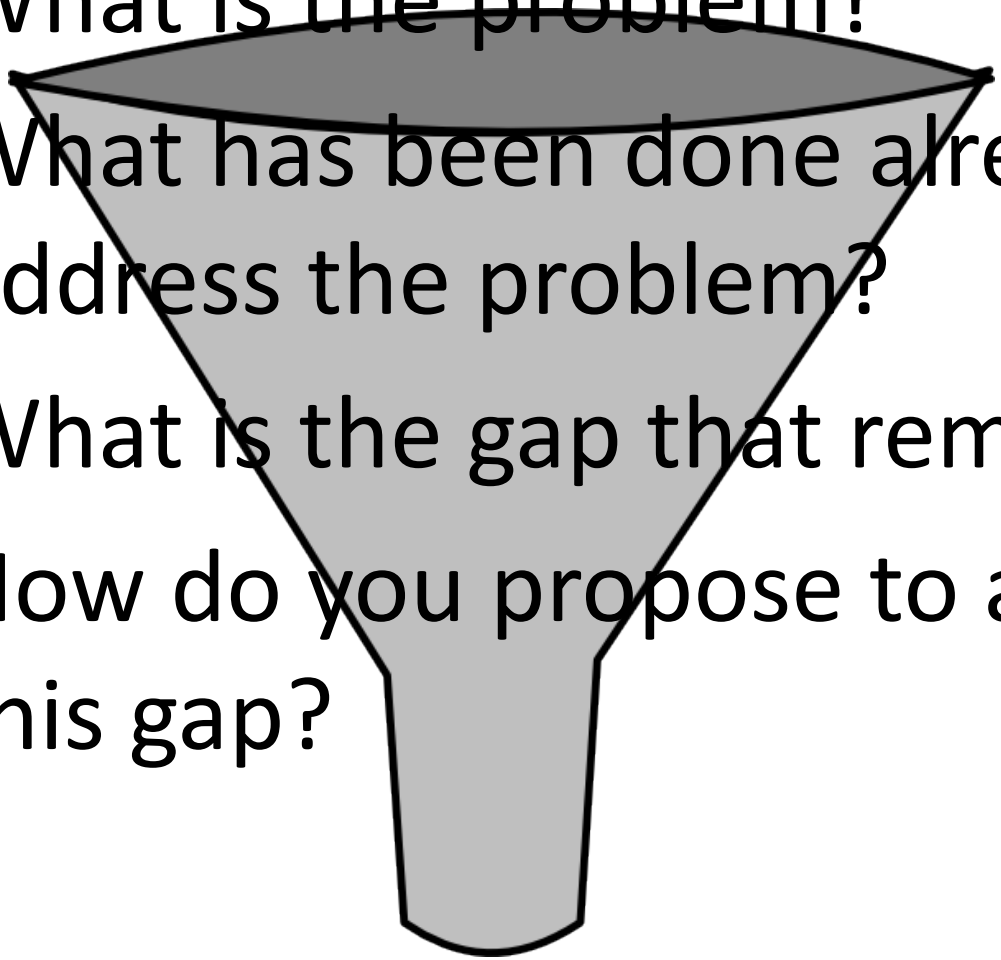
Building the Storyline

Logic flow goes from broad to narrower



- What is the problem?
- What has been done already to address the problem?
- What is the gap that remains?
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Building the Storyline

Example narrative…in op-ed language

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

EXAMPLE 2

NSF IGERT: Solar Economy IGERT (SEIGERT)
PI: Rakesh Agrawal

2. Vision, Goals, and Thematic Basis

Currently, fossil fuel resources of coal, natural gas and petroleum supply nearly 85% of the total energy needs of the US economy. The flow of energy from fossil fuels to end-uses: 1) electricity, 2) heating, 3) chemicals, and 4) transportation is a complex system dictated by resource availability, processing capacity, government policy, world affairs, and market forces. However, recent volatility of petroleum prices, uncertainty of future carbon taxes, and the potential impact of greenhouse gasses on the environment has led to renewed efforts to reduce our dependence on fossil fuels.

Recently, 25 U.S. state legislatures passed legislation that establishes minimum percentages of the state's electricity supply that must come from renewables by a certain date. These so-called Renewable Portfolio Standards (RPS) are shown in Figure 1. The states with RPS account for over half the nation's electricity. The implementation of RPS presents the U.S. with great opportunities and challenges. Currently, the total primary power used in the U.S. by all four major end-uses is 3.3 TW (PCAST, 2006). When averaged over day, night, seasons, and cloud cover, over 1800 TW of sunlight falls on U.S. land. Clearly, economic collection and transformation of solar energy can provide a long-term solution for all the energy needs of the United States.

For decades, the U.S. enjoyed global leadership in solar energy innovation and market share. By 2005, however, the U.S. share of the world production capacity of solar cell modules dropped to 8% while shipments from Europe and Japan increased to 26% and 48%, respectively (EIA, 2007). The economic effect of the decreasing U.S. market share is exacerbated by a rapidly increasing need for solar cell manufacturing. The U.S. Photovoltaic Industry Roadmap foresees a 30% growth of the world solar industry over the next decade and a U.S. solar industry that needs to employ 250,000 people by 2030 (DOE, 2001). However, at a time when U.S. states and industry need a significant increase of highly skilled labor with solar energy expertise, the supply of Ph.D.s in this area is limited Further, of all the research articles published on solar energy, the fraction published by U.S. authors has dropped significantly in the last 30 years, from 49% to 18%. More importantly, of all the journal citations for articles on solar energy, the fraction of citations that U.S. authors receive is down from 61% to 24% in that same time period (Hillhouse, 2007). The output and impact of U.S. research on solar energy is diminishing. These trends clearly define a challenge of national importance. *It is imperative that the U.S. strategy include effective education and training programs to develop the human resources and intellectual capital that will allow us to compete in this emerging world market for* **Sun-to-Electricity**. Our ***vision*** is to prepare for a fossil fuel-deprived world where nearly all energy demands are met sustainably by solar energy resources.

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Building the Storyline

Create a one-page brief

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

- concise storyline
- vision/goals
- team
- methodology/approach
- impact

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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

Why Purdue?

You, your team, your institution

- researcher expertise
- equipment and facilities
- Purdue experience and campus environment
- strength or uniqueness of academic programs
- prior work

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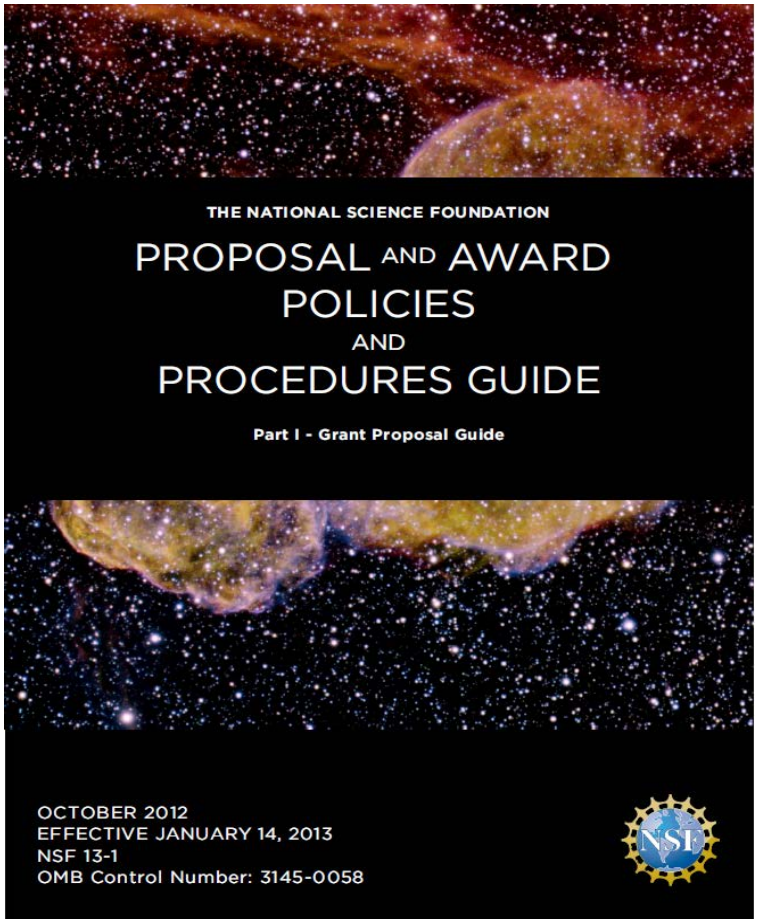
Responding to Solicitation

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

Responding to Solicitation

Outline before you write

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/Objectives
   - 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
- Provide detailed descriptions of examples of research projects
- 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
CICA WEST 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 perceptself-efficprod						
Attitudinal Surveys						
Deans and Heads						
Faculty						
Network Analysis						
External Project Analysis						
Dissemination						
Website						
CIC *Women in Academia*						
Summit Attendees Mailings						
Publications						
National Presentations						

3. **The 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
   - Include information on the record of faculty/mentors in publishing work and providing professional development opportunities for K-12 STEM teachers and/or community college faculty
     - Mention Prof. Jones most cited article
   - Describe facilities, equipment, and other resources available to support the proposed research experiences in relation to those activities

4. **Participant Recruitment and Selection [.75 page]**
   - Describe types and/or names of institutions where participants will be recruited
     - Drawing on strong network of partners through DLRC
     - Recommended that at least two STEM teachers per school
     - Should participate for two consecutive year

5. **Results from Prior Support [2 pages]**
   - Use sample format

Knowing Your Audience

How is your reviewer reading your draft? How can you help?

- sleepless, busy, rushed
- stack of 25 proposals to review
- reading proposal on plane or late at night
- perhaps not an expert in your exact field

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Internal Review

New eyes on your draft before submission

General 10-week project timeline:

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- at least two weeks prior to submission
- requires intentional planning from project beginning
- formal or informal

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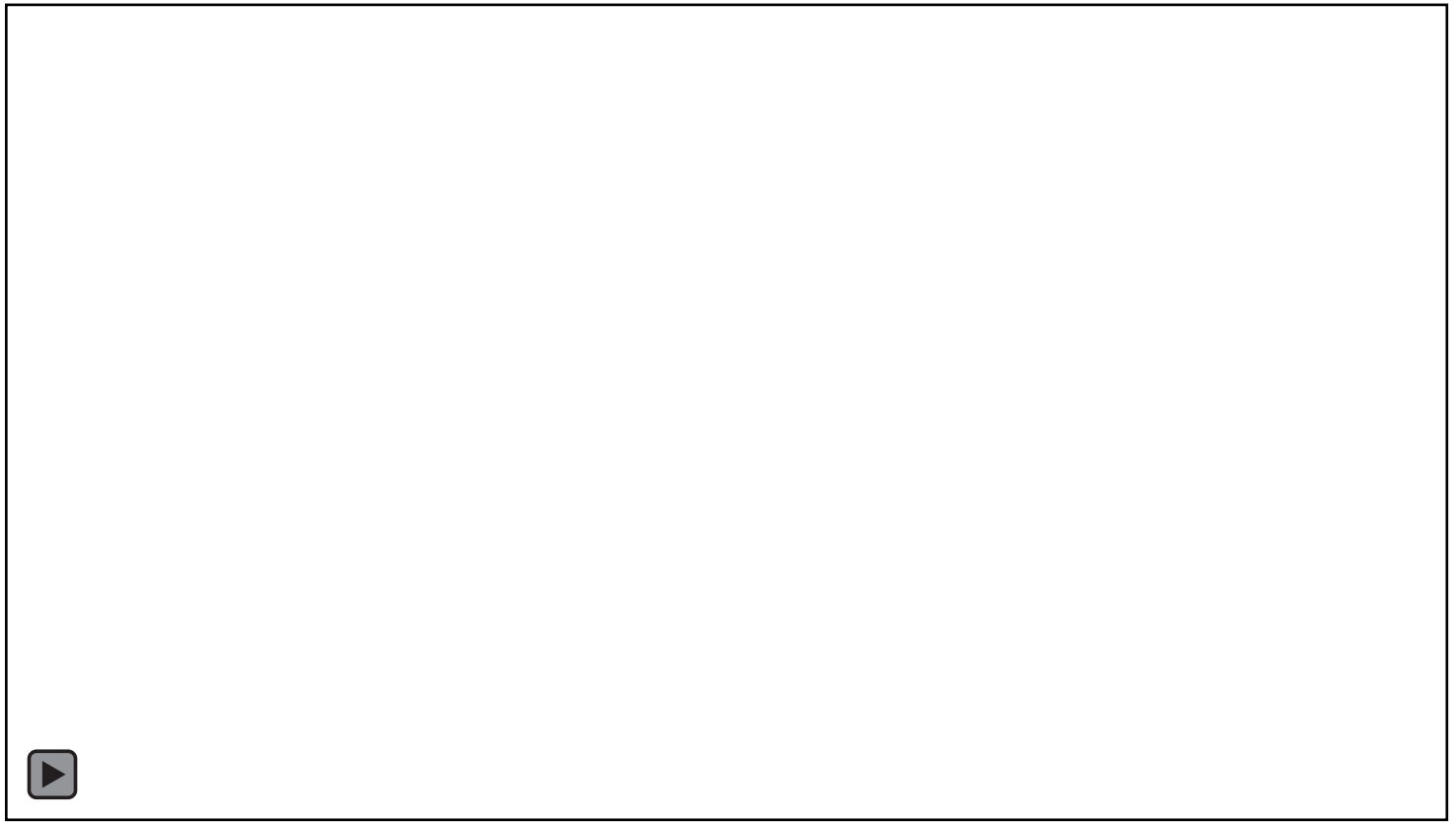
Internal Review

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



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Questions?

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