Planning, Managing, and Funding the Research Project

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What we will cover today...

Where you are in the universe...

Research: attributes and drivers...

What gets funded...?

Tips on what is important in obtaining funding...
The Education-Research Universe

Graduate School

Assorted Fellowships

Dissertation Grants

Post-Doc Fellowships

Fellowships for Early Grad Students

Senior Year Undergrad

1st Year

Finish classes Exam/Defense/ Candidacy (ABD)

Dissertation Work

Post-Doc?

The remainder of your life…
Faculty Research Cycle & Research Development

1. Receive Funding
2. Carry out Research
3. Interpret & Analyze Results
4. Publish & Present
5. Hypotheses & (new) Research Questions
6. Conceptual Development
7. Broader Impacts, Diversity and Evaluation
8. Contacting Agencies
9. Proposal Writing, Editing and Design
10. Receive Funding $
11. Budgeting and Negotiations
12. Research Development Support

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Nature of Research...A noble pursuit

- Purposes-Intrinsically valued for a focus on understanding the universe and our place in it...Epistemological- seeking truth ...beauty
  Ontological-seeking meaning...Transformational

- Human relationship to nature...endless (?) frontier
Inspiration

Observation

Curiosity

Wanderlust - Exploration

Hypotheses, goals and objectives

Problem-based: What is the mother of invention?

The Market and other motives
Types of research...by attribute

- Creative / Aesthetics
- Basic/Fundamental
- Applied
- Developmental
- Evaluative
Pasteur's Quadrant

- Pure basic research (Bohr)
- Use-inspired basic research (Pasteur)
- Pure applied research (Edison)

Relevance for immediate applications
Relevant for the advancement of knowledge
What forces are impacting research and discovery

- **Globalization-speed** of computing and communications, complexity, diversity, competing ideologies
- Rapid advances in **Technological capabilities**
- **Information explosion** - plethora of data available for analysis
- Need to tackle **complex, interdisciplinary** problems at appropriate scales
- Need to **compete (innovate)** to create a sustainable future, a living standard, power base, quality of life...
Because your research:
- Is unique, innovative, creative
- Advances knowledge in the field
- Builds on the work of others
- Inspired confidence in your ability and your methods/plan
- You took away every reason for reviewers to say “no”

Because the funder:
- Has your topic as a priority (i.e., if you succeed, it helps them carry out the mission)
- Has funding available

Always remember the Golden Rule…
Target the research proposal at the intersection where:

- research dollars are available
- your research interests are met
- a competitive proposal can be written within the time available.
Scoring Grant Applications Is Like Judging Different Breeds of Dogs at a Dog Show

They are judged against an ideal breed standard, not against each other.

How to put your best dog in the show...
Winning Proposals are well written

- Look professional
- Do not contain mistakes
- Hold and keep the reader’s interest
- Provide just enough detail…
- Well reasoned and measured--coherent
- Assure the reviewer of your competence and capability
- Creative, innovative AND practical
- Reflect your ability to hone in on key issues and prioritize your messages
“There is no amount of grantsmanship that will turn a bad idea into a good one, but there are many ways to disguise a good one.”

William Raub
former Deputy Director, NIH
Focus on your research interests
Your job as applicant? Intrigue the Reviewers

Thomas Mangelsen
Follow directions!!
Review it step by step
Understood by you and your advisor
Keep focused
Don’t wander off path
Use the RFP to organize your writing

- Use the RFP to develop the structure, order, and detail of the proposal narrative.
- Use the RFP as an organizational template during proposal development to help ensure every RFP requirement is addressed fully.
Clarify ambiguities in the RFP

- Ambiguities need to be resolved prior to proposal writing

- If unresolved---
  - Get clarification
Never be timid about contacting a program officer for clarification

- Timidity is never rewarded in the competitive grant process.

- Arrogance? It depends.
NSF Proposal & Award Process & Timeline

**NSF Announces Opportunity**

- Announcement Solicitation
  - Org. submits via FastLane or Grants.gov
  - Research & Education Communities

**NSF**

- NSF Program Officer
  - Proposal Receipt at NSF
    - 90 Days
    - Proposal Preparation Time

- Min 3 reviews
  - Panel
    - Mail (adhoc)
    - Both

- Program Officer Analysis & Recom.
  - Division Director Concur
    - 6 Months
    - Proposal Receipt to Division Director Concurrence of Program Officer Recommendation
    - DD Concur
      - 30 Days
      - DGA Review & Processing of Award
      - Award
      - Decline
        - Organization
        - Returned Without Review/Withdrawn
NSF Proposal Review Criterion: Intellectual Merit

- Potential to advance knowledge within and across fields
- Qualifications of investigators
- Creativity, originality, transformative
- Conceptualization and organization
- Access to Resources
NSF Proposal Review Criterion: Broader Impacts

- Promote teaching, training and learning while advancing discovery
- Broaden participation of underrepresented groups
- Enhance infrastructure (facilities, networks) for research and education
- Disseminate results to advance scientific and technical understanding
- Benefits to society

NSF Program Officers have significant discretion to make recommendations - Reviewers provide advice.

Most proposals that are awarded do not receive all “Excellent” reviews.

NSF Program Officers are encouraged to recommend “risky” science and engineering for funding.

Only a handful of Declined proposals are Appealed - NSF received 34 formal reconsideration requests in FY 2007; 33 decline decisions were upheld and one was reversed.
Points to Emphasize

- State benefits of your research clearly
  - Why is it important and how is it novel?
  - How will it advance knowledge in field?
  - Societal benefits

- Research Plan should be specific and detailed
  - Clearly state measurable goals and outcomes
  - Discuss how you will address any possible problems

- Be sure to emphasize integration of education and research
  - Measurable goals (e.g., number of students, diversity goals, etc.)
  - Connect to existing NSF projects if possible

- Eliminate Ambiguity!!!
Selected TIPS from Insiders

- “READ the RFP carefully [again]” (Finger)
- “Frame your Research Project around the work of others” (Hazelrigg)
- “Contact the Program Manager” (everyone)
- “Proof Read” (Hazelrigg) Let others look at your drafts
- “Remember ‘the ill and unfit choice of words wonderfully obstructs the understanding’ [Francis Bacon]” (Karentz)
- Be sure to address Intellectual Merit and Broader Impacts in your Abstract
Final Exam

Which one of the following attributes was found to be significant in a study by the National Science Foundation of “which projects get funded?”

- ACADEMIC REPUTATION OF UNIVERSITY
- ACADEMIC CREDENTIALS OF INVESTIGATOR
- REASONNABLENESS OF THE BUDGET REQUEST
- NUMBER OF PREVIOUS ATTEMPTS OF APPLICANT
- NUMBER OF PUBLICATIONS IN TOP TIER JOURNALS
THANK YOU

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