

# Proposals and the NSF:

A Personal Perspective from an  
Often Declined but Sometimes  
Funded PI as well as Previous  
Program and Division Director



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*CESE & EEB*

# OUTLINE

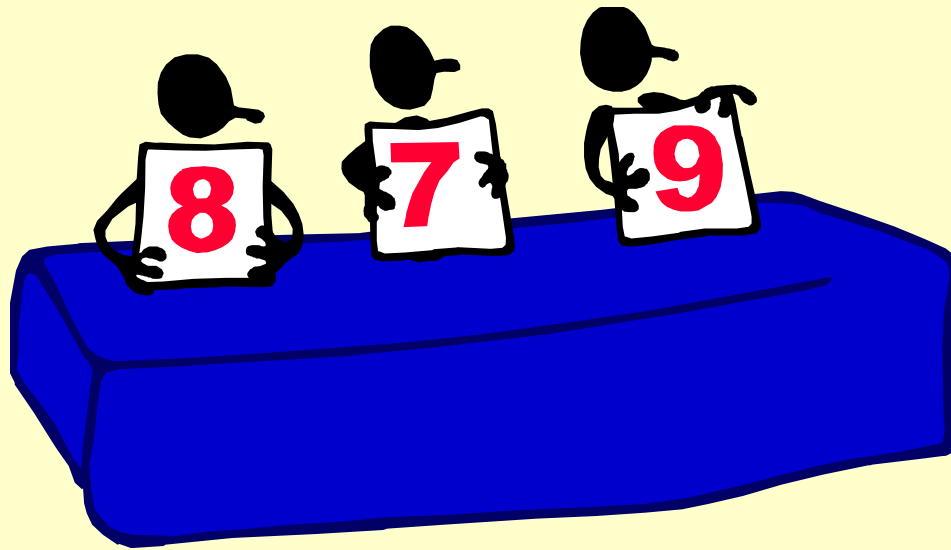
## NSF Review Process

### Crafting a Successful Proposal



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# NSF Merit Review Process

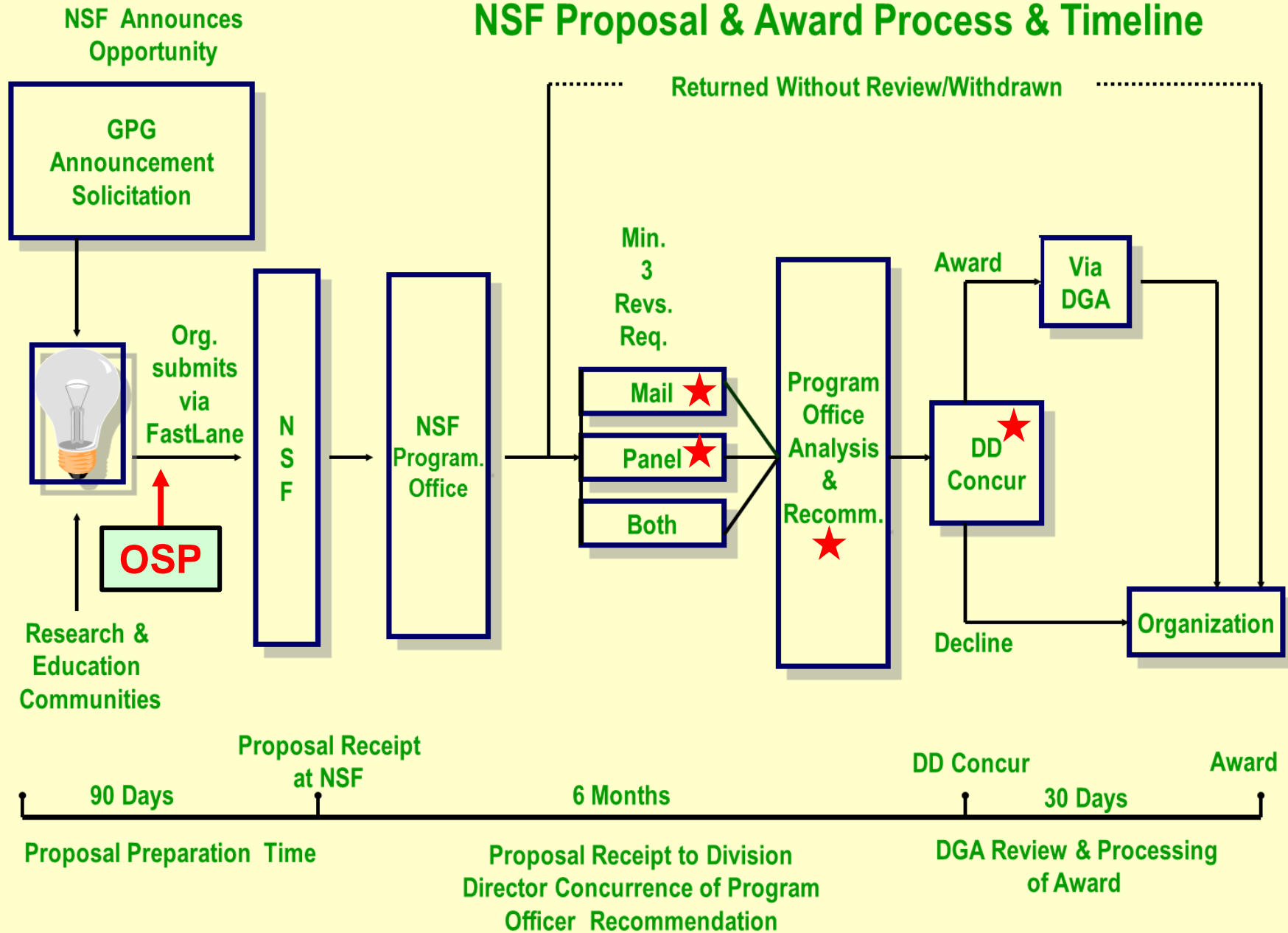


External Review by Experts (Panel & Ad Hoc)



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# NSF Proposal & Award Process & Timeline



# NSF Merit Review Criteria

**Intellectual Merit**

**Broader Impacts**



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# Proposal Review Criterion: *Intellectual Merit*

- Potential to advance knowledge and understanding within and across fields
- Qualifications of investigators
- Creativity and originality
- Conceptualization and organization
- Access to resources



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# Proposal Review Criterion: *Broader Impacts*

- Advances discovery while promoting teaching, training and learning
- Broadens participation of underrepresented groups
- Enhances the infrastructure for research and education, such as facilities, instrumentation, networks and partnerships
- Results disseminated broadly
- Potential benefits to society



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**CAUTION!!!**

*Any proposal that does NOT address  
both merit criteria  
in the Project Summary  
will be*

**RETURNED WITHOUT REVIEW**



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# Return Without Review

- Does not meet NSF proposal preparation requirements, such as page limitations, formatting, etc.
- Is inappropriate for funding by the NSF.
- Is not responsive to the GPG or program announcement or solicitation.
- Does not meet an announced proposal deadline date.
- Is a duplicate of, or substantially similar to, a proposal already under consideration.
- Was previously reviewed and declined but has not been substantially revised.



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# NSF Sources of Reviewers

- Program Officer's knowledge
- References listed in proposal
- Recent authors in journals
- WWW
- Reviewer recommendations
- **Investigator's suggestions**



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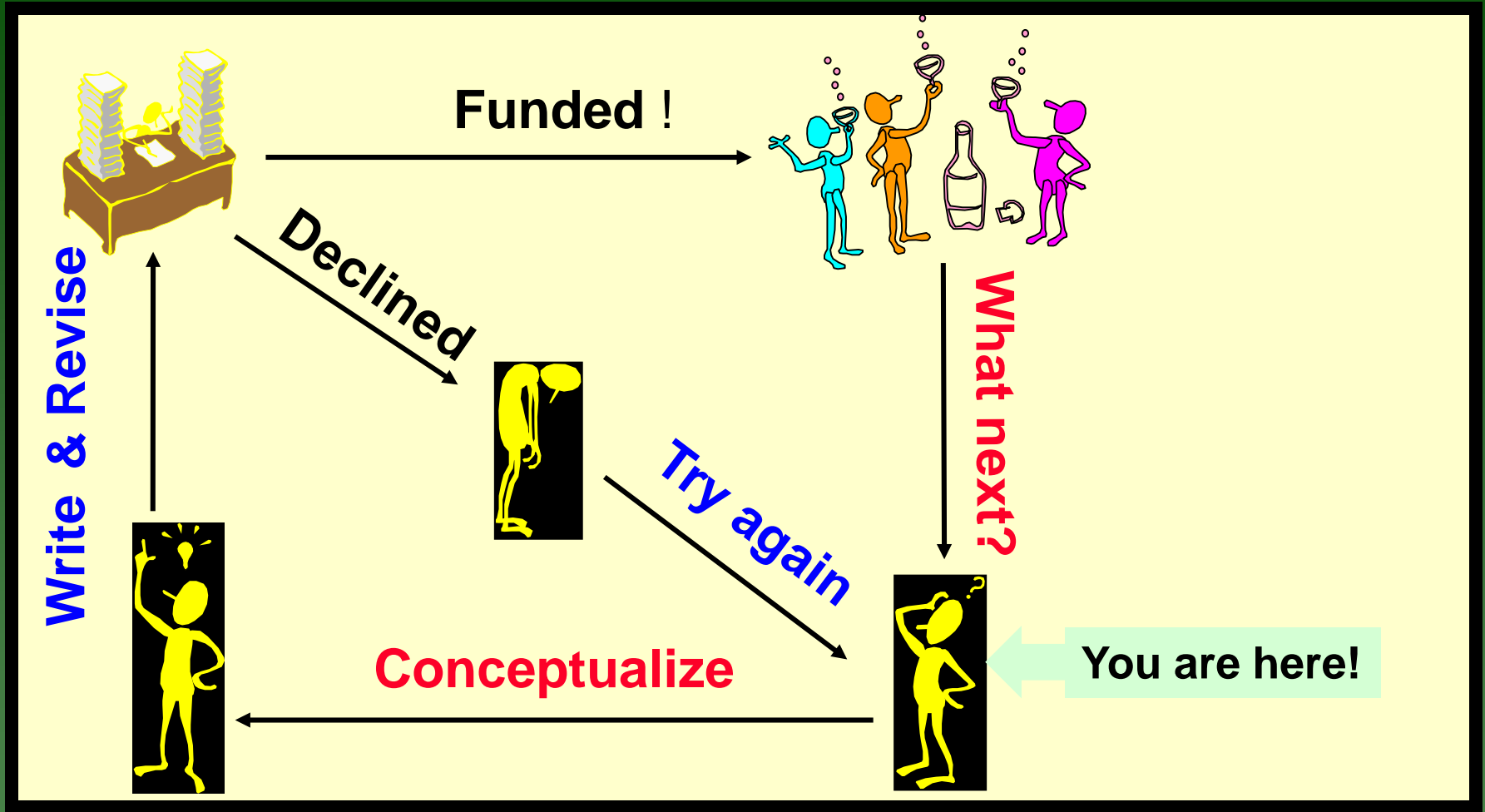
# Reasons For Funding

- **High Scientific Impact**
- **PI Career Point**
- **Place in Program Portfolio**
- **Other Support for PI**
- **Impact on Institution or State**
- **High Educational Impact**
- **Diversity**
- **“Launching” versus “Maintaining”**
- **Special Programmatic Considerations (CAREER/RUI/EPSCoR)**



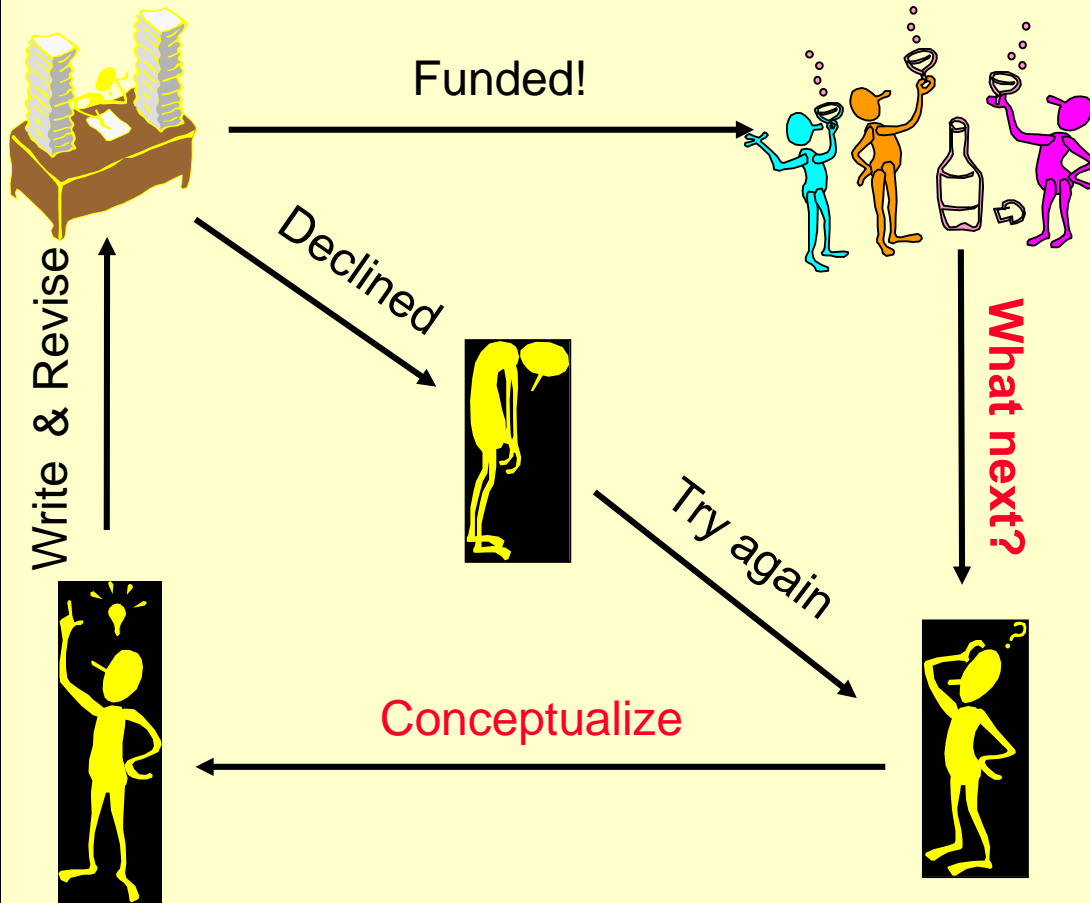
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# Proposal Cycle



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# Proposal Cycle



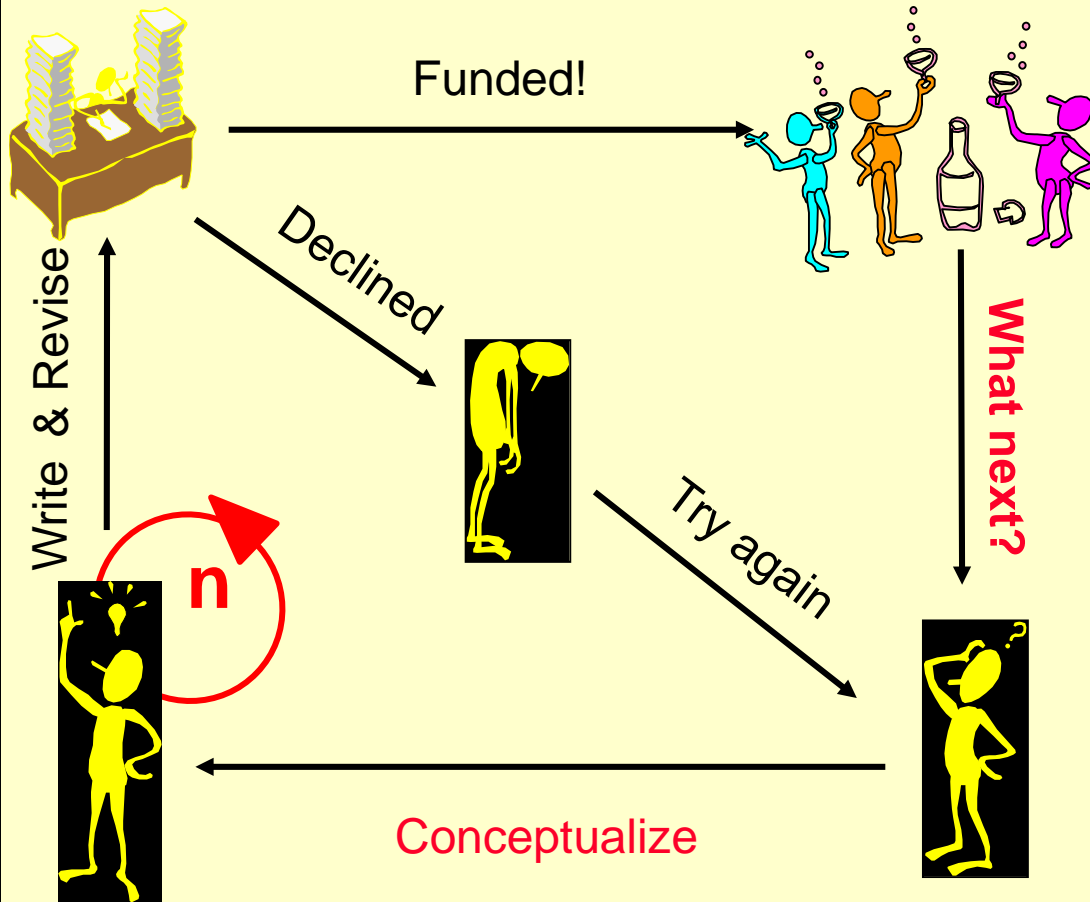
## CONCEPTUALIZE

Theory  
Data (Observations)  
Controversies  
Literature  
Colleagues  
Successful PIs  
Program Officers  
Successful Proposals



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# Proposal Cycle



## CONCEPTUALIZE

Theory  
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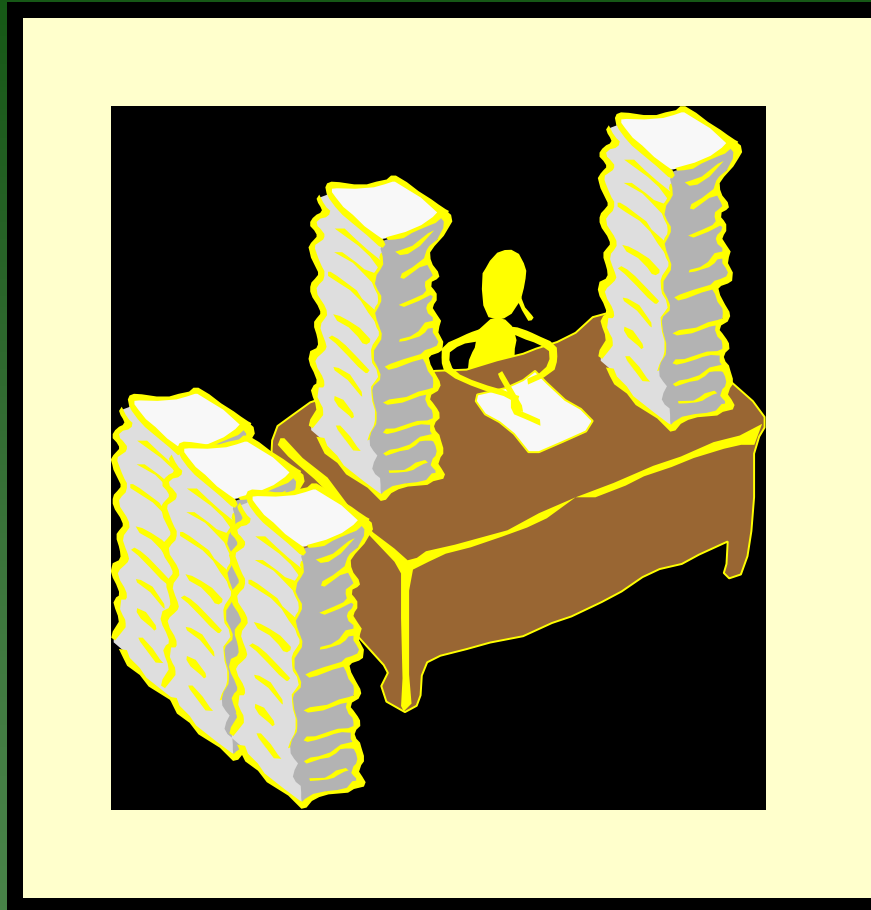
# Summary

*A good proposal is a **good idea**, well expressed, with a clear indication of **methods** for pursuing the idea, **evaluating** the findings, **making them known** to all who need to know, and indicating the **broader impacts** of the activity.*



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# Proposal Preparation



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# Grant Proposal Guide (GPG)

- Provides guidance for preparation of proposals
- Describes process -- and criteria -- by which proposals are reviewed
- Describes process for withdrawals, returns and declinations
- Describes the award process and procedures for requesting continued support
- Identifies significant grant administrative highlights

[http://www.nsf.gov/pubs/policydocs/pappguide/nsf14001/gpg\\_index.jsp](http://www.nsf.gov/pubs/policydocs/pappguide/nsf14001/gpg_index.jsp)



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# What to Look for in a Program Announcement (Solicitation)

- **Goal of Program**
- **Eligibility**
- **Special Requirements**



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# A Good Proposal

A good proposal is a good idea, well expressed, with a clear indication of methods for pursuing the idea, evaluating the findings, and making them known to all who need to know.

# A *Competitive* Proposal

All of the above  
Appropriate for the Program  
Responsive to the Program Announcement



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# What is a Competitive Proposal?

- ✓ Likely high impact
- ✓ New and original ideas
- ✓ Succinct, focused project plan
- ✓ Knowledge of subject area
- ✓ Experience in essential methodology
- ✓ Clarity concerning future directions
- ✓ Sound scientific rationale
- ✓ Realistic amount of work
- ✓ Sufficient detail
- ✓ Critical or innovative approach



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# What Makes a Proposal *Transformative?*

**Results & Conclusions have the potential to:**

- **Contribute more than an incremental advance in understanding (i.e., saltation)**
- **Effect change in theory or paradigms**
- **Transcend “sub-disciplinary” boundaries**
- **Ramify throughout other disciplines**



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# Procedural Issues

- Follow **formatting** requirements carefully
- Compliance check before submitting  
(FastLane won't do it for you!)
- Be available by e-mail to fix compliance problems  
(proposals may be returned if NSF can't contact you)
- Suggest reviewers (not DDIG)
- Include all **conflicts of interest** in your Biosketch
- Respond **explicitly** to previous reviews  
(Panels are asked to comment on this)
- Emphasize **readability**; avoid verbiage
- Talk to your **Program Director!**



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# Advice

- Love to learn from rejection
- Contact the program officer with specific questions (do your homework)
- Friendly review
- Revise and resubmit
- Collaboration is good, if appropriate
- Discover alternative funding sources



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# Overview

- ✓ **Idea development**
- ✓ **Less verbiage, more readability**
- ✓ **Anticipate objections or criticisms**
- ✓ **Justify your budget (Don' t be greedy)**
- ✓ **Follow the rules**
- ✓ **Give yourself plenty of time**
- ✓ **Study reviews carefully**



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# Reiteration

- Learn from the past (rejections & funded proposals)
- Link to theory or controversy (conceptual diagrams)
- Synergistic constituent hypotheses (designed for success regardless of outcome)
- Clearly written
- Broader impacts that make sense (nature of research, past involvement, novel/innovative, budget items)
- Seek critical reviews of exposition and science (students, intramural colleagues, external experts)



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# Project Summary

First impression of the proposed project  
(this is the hook)

Highlight the transformative and  
conceptual nature of the proposed project

Realistic broader impacts for a grant to  
improve dissertation research



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# Essentials

*Know your audience*

*Conceptual diagram (roadmap)*

*Organization*

*Integration*

*Synthesis*

*Transformative elements*

*Preliminary Results*

*Clear methods (not ponderous)*

*Appropriate citations (knowledge of field)*



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# Essentials

*Know your audience*

*3-4 Reviewers*

*Program Officers*

*Not all experts in your field*

*Reading 15-20 Proposals*

**Help them to see the forest for the trees!**



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# Essentials

## *Conceptual diagram (roadmap)*

Links the major parts of your proposal

Shows the major drivers and respondents

Places research in broader context

*Help them to see the forest for the trees!*



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# Essentials

## *Organization (Predictive)*

### *I. Topic One*

*A. Hypothesis 1a*

*B. Hypothesis 1b*

### *II. Topic Two*

*A. Hypothesis 2a*

*B. Hypothesis 2b*



**Multiple  
Competing  
Hypotheses**

***Regardless of outcome science is advanced***



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# Essentials

## *Integration & Synthesis*

How do the parts add up:  $1 + 1 = 2$ ?

Is the whole greater than the sum of the parts:  $1 + 1 \gg 2$ ?

How will your work combine with extant knowledge?



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# Essentials

## *Transformative elements*

How does your work change the way we think?

Does your work contribute in more than an incremental manner?

High risk: High Payoff!



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# Essentials

## *Preliminary Results*

Summarize to show the compelling nature  
of your work

Summarize to document a high likelihood  
of success



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# Essentials

*Clear Methods (not ponderous)*

Sufficient to understand what you will do in  
field or laboratory

Document state of the art approaches

Include how you will analyze data



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# Essentials

*Appropriate Citations  
(knowledge of field)*

*Some from your lab*

*Foundational literature*

*Most recent literature*



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# Essentials

*Tell them what you are going to  
tell them.*

*Tell them.*

*Tell them what you told them.*



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# Writing Style

*Mix of simple, compound, & complex sentences*

*Write for the “ignorant” but intelligent reader*

*Avoid ambiguity*



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# Writing Style

*Format (ease of reading)*

*Clear sections, sub-sections, & parts ... can save text*

*Bold, italics, and color*

*Necessary and incisive figures*



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