Grantsmanship and Getting Research Funded

TAMU Engineering Staff Retreat
Post-Doctoral Researcher Session
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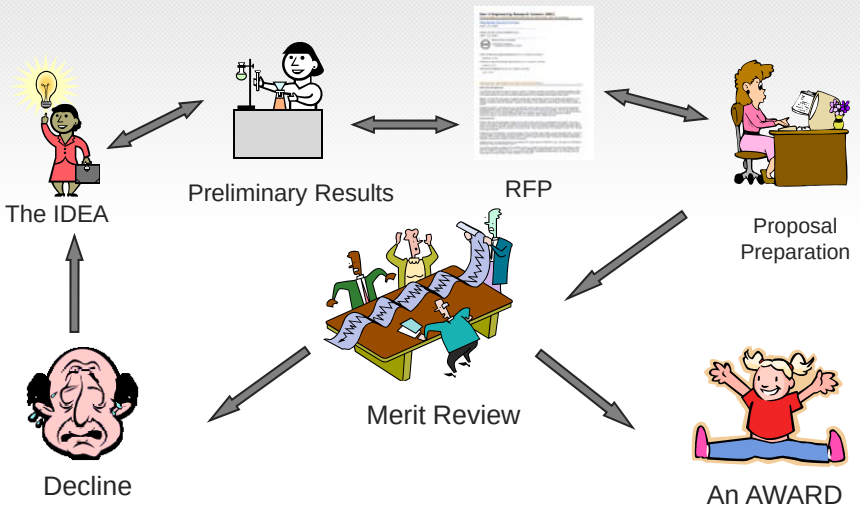
Laurie Garton, Ph.D.
Sr. Research Development Officer
TEES Research Development
Lsgarton@tamu.edu

Proposal Cycle



Workshop Outline

- Funding Sources
- Proposal Logic
- Project Research Goal
- Parts of A Proposal
- Budget Planning
- Review Process and Criteria

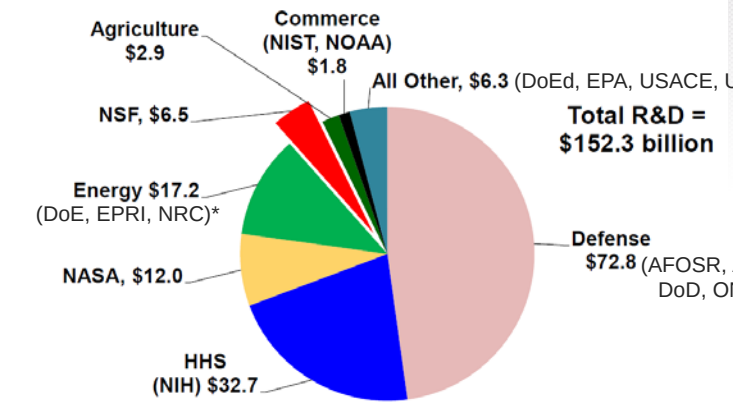
Funding Sources

Some Federal Funding Sources

- AFOSR – Air Force Office Of Scientific Research
- AFRL – Air Force Research Laboratory
- DoD – Department Of Defense
- DoE – Department Of Energy
- DoEd – Department Of Education
- DHS – Department Of Homeland Security
- EPA – Environmental Protection Agency
- EPRI – Electric Power Research Institute
- NASA – National Aeronautics And Space Administration
- NIH – National Institutes Of Health
- NRC – Nuclear Regulatory Commission
- NSF – National Science Foundation
- ONR – Office Of Naval Research
- USACE – Army Corps Of Engineers
- USDA – US Department of Agriculture
- USDOT – Department Of Transportation

FY 2017 Request: Total R&D by Agency

Budget Authority in Billions of Dollars



Working with NSF and NIH

- Peer-reviewed
- NSF
  - Supports Basic Research and Education
  - Discipline-based structure
  - Ad hoc review – panels or mail-in
  - Ask PO if you can serve on a panel
- NIH
  - Health-related outcomes research
  - 21 institutes and 6 centers
  - Standing panels – study sections
  - R01 funded are asked to serve on study sections

Working with DoD

DoD – Department of Defense

- Funding through relationship building; partner with someone who is already funded by DoD
- Mission driven – research must meet their needs
- Funding often BAA – Broad Agency Announcement
  - Engage in the meeting before the BAA is let
  - Provide input into BAA
  - Get to know their needs
- Present at meetings – attend smaller targeted conferences where DoD will attend
- Faculty Fellowships

Working with DoE

DoE – Department of Energy

- Funding through relationship building AND peer-review
- Mission driven – research must meet their needs
- Submission requirements extensive
- Faculty Fellowships

Some Other Funding Sources

- State Agencies
  - TCEQ, TGLO, THECB, TxDOT, TEA, TPWD
- Industry – all sizes of companies
- Foundations
  - Packard, Welch, Whittaker, Beckman
- Professional Societies
  - American Chemical Society, Water Environment Research Foundation
- Institutes
- Centers

Public v. Private Sources

Public Sponsors

- RFPs are typical
- Long response time (can be up to 6-9 months)
- Longer more detailed proposals
- Might require letter of intent
- More rules/regulations

Private Sponsors

- Might have RFPs, but might also accept unsolicited proposals
- Shorter response time
- Shorter proposals
- Might require letter of intent
- Fewer regulations

Funding Sources

- Know current state-of-the-art in your research area
- Know top ten national researchers in your area
  - What are they doing?
  - What do they consider the key issues?
  - Where do they get their money?
- Talk to other **faculty in your department** and area, see where they get funding.
- Know **faculty in other departments** across campus who might collaborate with you

Searching for funding opportunities

Pivot - http://pivot.cos.com/funding_main

pivot Texas A&M University-College Station

Instructions:
(1) Create account
(2) Edit/Populate Profile
(3) Create a Search – Funding Tab - View Tutorial for Advanced Search
(4) Save the Search – choose to receive updates
(5) Search for TAMU Collaborators – Profiles tab

Search for funding opportunities

Grants.gov - http://www.grants.gov

Instructions:
(1) Starting on “Home” tab, browse grants by newest, categories, agencies, or eligibilities OR
(2) Starting on “Search Grants” tab, search by keyword, agency, category, etc.
(3) Refine Search – options
(4) Select grant – summary, program solicitation, submission package
(5) Sign-up for change notification e-mails

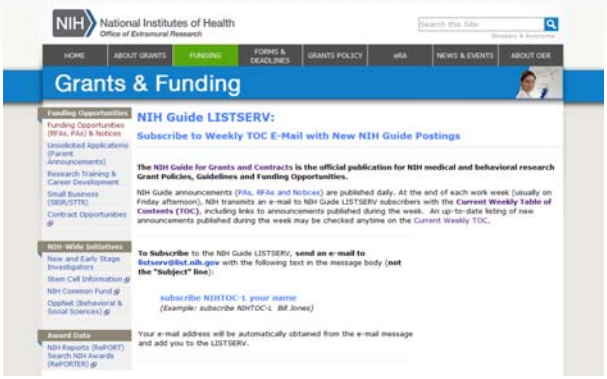
Sign-up for e-mail list-servs

Get on mailing lists for agencies related to your research - Ex. NSF http://www.nsf.gov/funding/

Sign up for e-mail list-servs

NIH

- Go to http://grants.nih.gov/grants/guide/listserv.htm. You will see instructions on how to subscribe and unsubscribe to the listserv.



The Agency

- Agency Mission
  - Look for web link to agency home page
- Agency Language
  - Read and cite the references they cite
  - Use their terminology
- Agency Program Officers
  - Contact them before submitting
  - Contact them to ask to be a reviewer

Requests for Proposal

Analyze the RFP

- Due dates – Letter of Intent (LOI), preliminary proposal, full proposal
- Eligibility and limits
  - PI
  - Institution
    - Limited submission – will have internal deadlines for selection to submit
- Budgetary Info – Amount of award
- Duration
- Number of Awards

Why contact an NSF program officer?

- See if your ideas are **a good fit** for the program
- **Introduce yourself** and your institution
- Develop **good rapport** with the program officer and establish credibility
- Help your proposal be more **competitive** by matching program needs and proposal writing requirements

Before contacting the program officer

- Prepare a brief research summary
  - About ¼ page
- Read the RFP or application guidelines
- Read recent abstracts and research program funding priorities
  - NSF: *http://www.nsf.gov/awardsearch/index.jsp*

First contact should be an e-mail,

then set up a conference call or visit

Questions to ask a program officer

- **FIRST**– be ready to listen
- Does idea **fit in the program** technical focus?
- What are **common shortcomings/problems** the program officer has seen in proposals?
- What is the **typical funding cycle** and/or the **typical project scope**? (For example CAREER minimum award is $400K, ask size of typical award, right at $400K or something more?)
- What are typical **program funding rates**?
- **Review process** – type of review, separate CAREER panel, who reviews, how can you volunteer to review
- **Specific RFP/program questions**

Questions NEVER to ask the program officer

- Do you like my idea?
- Will you fund my project?
- Is it a good research topic?
- Can you recommend a Co-PI?
- Will you review my proposal before submission?
- Will you serve on the advisory board?

Why Serve on an NSF Review Panel?

- Gain first-hand knowledge of the merit review process
- Learn about common problems with proposals
- Discover proposal writing strategies
- Meet colleagues and NSF Program Officers managing the programs related to your research

Junior Faculty Targeted Funding

Faculty Fellowships

- Use these opportunities to **develop relationships** within agencies to lead to future funding
- Bring along or **send your graduate students to** these labs to continue or develop relationships with national lab researchers
- Usually include stipend, moving/living expenses, and travel

Junior Faculty Targeted Funding

Faculty Fellowships

- Air Force Summer Faculty Fellowship Program
- Office of Naval Research Summer Faculty
- Research and Sabbatical Leave Program
- NASA Glenn Faculty Fellowship Program
- EPA/DoE Faculty Student Teams
- Oak Ridge Nat'l Lab – Higher Education Research Experiences

Junior Faculty Targeted Funding

Faculty Fellowships

- 10-12 weeks summer commitment
- $1300-1900+ weekly stipend
- US citizens only for many
- Security clearance required for some projects
- Travel and relocation allowance
- Due November – January for summer awards
- Students included for some programs

Junior Faculty Targeted Funding

Faculty Young Investigator Programs

- Fewer preliminary results
- Competing against early-career peers
- Sometimes higher funding rates
- Prestigious
- Leverage for other funding sources
- Not highest funding $

Junior Faculty Targeted Funding

Faculty Young Investigator Programs

Federal Programs

- NSF Faculty Early CAREER Program
- Air Force Office of Science Research Young Investigator Program
- Office Naval Research Young Investigator Program
- DARPA Young Faculty Award
- Department of Energy, Office of Science Early Career Research Program

Junior Faculty Targeted Funding

Faculty Young Investigator Programs

Federal Programs

- $80-$170K/ year - $360-750K total award size
- 2 – 5 year duration
- Some DoD YIPs have citizenship requirements

Junior Faculty Targeted Funding

Faculty Young Investigator Programs

Some smaller programs

- ACS Doctoral New Investigator Grants
- Texas Space Grants Consortium New Investigators Program
- NSF Computing Research Initiation Initiative (CRII)

Junior Faculty Targeted Funding

Faculty Young Investigator Programs

Some smaller programs

- $5K-$85K/ year - $10-$175K total award size
- often target the newest faculty within 3 years of 1st appointment at assistant professor
- 2 year duration
- Some have citizenship requirements
- Due throughout the year

Junior Faculty Targeted Funding

NSF Faculty Early Career Development Program (CAREER), http://www.nsf.gov/career

- Support "**teacher-scholars**" who propose creative, integrative, and effective research and education plans
- Support plans developed **within the context**, mission, goals, and resources of their organizations (in consultation with department head)
- Build a **firm foundation** for a lifetime of contributions to the integration of research and education (5, 10, 20 yrs)
- Foster the natural connections between **learning and discovery**

Junior Faculty Targeted Funding

NSF Faculty Early Career Development Program (CAREER), http://www.nsf.gov/career

Eligibility:

- Hold a doctorate
- Tenure-track position, untenured
- 3 tries

Due Date: July 2013

Award and Duration:

- $400K minimum ($500K for BIO and ENG)
- 5 years
- 500+ awards (10-25% success rate)

Junior Faculty Targeted Funding

NSF Faculty Early Career Development Program (CAREER), http://www.nsf.gov/career

Traits of a successful CAREER proposal:

- Match the expectations in the disciplinary programs in terms of research and education - This is a highly competitive program!
- Written with peer reviewers (Ad Hoc and/or Panel) in mind - Ask your Program Officer who will be assessing your proposal
- Appropriate scope of education and research activities.

Other NSF Funding

- Unsolicited – technical research within program
- EAGER – EArly concept Grants for Exploratory Research
  - up to $300K for up to 2 years
- RAPID – Rapid Response Research
  - up to $200K for 1 year
- MRI – Major Research Instrumentation

Proposal Logic

Proposal Logic:

There is an important problem…

- This problem is important because
  - Someone important said so (lit review)
  - The funding agency said so
  - Societal need

Proposal Logic:

I have a solution to the problem…

- Description of the solution (brief)
- Can be worded as research question or hypothesis
- Can be worded as goals and objectives

Proposal Logic:

My solution is better…

- Current solutions and their limitations (lit review)
- Preliminary results (yours)

Proposal Logic:

I believe my solution will work…

- Preliminary results (yours)
- Other people's work (lit review)

Proposal Logic:

How I will do the work…

- Bulk of proposal
- Details of research
  - Tasks
  - Timelines
  - Roles and responsibilities

Proposal Logic:

I can do the work…

- Credentials (in text, CV, Current & Pending)
- Preliminary results (if not discussed earlier)
- Facilities available
- Team members and their credentials
- Management plan for larger proposals

Proposal Logic:

Proof of solution…

- How you and others will know that you did what you promised
  - Evaluation
  - Deliverables

Proposal Logic:

Resources Needed

- Budget
- Budget Justification

Proposal Logic: *Summary*

- Objectives and Background
  - There is an important problem
  - I have a solution to the problem
  - My solution is better
  - I believe my solution will work
- Statement of Work
  - How I will do the work
  - Proof of solution – evaluation, deliverables
- Supplementary Data
  - I can do the work – CV, facilities, management plan
  - Resources needed – budget, budget justification

Timeline for Proposal Development

Time before deadline	Activity
>9 months	Preliminary Results Partnership Development
6-9 months	Initial Proposal Planning
3-6 months	Write Proposal
2 months	Get feedback; edit and proofread
1 month	Meet institutional deadlines
Deadline	Submit

Academic Writing versus Grant Writing

Academic Writing	Grant Writing
Scholarly Pursuit: *Individual passion*	**Sponsor goals**: *Service Attitude*
Past Oriented: *Work already done*	**Future Oriented**: *Work to be done*
Theme-centered: *Theory & thesis*	**Project-centered**: *Objectives & activities*
Expository rhetoric: *"Explaining" to reader*	**Persuasive rhetoric**: *"Selling" to reader*
Impersonal tone: *Objective, dispassionate*	**Personal tone**: *Conveys excitement*
Individualistic: *Primarily a solo activity*	**Team-focused**: *Feedback needed*
Few length constraints: *Verbosity rewarded*	**Strict length constraints**: *Brevity key*
Specialized terminology: *"Insider Jargon"*	**Accessible language**: *Easily understood*

Source: Porter (2007). ""Why Academics have a hard time writing good grant proposals", The Journal of Research Administration, 38(2), 37-43.

Proposal Writing: Top 5 Tips!

1. Do not make this sound like a journal paper – It is a SALES job

2. State up front WHAT will you do, research, apply
   - And WHY it is important or applicable

Proposal Writing: Top 5 Tips!

3. FOLLOW the RFP in detail
   - Did you put everything in they wanted?
   - Did you align with their mission and the RFP?
   - By reading your proposal, will the reviewers understand the problem you are proposing to solve?
   - Provide a GRAPHIC if at all possible

Proposal Writing: Top 5 Tips!

4. Is the Scope of Work realistic for project time-frame,
   - (i.e. Can you get results or what you promised by end of project?)
   - Also, does the text tie to the budget?

Proposal Writing: Top 5 Tips!

5. Have someone read if at all possible – EARLY of course
   - If you are off the mark, you have time to redo (not just edit)!

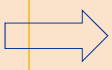
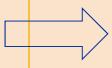
Take a Break Here?

Project Research Goal

Tips on Research Goal Statements

- This is the overall problem statement and purpose for your research
- Probably the hardest part to write, but if done well, it will easily guide the rest of your proposal
- Test: If you accomplish your goal, are you better off for the effort?
  - Compatible with your personal strategic plan
  - Compatible with your institution's goals
  - Contributes to society at large
- Format – specific, clear, and brief

Research Goal

Weak examples		Better Examples
This study will develop modeling and simulation-based technologies for building construction.		The research goal of this project is to account for uncertainty in engineering design decision making through the application of utility theory.
The goal of this project is to develop an integrated modeling tool for the hardening process.		The research goal of this proposal is to test the hypothesis that physical phenomena x,y,z govern chip formation in brittle materials.

Parts of a Proposal

NSF Proposal Template

- ✓ Cover Sheet (II.C.2.a)
- ✓ Project Summary (II.C.2.b)
- ✓ Project Description (II.C.2.d)
- ✓ References Cited (II.C.2.e)
- ✓ Biographical Sketch (II.C.2.f)
- ✓ Budget and Justification (II.C.2.g)
- ✓ Current and Pending Support (II.C.2.h)
- ✓ Facilities, Equipment, and Other Resources (II.C.2.i)
- ✓ Supplementary Documentation (II.C.2.j)
  - ✓ Collaboration Letters (as needed)
  - ✓ Data Management Plan
  - ✓ Post-Doctoral Mentoring Plan (if applicable)
- ✓ Single-Copy Documents (II.C.1.e)
  - ✓ Collaborators and other Affiliations

*See PAPPG, NSF 17-1, effective January 30, 2017

Proposal Writing

- Title
- Abstract/Summary
- Project Description/Narrative
- Management Plan
- Evaluation/Assessment
- Dissemination

Title of Proposal

- Some agencies specify length
- Be accurate and succinct
- Title is a label, not a sentence
- Catchy is okay, but not at the expense of clarity
- Strong First Impression
- Highlight the significant content of the proposal
- To make sure proposal is routed properly

Abstract/Summary

- Usually the first thing read by a reviewer, it may be the only part read if it is poorly written
- Economy of words essential
- Allow time to iterate many times

Often includes:

- Include statement of **objectives, methods, and approach**
- Describe **complete proposal** and expected **outcomes**

Project Description/Narrative

Typical Sections (15-page proposal):

- Introduction/Significance and Objectives (½ -1 pg)
- Background/Statement of Need/Literature Review (2 - 3 pages)
- Research Plan (6-10 pages)
- Management Plan (½ - 2 pages)
- Evaluation/Assessment (1 page)
- Dissemination (½ page)
- Summary (½ -1 page) (as needed)

Introduction

- Rationale for the proposed work
- Nature and scope of problem investigated
- State and justify the method of investigation
- **Goals and objectives** of project

- Define all terms here
- Do not withhold information

Background/Statement of Need

- Why should the agency fund?
  - Global or national needs
  - Local needs
- Literature Review
  - What is currently being done?
  - Where are the needs?
  - What are the missing pieces?
  - Why will your solution work?

Specifically explain the gap you will address, why it is important, how your research is vital to field

Research Plan

- Preliminary Results
  - Experience of proposer
  - Capacity of institution
  - Ability to conduct selected methodologies
- Step-by-step details – outline based on your goals and objectives

Research Plan (cont'd)

- Clarify your **goals and objectives** and provide a plan for how to accomplish them
  - Rationale
  - Methods/Activities (Tasks)
  - Expected Results/Deliverables
  - Limitations and alternatives

Management Plan

- For multiple PIs and Institutions
  - Needed if you have multiple collaborators
  - Who will make decisions?
  - Who is responsible for each objective?
  - Advisory/visiting committees
- **Timeline** of all project years and activities

Project Timeline

- Timeline for all activities associated with the project
- Start with well thought out objectives and detailed tasks.
- Based on a well-organized proposal
- Include start and end dates
- May have a prescribed format and content or not even required, but always a good idea. It's worth the space.

Timeline and Project Description

- 1.0 Significance and Objectives
  - State 3-5 numbered objectives here
    - 1. Objective 1
    - 2. Objective 2
    - 3. Objective 3
- 2.0 Background/Statement of Need
  - Provide background and reasoning to support your selection of goals and objectives
  - End this section with a restatement of your objectives
- 3.0 Research Plan

Timeline and Project Description

- 3.0 Research Plan
  - 3.1 Objective 1
    - Task 1
    - Task 2
  - 3.2 Objective 2
    - Task 1
    - Task 2
    - Task 3
  - 3.3 Objective 3
    - Task 1

- A well organized project outline will translate easily into a timeline.

- The objectives should be first stated on page 1 and the rest of the proposal organized based on these.

Example: Timeline Format

- Good format for overlapping activities

	Year 1				Year 2			
Tasks	1	2	3	4	1	2	3	4
Obj.1 , Task 1								
Obj. 1, Task 2								
Obj. 2, Task 1								
Obj. 2, Task 2								
Obj. 2, Task 3								
Obj. 3, Task 1								

Evaluation and Assessment

- Technical Research Evaluation
  - peer-reviewed publications
- Educational and Programmatic Evaluation
  - Internal
  - External
- Budget must reflect this

Dissemination

- Peer-reviewed journals
- Conferences
- Web-pages
- Education initiatives
- Student researchers
- Course modules
- Community Education

References

- Be complete, include state-of-the-art in your field
- Each entry must be complete
- Cite any references listed in the rfp
- Use a consistent style of citation

Biographical Sketch

- This will be reviewed, too! It must support your proposed research
- Shows your capacity to do the work
  - Publications/products should be carefully selected
- Follow formatting requirements
- Most federal funders accept NSF format
  - NIH format, very different from NSF

Current and Pending Support

- Experience with external funding
- Types/sources of external funding
- Prior commitments – are you over-committed?

Facilities

- This is where you show you have the infrastructure to do the work
- NSF section for this is called: Facilities, Equipment, and Other Resources

Data Management Plan

- Required because of previous research malpractice
- Types of data
- Storage of data (including compliance)
- Access to data
- Dissemination of results

Letters

- Maybe required, maybe disallowed
- Need to show commitment
  - Not just support
  - Not just restatement of the project
- Can indicate how proposed project aligns with institutional priorities

Budget

Exercise: Budget Categories

What are the various budget categories that you might expect on a research proposal?

If you had the money, how would you spend it?

Salaries/Wages

- Actual salaries for named individuals
  - PI
  - Co-PI
  - Sr. Personnel
- Salary/wages
  - Research Associates
  - Administrative support staff
  - Graduate Students (graduate, undergrad) – recruitment tool
- Fringe benefits
  - Currently for TAMU: 17.5% of faculty/staff salaries (3.8% for students)
  - plus group insurance
- Annual escalation : 3%

Other costs to consider

- Equipment
  - >$5K
  - Fabricated equipment
- Travel – be as specific as you can
  - to conferences – name the organization, location
  - collaborations
  - visit sponsor
  - data collection
- Subcontracts/Professional Services/Consultant

Other costs to consider

- Conference Fees/Registration
  - Notice this is separate from travel
- Materials and supplies
  - Equipment use costs
- Publications/Copying

Facilities and Administrative Costs

- Costs that cannot be directly assigned to a specific project:
  - Utilities
  - Building depreciation
  - Lab space
- What is the applicable rate for TAMU?
  - Currently 48.5% (of MTDC)

Cost Sharing

- Policy – only offer cost sharing if guidelines require it
- Cost sharing is specifically prohibited on most NSF proposals

Budget and Justification

- This may be the first part a reviewer reads
- Your chance to explain why your project needs each dollar requested
- Justification of the budget must match the research plan presented
- Should match the budget tables exactly (order/amounts)

Review Process and Criteria

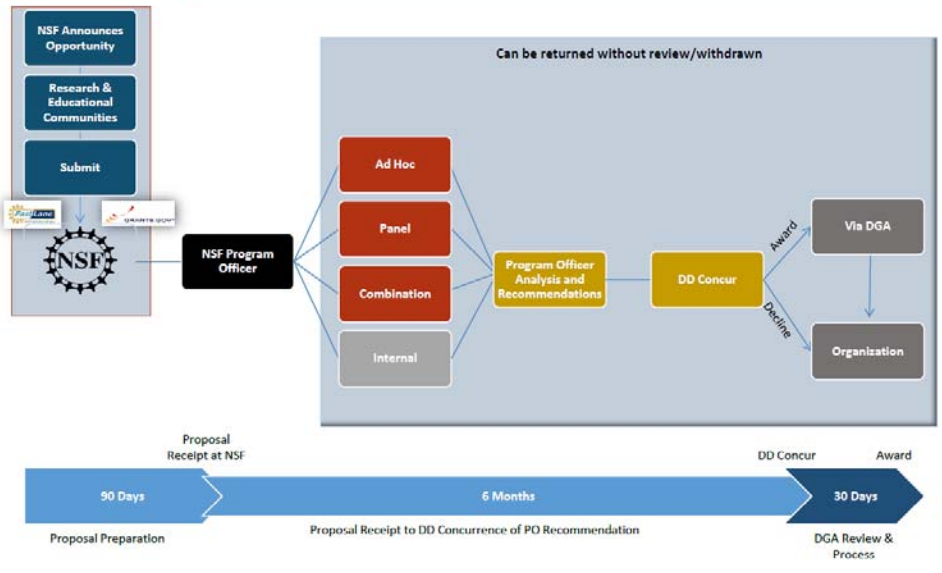
Review Process

- Review Criteria are published
- Review
  - panel or mail-in
  - ad hoc or standing
- Reviewers
  - Experts – in your specific area
  - Technically literate – expertise in related area
- Present as to a technically literate person not necessarily in your research niche, especially the summary and intro

The Proposal Review Process

- How will your proposal be evaluated?
- Who will evaluate it?
- What feedback will you receive?

NSF Proposal & Award Process Timeline



Steps in Review Process

- Received by funder
- Assignment to a program (or cluster)
- Administrative Review
  - Checked for compliance
    - Both review criteria addressed
    - Formatting
    - Appropriateness of study to RFP

Follow instructions to prevent Return Without Review!!!!!

Steps in Review Process

- Scientific Review (panel, ad hoc)
- Agency (funder) Review
- Decisions
  - Award or decline recommendation by Program Officer
    - Portfolio balance
  - Concurrence by Division Director
  - Award notifications by Division of Grants and Agreements

Review Process

- NSF - Ad hoc / Panel
  - 6-8 members
  - new panel for each competition, but may be some repeat members
- NIH - Longer-term Panel
  - 25-30 members
  - each serve 3-4 years
- DoE, ONR - Program Officer

Put Yourself in the Reviewer's Place

For NSF

- Each panel reviewer is assigned 10-12 proposals
  - Typically have high level of technical expertise in over half of these proposal areas
  - May be competent generalists familiar with technical issues (but not actively publishing) in some of the proposal areas
- Expect reviewers (3-4) of your proposals to have both levels of expertise.

Types of Feedback

- Individual, verbatim reviews from individual reviewers
- Panel Summary
  - Summarizes discussion among panelists
  - May contradict individual reviews
  - Summarizes key strengths and weaknesses
- Comments from program officer who attended review
- General comments about the entire submission from lead program officer

Additional Feedback

- Discussion with program officer
  - Can provide insights into how to interpret the reviews
  - Can help you decide how to proceed with resubmission
  - Need to have specific questions planned to ask

Opportunities to Get Involved in Review Process

- Become an *ad hoc* reviewer
- Become a panelist
- Become a rotating program officer

What if you don't get funded?

- If not funded -- try again
- Get copies of reviewers comments
  - Specific items to address in a rewrite
  - Contact the program officer
- Maybe submit to another agency or program if comments indicate a mismatch

Access to Workshop Materials

Electronic versions of today's PowerPoint presentation and handouts are available at:

- http://teesresearch.tamu.edu/proposal-tips/
- Will be available through 5/19/17, after that contact me directly at lsgarton@tamu.edu

Questions?