

So You Want to Write an NSF Grant Proposal



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Content provided by Henry Neeman - OU



**INFORMATION
TECHNOLOGY**
THE UNIVERSITY OF OKLAHOMA



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- And then from Henry Neeman to us.



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Objectives

- Gain a working knowledge of the grant proposal process at the National Science Foundation.
- Have a clearer idea of what you hope to accomplish when writing an NSF grant proposal.
- Identify common elements for grant proposals.



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The NSF Proposal Process

1. You write and submit proposal via NSF's Fastlane or grants.gov.
2. Proposal review process initiated
 - Proposals tallied by program director by category.
 - Panel dates set.
 - Reviewers selected.
 - Review criteria are furnished.
 - Assignments made to reviewers.
 - Reviewers submit reviews.
3. Review panel(s) assembled.



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About the Reviewers

- The reviewers may be subject matter experts in an area relevant to your proposal -- or they may not be.
- You're writing your review for the review panel.
 - But you have no idea who they are: not when you're writing, nor when you find out the NSF's decision, nor ever after.
 - The panel has zero authority -- they recommend, not decide.
- More panel members than actual readers of each proposal.
 - Each panel member reviews multiple proposals, and each proposal has multiple reviewers, but usually no one reviews all of the proposals that the panel gets.
- You get to suggest reviewers in your proposal -- but the NSF program officer isn't bound by your suggestions.
- Become a reviewer! It's the best way to learn how they think.



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Funny Stuff

Stuff **Academics Say** @AcademicsSay Following

Reviewer 2 walks into a bar complaining loudly of it being the worst library ever.

RETWEETS 363 LIKES 459

1:02 PM - 8 Feb 2016

Stuff **Academics Say** @AcademicsSay Following

Reviewer 2 walks into a bar that's not the one they would have built.

RETWEETS 337 LIKES 388

Stuff **Academics Say** March 22 · 🌐

Reviewer 2 walks into a bar complaining immediately of this not being the joke they would have written.

Like Comment Share



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The Proposal Process (cont'd)

- Panel recommendation made to the program officer.
 - “Highly Competitive,” “Competitive,” “Non-competitive”
- Program officer reviews recommendations from all panels.
 - There may be multiple panels for the same program.
- If the program officer selects your proposal to be funded, that doesn't mean you've won yet.
 - You may be contacted to respond to panel concerns, in which case you'll be expected to prove that you've got those concerns addressed.
 - The program officer makes the final decision for funding -- but they've got to be able to justify the heck out of their decision to their boss, and so on up the chain of command.
- Always make the program officer's job easy



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The Proposal Process (cont'd)

1. Preliminary (non-binding) decision by program officer.
2. You probably will be asked to submit follow-up materials.
 - At least an abstract to be publicly posted after the official decision has been announced
 - Confidentially, because no official decision has been made.
3. Official decision publicly announced.



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Before you begin, remember

- Sometimes you win, some times you lose.
- “You cannot close what you don’t propose.”
- Great proposals often don’t get funded.
 - Sometimes they have too many great proposals to fund.
 - Sometimes your reviewers misunderstand your proposal.
 - That’s your fault.
 - Which means, you can do better on the resubmit -- which means this is something you have a good deal of control over.
 - Resubmits are much more likely to get funded than the first time.
- Lousy proposals rarely get funded.
- It often takes more than one try to get funded (law of large numbers)..



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Probability of Success

- National Science Foundation, FY2015: 24% overall
 - BIO 27%, CISE 23%, EHR 20%, ENG 20%, GEO 25%, MPS 28%, SBE 24%
 - EPSCoR jurisdictions: Northern Marianas Islands 0% (no PhD-granting), ND 12%, AL/PR 15%, AR/ID 16%, KY/MS/NV 17%, OK/SD 18%, NE/NM/SC/VT 19%, AK/MO/WV 20%, IA/WY 21%, LA 22%, DE/HI/KS 23%, MT 24%, ME/NH 26%, Guam/USVI 33%, RI 36%
 - Non-EPSCoR jurisdictions: FL 20%, TN/TX 21%, AZ/OH/VA 22%, UT 23%, CT/IN/NJ/NC 24%, CO/GA/MI/NY 25%, MD/PA/WI 26%, CA/MA/OR 27%, IL/MN 28%, WA 30%, DC 37%
- Funding is governed by the Law of Large Numbers: You have to submit lots of proposals to get any funding.

<http://dellweb.bfa.nsf.gov/awdfr3/default.asp>



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Proposal Components

- Cover Page
- Project Summary
- Project Description
- References
- Budget
- Budget Justification
- Biographical sketches
- Current and Pending Support
- Conflict of Interest List
- Facilities and Equipment
- Data Management Plan
- Postdoc Mentoring Plan
- Supplementary Documentation (varies by program)



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Note

- Each piece of the proposal is another opportunity to make your case.
- Think in terms of using each section to enhance your argument.



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Pointers

- Read the solicitation.
- Ask the program officer about any questions you might have.
- Read the solicitation.
- Pay attention to
 - Section II: Program Description
 - Program-wide Criteria
 - Program Areas
 - Section V A: Proposal Preparation Instructions
 - Full Proposals
 - Program Areas
 - Section VI A: Review Criteria
 - There are Solicitation Specific Review Criteria



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Pointers (cont.)

- Read the solicitation.
- Aim to make a compelling argument.
- Be satisfied with a competent argument.
- Demonstrate that you know what you don't know – and what you are going to learn...
- And who you will be contributing to greater knowledge and/or improving the state of the art.



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What Are You Trying to Achieve?

- Give reviewers reasons to recommend your proposal for funding.
- Never give the reviewers an excuse to say no.
 - If they're going to say no, at least they should have to earn it.
- Consider what the reviewer will think after reading your proposal:
 - “I see where they're going with this.”
 - “They really know their stuff.”
 - “I didn't know they had all that going on over there!”
 - “Wow! This will mean a lot to that campus.”
 - “They have their act together. (I wish we communicated as well on my campus.)”
 - “This is a GREAT investment!”
- Everything in your proposal should support this.



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Proposal Beginning

- Cover Page
 - Title
 - PIs/Co-PIs
- Project Summary
 - One Page
 - Brief project description -- executive summary
 - Intellectual Merit statement
 - Broader Impacts statement
 - Make it easy for the reviewers and program officer to be able to tell what you plan to do, why it'll work, and how it'll help.



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Project Description

- 15 pages long (usually)
- Introduction/Vision
 - This is a good place to quote from a major national report that says that the kind of work you're planning is very important.
- Project Objectives (typically 3 or 4)
- Intellectual Merit
- Implementation Plan
- Broader Impacts
- Management Plan
- Evaluating Progress



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Broader Impacts

- Advancement of scientific knowledge
- Activities that contribute to achievement of societally relevant outcomes
- Full participation of women, persons with disabilities, and underrepresented minorities in STEM
- Improved STEM education and educator development at any level
- Increased public scientific literacy and public engagement with science and technology
- Improved well-being of individuals in society
- Development of a diverse, globally competitive STEM workforce
- Increased partnerships between academia, industry, and others
- Improved national security
- Increased economic competitiveness of the US
- Enhanced infrastructure for research and education
- Your broader impacts are judged on what you've already done.



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Results from Prior NSF Support

- Every NSF proposal has to have a section on “Results from Prior NSF Support.”
- If your team has lots of that, you can’t fit it all. The solicitation and the NSF’s Grant Proposal Guide provide useful guidelines on that.
 - The PI and each Co-PI should each provide the one most relevant grant.
 - Each should include explicit sections on Intellectual Merit, Broader Impacts and a list of publications (or “No publications were produced under this award.”).
- If you don’t have anything relevant, say that.
- If you do, is there a way that you can fit this proposal into a more coherent story?



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Management Plan

- Who will do what?
- Decision making: Describe the procedure.
- Advisory committee(s)
 - External: one CI, one researcher, one broader impacts.
 - You can also have an Internal Advisory Committee.
- Timeline and milestones
- Sustainability plan: What happens when the grant ends?



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Budget

- People: Start with salary, then add in fringe benefits and Indirect Costs (also known as Facilities & Administration).
 - For professionals, typically the “fully loaded” amount roughly doubles the salary amount.
- Things
 - Permanent equipment over \$5000: not subject to IDC
 - Other: subject to full IDC
- Subcontracts: The first \$25,000 of each subcontract may be subject to IDC by both the lead institution and the subcontracting institution.
 - You can do a Collaborative proposal, which waives that.
 - Submitting a collaborative proposal is painful.
 - The lead institution has zero control over the other institutions’ budgets.



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Budget (cont'd)

- Participant support: not subject to IDC
 - Travel, subsistence, stipends etc for participants in workshops and similar events.



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Cost Share

Cost Share

- Either mandatory or forbidden
- Can only be done at exactly the level required.
- There is **NO SUCH THING** as voluntary cost share: if they don't ask for it, you can't include it.
 - Your proposal can be returned without review.
- Typically has to be items that could otherwise be funded on the grant budget.
- Typically has to be paid from non-federal funds.



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Institutional Commitment

- Not the same as cost share.
- Not required nor prohibited.
- Strange rules:
 - **CANNOT** mention any dollar figures (or anything that can be straightforwardly translated into dollar figures).
 - **MUST** appear in the Facilities, Equipment and Other Resources section, because it's an "other resource" (preference for at the end).
 - **SHOULD** be confirmed in a letter of collaboration from someone who has the authority to commit.
 - **MAY** appear in the project description.
 - **MAY** be (and usually is) contingent on getting grant.



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Everything Else

- Budget & Budget Justification
 - Many institutions provide a template
- Data Management Plan (dmptool.org)
- Letters of Commitment/Collaboration
 - Some solicitations put restrictions on these, others don't.
 - Letters of support (“This is a swell project”) are FORBIDDEN unless explicit allowed by the solicitation.
- Biographical Sketches (PI, Co-PIs, Senior Personnel)
- Current & Pending Support (PI, Co-PIs, Sr Personnel)
 - You may not have any.
 - You **MUST** list this proposal.
- Conflict of Interest List (PI, Co-PIs, Sr Personnel) -- NEW!



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OK Supercomputing Symposium 2016



2003 Keynote:
Peter Freeman
NSF
Comp & Info Sci & Engr
Assistant Director



2004 Keynote:
Sangtae Kim
NSF Shared
Cyberinfrastructure
Division Director



2005 Keynote:
Walt Brooks
NASA Advanced
Supercomputing
Division Director



2006 Keynote:
Dan Atkins
Head of NSF's
Office of
Cyberinfrastructure



2007 Keynote:
Jay Boisseau
Director
Texas Advanced
Computing Center
U. Texas Austin



2008 Keynote:
José Munoz
Deputy Office Dir
Sr Sci Advisor
NSF Office of
Cyberinfrastructure



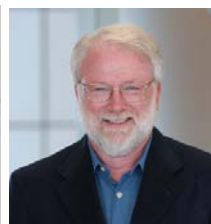
2009 Keynote:
Douglass Post
Chief Scientist
US Dept of Defense
HPC Modernization
Program



2010 Keynote
Horst Simon
Deputy Director
Lawrence Berkeley
Nat'l Laboratory



2011 Keynote
Barry Schneider
Program Manager
National Science
Foundation



2012 Keynote
Thom Dunning
Director
National Center for
Supercomputing
Applications



2013 Keynote:
John Shalf
Dept Head CS
Lawrence
Berkeley Nat'l Lab
CTO, NERSC



2014 Keynote:
Irene Qualters
Division Dir
Advanced
Cyberinfrastructure
Division, NSF



2015 Keynote:
Jim Kurose
Asst Director
Comp & Info Sci &
Engr Directorate,
NSF



2016 Keynote:
Dan Stanzione
Exec Director
Texas Advanced
Computing Center
U. Texas Austin

FREE!
Wed Sep 21 2016
@ OU

Reception/Poster Session
Tue Sep 20 2015 @ OU
Symposium
Wed Sep 21 2015 @ OU



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Thanks for your
attention!



Questions?

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