The NSF Grant Writing Workshop

2017 Summer Writing Institute Part I

July 25, 2017

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The research grant application process.

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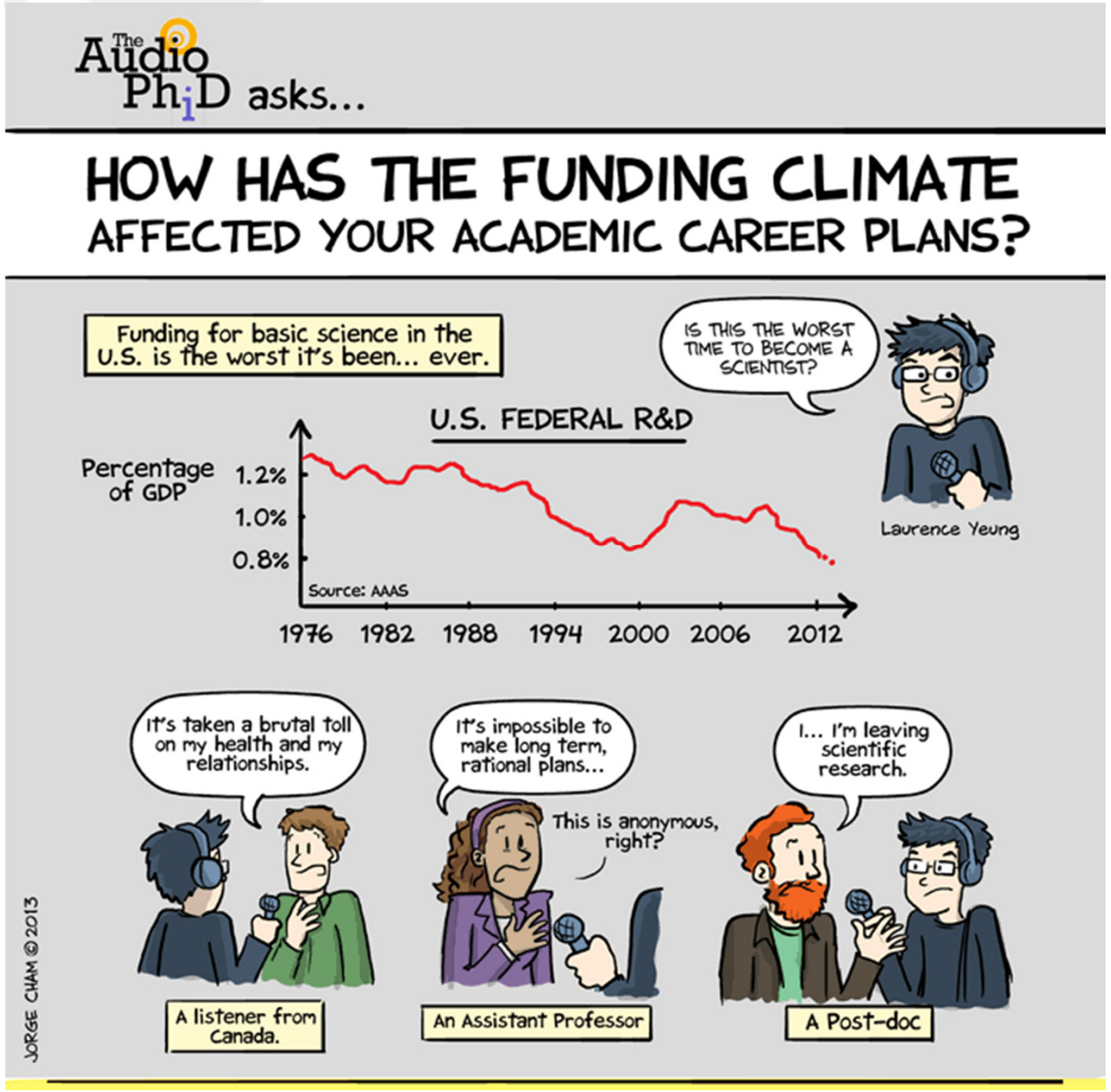

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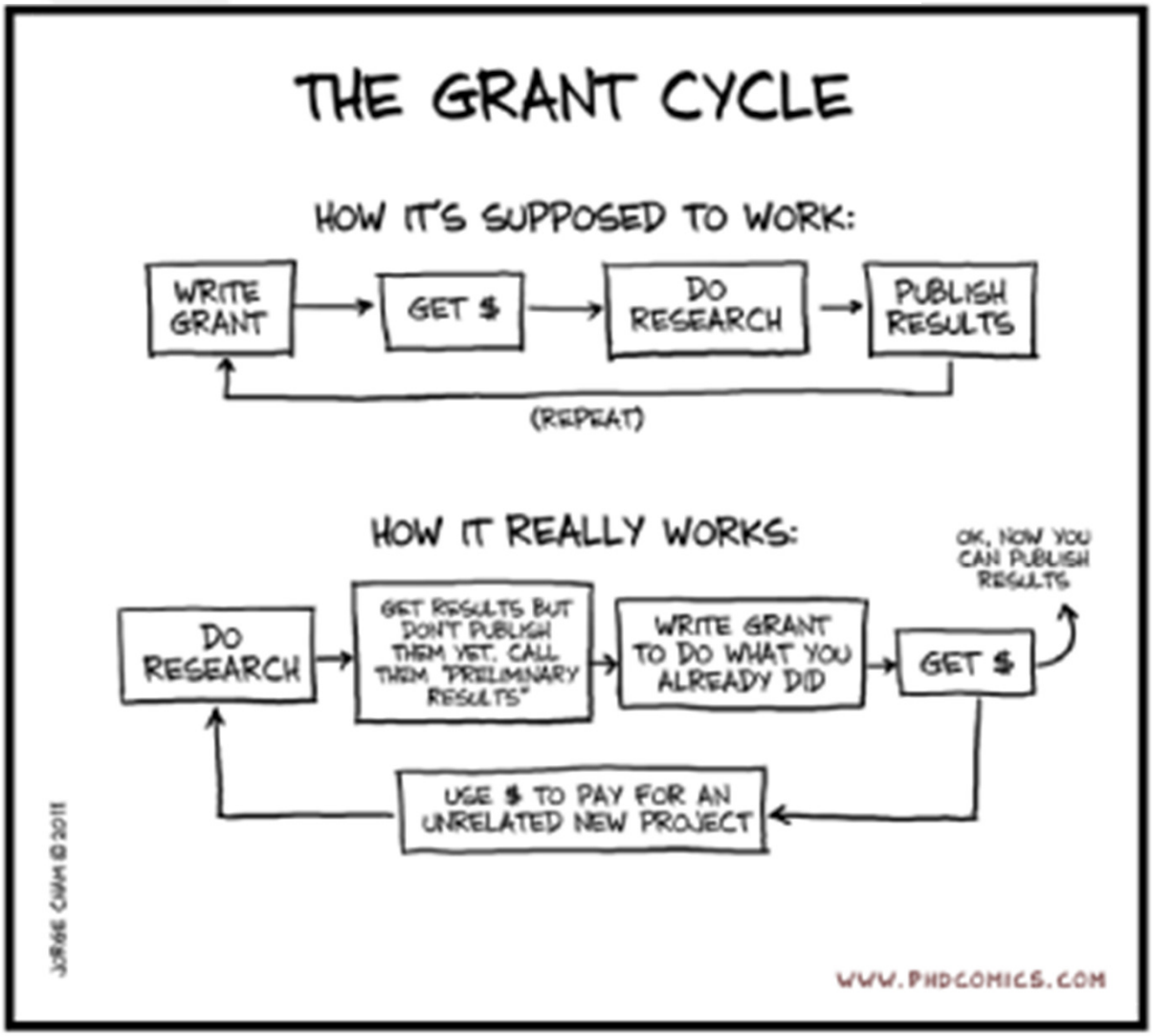

"Piled Higher and Deeper" by Jorge Cham
www.phdcomics.com

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Granting Funding Opportunities: Funding Sources

• Most research funding comes from two major sources.

- Corporations (R& D Departments)
- Government (Universities and Specialized Government Agencies)

• Some small amount of scientific research are funded by charitable foundations especially in relation to developing cures for diseases

- American Cancer Society
- American Asthma Foundation

Differences between Corporation (Private-Sector) or Government-funded research.

- Profit
- Knowledge.

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NSF Overview

•An independent Federal agency established by the National Science Foundation Act of 1950

• The Act states the purpose of the NSF is "to promote the progress of science; [and] to advance the national health, prosperity, and welfare by supporting research and education in all fields of science and engineering"

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NSF Organizational Structure

- Discipline-based Directorates (7)
  - Biological Sciences (BIO)
  - Computer & Info Sciences & Engineering (CISE)
  - Education & Health Resources (EHR)
  - Engineering (ENG)
  - Geoscience (GEO)
  - Mathematical & Physical Sciences (MPS)
  - Social, Behavioral & Economic Sciences (SBE)

- Division within each Directorates
- Sections
- Programs within Sections
- Program Directors (permanent & IPAs also known as “rotators”)

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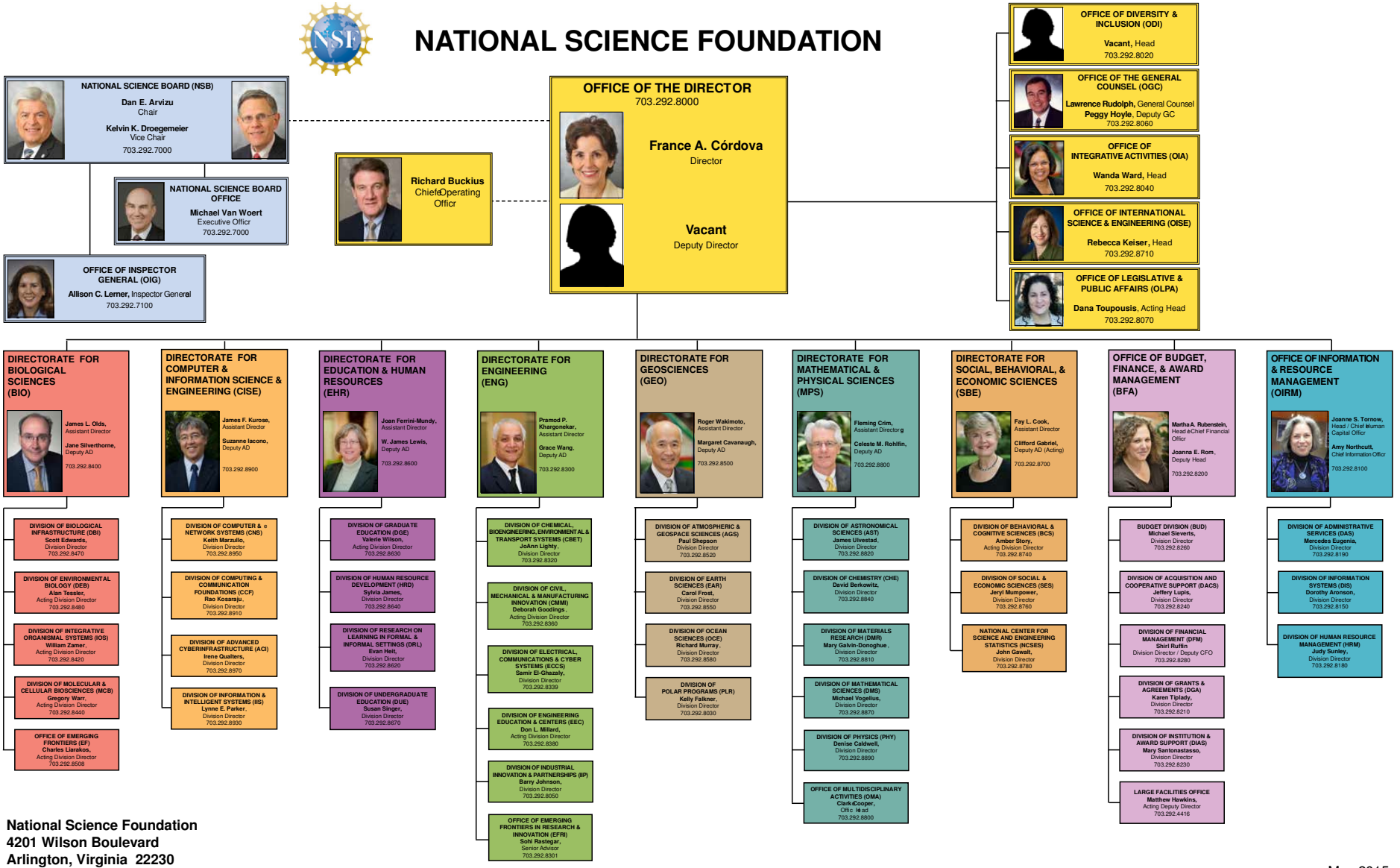

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May 2015

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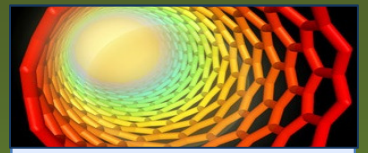
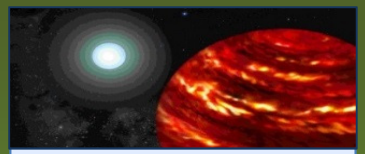
NSF Champions Research and Education Across All Fields of Science and Engineering

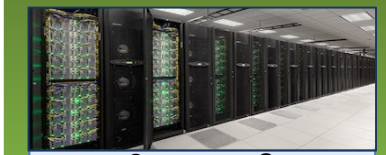
Biological Sciences



Engineering



Mathematical & Physical Sciences



Computer & Information Science & Engineering

Geosciences

Integrative Activities

Education & Human Resources

Social, Behavioral & Economic Sciences

International Science and Engineering

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Type of NSF Proposals

- Unsolicited proposals (most $$)
- Program Solicitations/Announcements (PA's)
- Cross-Directorate Programs (CAREER, EFRI)
- *EArly-concept Grant for Exploratory Research(High Risk-High Reward ; EAGER; < $300,000 for 2yrs; Invite only)
- *Rapid Response Research (RAPID; <$200,000 for 2yrs)
- Integrated NSF Support Promoting Interdisciplinary Research and Education (High risk/high-reward interdisciplinary; INSPIRE: max award and size of 1, 000,000 for max duration of 5 yrs; must be co-funded by two or more intellectually distinct NSF divisions or programs)
- Supplements (including REU, RET)
- Research Centers (ERC, MRSEC, STC)

* Internal Merit review required

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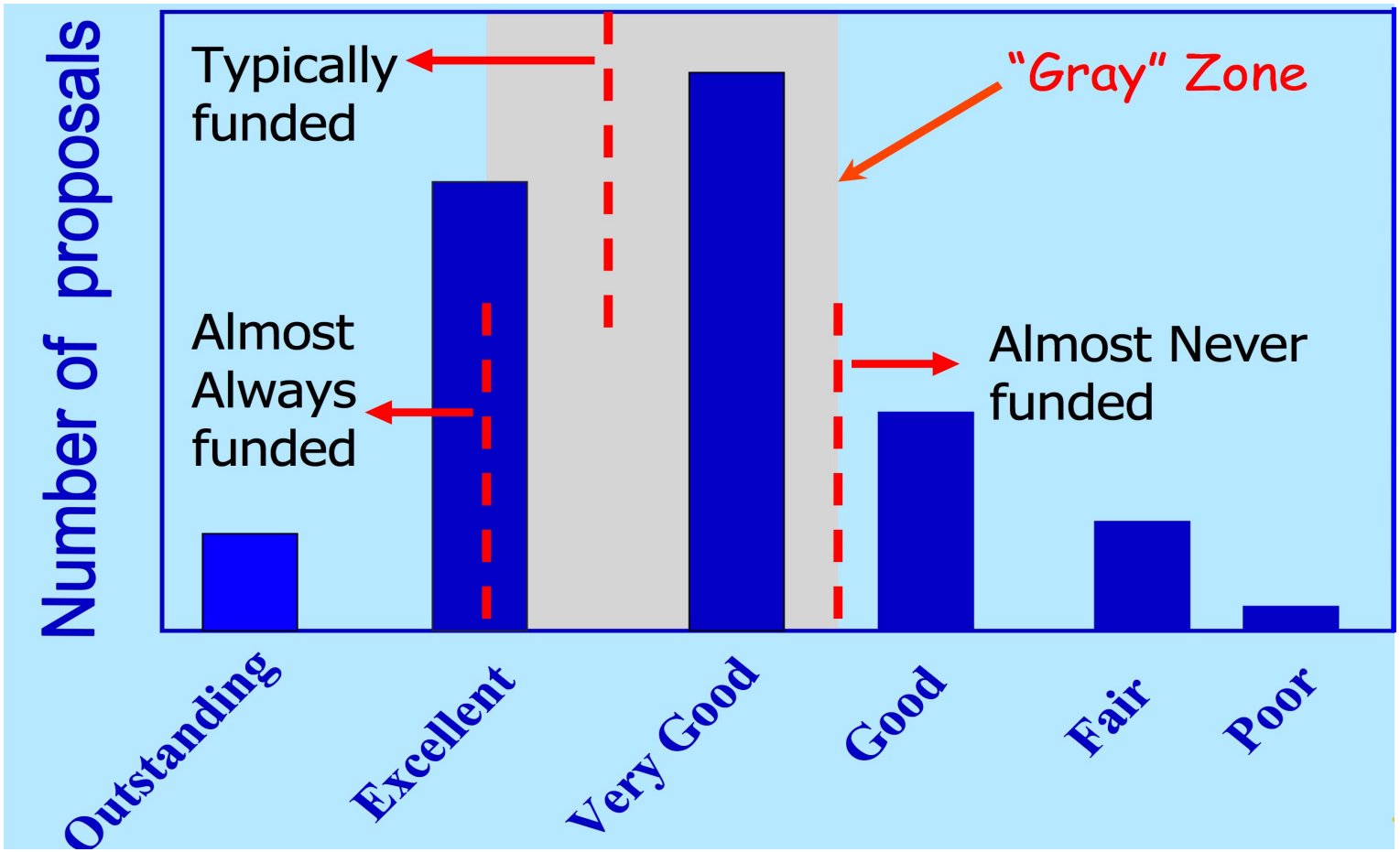
Who Gets Funded?



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Common Reasons for High Ratings

• "This proposal suggests a clear, elegant, well-documented approach to a problem that has plagued this field for decades."

• "The PI has a beautiful plan. Undergraduates or new graduate students can step right into this work, yet it solves a major problem and will be publishable in a first-rate journal."

• " This is certainly adventurous, and I frankly would have doubted it could be done. Yet the PI has proven the method in preliminary *AND* had it accepted by a peer-reviewed journal!"

• "This reads like a dream. I have rarely seen a proposal, even from long-established investigators, that shows such careful thoughts and meticulous presentation."

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Common Reasons for Low Ratings

• No well defined hypotheses or tests of same: Lack of focus: “Why all the rambling, this seems like a fishing expedition.”

• Extraneous aspects or PIs: “ What does the components/Co-PI have to do with the central focus of the proposal.”

• Important information on experimental and sampling procedures is omitted: “I really can’t tell what is going to be done and how.”(aka “Trust me” syndrome)

• Unrealistic work plan and or budget: Scope of the work out of proportion to the budget and length of time required.

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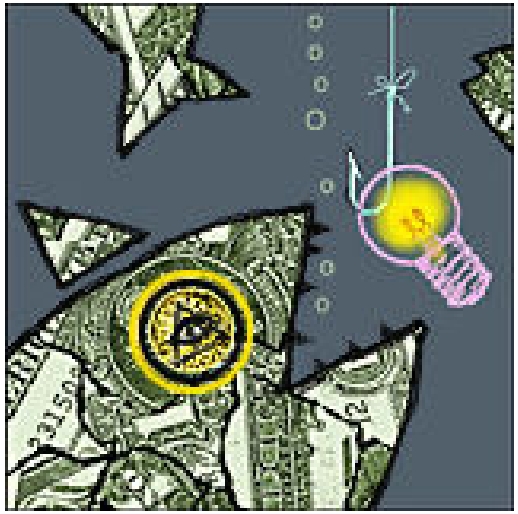
What Makes a Proposal Competitive?

- Significance (Important area of research)
- Original approach “Wow Factor”
- Strong likelihood of success, i.e., will make a significant contribution to the field
- Knowledge and experience in the discipline
- Experience in essential methodology
- Succinct, logical and focused project plan
- Realistic amount of work
- Sufficient detail
- Cost effective



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General NSF Review Criteria

- What is the intellectual merit of the proposed activity?
  - Strength of science

- What are the broader impacts of the proposed activity?
  - What's your education plan?
  - How would it attract women or under representative groups?
  - What is the benefit of society?

- Program specific criteria may be listed in the program announcement

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Intellectual Merit- 5 strands

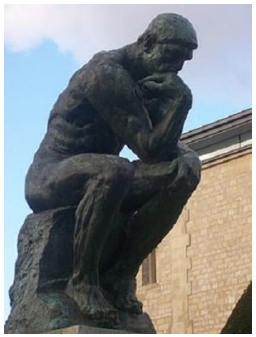
1) How important is the proposed activity to advancing knowledge and understanding within its own field or across different fields?

2) How well qualified is the proposer to conduct the project?

3) To what extent does the proposed activity explore creative, original, or POTENTIALLY TRANSFORMATIVE CONCEPTS*

4) How well conceived and organized is the proposed activity?

5) Is there sufficient access to necessary resources?



*"potentially transformative" is a relatively new emphasis (Sept 2007) www.nsf/gpv/pubs/2007/in130.jsp

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Broader Impacts-5 strands

1) How well does the activity advance discovery and understanding while promoting teaching, training and learning?

2) How well does the proposed activity broaden the participation of women and underrepresented groups? ("Diversity")

3) To what extent will it enhance the infrastructure for research and education, such as facilities, instrumentation, networks and partnerships?

4) Will the results be disseminated broadly to enhance scientific and technological understanding?

5) What may be the benefits of the proposed activity to society?

http://www.nsf.gov/pubs/gpg/boarderimpacts.pdf

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Areas of Impact

• Social Impact: Improved quality of life, safety, security, poverty and decreased marginalization, and racism

• Environmental Impact: Improved quality of air, water, land, soil, species and ecosystem including energy, food, climate changes and environmental policy development

• Economic Impact: Increased employment, jobs, exports, and economic poly development including increased private sector investment

• Health Impact (NIH): Reduction of disease incidence rates, mortality rates, improved clinical outcomes and treatment.

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WARNING!

NSF Means It!

Re: "Intellectual merit" and "broader impacts"

"(Pis) must address **both** merit review criteria in **separate statements** within the one-page **Project Summary**. This chapter also reiterates the broader impacts resulting from the proposed project **must be addressed in the Project Description and described as an integral part of the narrative**."

Effective October 1, 2002, NSF will **return without review** proposals that do not **separately address both merit criteria within the Project Summary.**

Grant Proposal Guide, Ch. III

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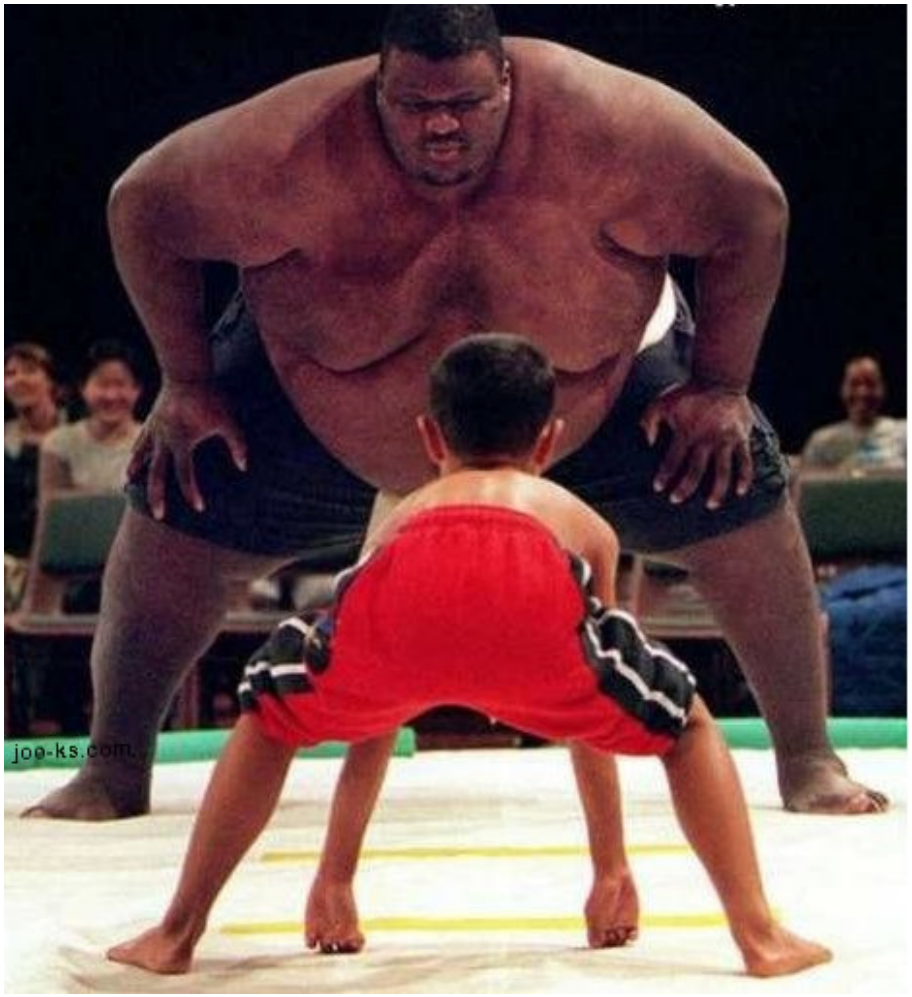
Do you feel like you have the David and Goliath Syndrome went it comes to Grant Writing?



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Planning Your Proposal

- Start Early!!! (3-6 months before deadline)
- Study Program Announcements (PA) and goals
- Search NSF Awards to see what related projects have been funded; carve out YOUR niche
- List some ideas that excite you; test them with colleagues (form your own review panel!)

- Read successful grants; identify potential mentors
- Sharpen the focus of your strongest idea(s)
- Contact key NSF Program Directors; test idea(s) for “fit”

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Key NSF Web Pages

- www.nsf.gov/funding/ Funding opportunities by Directorate, with an alphabetical index of grant programs

- www.nsf.gov/funding/pgm_list.jsp?org=NSF&ord=ren Active funding opportunities, recently announced. Often reflect current NSF priorites

- www.nsf.gov/funding Grant Proposal Guide "The Bible" Detail instruction on writing and submitting your proposal

- www.nsf.gov/funding/preparing/faq/index.jsp?org=NSF FAQ's on the Grant Proposal Guide

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Writing Your Proposal

- Project Summary (1 page)
- Project Description (15 pages)
- Reference Cited
- Biographical sketches (1 page)
- Budget
- Facilities, Equipments & Other Resources
- Appendix (only if authorized)

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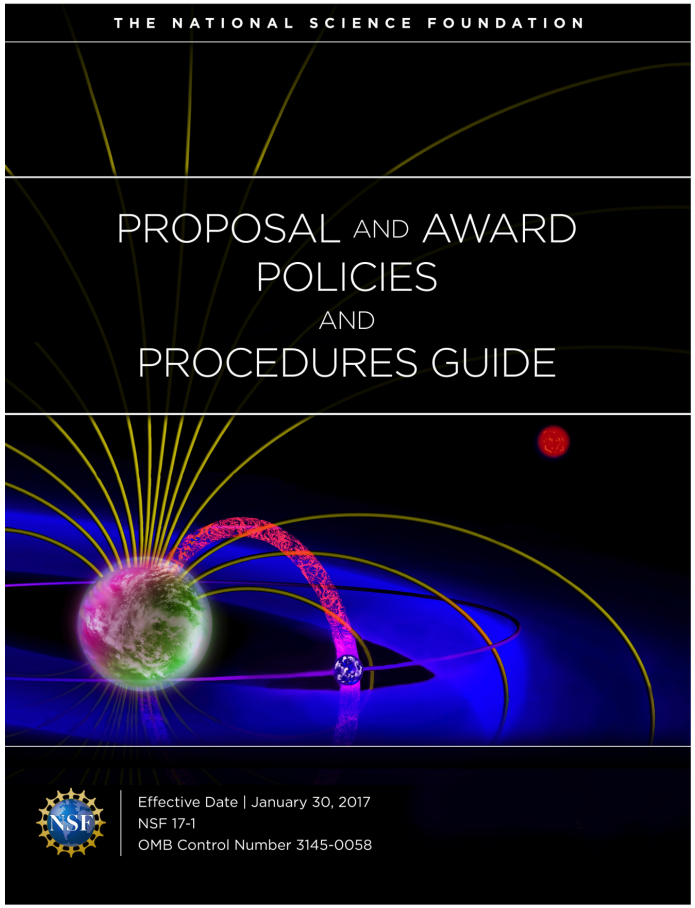
NSF Grant Proposal Guideline (GPG): The Source of All Truth and Wisdom…



Any question regarding policy…

call (703) 292-8243 or
email to policy@nsf.gov

Note: These are commandments, not suggestions!

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Proposal Structure

Project Summary (1 page)

- A self-contained "thumbnail sketch" of the project
- Should stress significance and innovation
- Summarize project overall goal(s) objectives
- List methods to be employed
- Identify expected outcomes
- Address separately, with headlines:
  1) Intellectual Merit
  2) Broader Impact

Project Summary

Next-Generation Servers for Optimization as an Internet Resource

Large-scale optimization has been a subject of investigation for over 50 years, but the challenge of making it useful in practice has continued to the present day. Initially the greatest dif culties were posed by solution *computation* and model *representation,* but the primary impediment to broader use of optimization models and methods today is one of *communication.* Increasing numbers of optimization "solvers" are implemented increasingly well, but prospective users are unaware of them or do not see the potential bene t that would justify obtaining and installing them. Modeling systems tend to be slow to support new solvers, moreover, especially ones that address new problem types.

The ability to send optimization problems over the Internet, for submission to a solver at some remote site, is now providing an increasingly practical way of addressing communication problems in large-scale optimization. A remote optimization "server" can accommodate numerous problem types and can provide varied solvers for problems of each type, giving modelers much more of a choice than they could hope to have locally. Previous work under the auspices of the Optimization Technology Center of Northwestern University and Argonne National Laboratory studied and experimented with the concept of an optimization server through the creation of the NEOS Server, which makes nearly 50 solvers available through a broad variety of network interfaces. Still, the current NEOS Server only begins to address the communication dif culties of large-scale optimization with respect to solver choice, scheduling, benchmarking, and connection to modeling languages. Because the Server has evolved along with the Web and the Internet, moreover, it is limited to some degree by early design decisions.

Intellectual merit. The planned research is motivated by a vision of a next-generation NEOS Server that addresses outstanding challenges of communication in large-scale optimization. This work will address design as well as implementation issues posed by standardizing problem representations, automating problem analysis and solver choice, working with new web-service standards, scheduling computational resources, benchmarking solvers, and veri cation of results — all in the context of the special requirements of large-scale computational optimization.

Research in these areas is timely, being motivated by new standards for web services and by the recent success of the NEOS Server itself, and will build on the considerable expertise in optimization servers already available at the Optimization Technology Center.

Broader impact. The NEOS project has been a major activity of the Optimization Technology Center since the Center's founding in 1994. Its continuing goal is to make optimization a part of the worldwide software infrastructure that supports science and commerce. To this end, the NEOS Guide (`www.mcs.anl.gov/otc/Guide`) includes online examples of optimization problems, listings of test problem collections, and surveys of publications and software. The complementary NEOS Server (`www-neos.mcs.anl.gov`) provides remote access to solvers and hence is the focus of the proposed research.

The ready availability of optimization tools has widespread bene ts, both directly to practitioners, and indirectly by improving the quality of research and education in optimization techniques. Excerpts of comments from a wide variety of users testify to the NEOS Server's value in helping potential users of all kinds. The Server's variety of solvers and interfaces also tend to ensure that it is addressing a broad base of needs.

http://users.iems.northwestern.edu/~4er/NEOSprop.pdf

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Tips for the Project Summary

1) Strive to be COMPLETE though BRIEF

2) View it as a one page advertisement

3) Write it last after you've completed the entire proposal

4) DO NOT merely cut and paste from the first page of the project description

5) Keep in mind purposes other than the reviewer:
   - Condensed into abstract if awarded
   - Request from top management at NSF

Remember: This maybe the only section that some reviewers will read! Make it brief "stand alone" statement of the scope, methods and significance of your project

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Proposal Structure,cont'd

Project Description (15 pages)

- Detailed description of the project's overall purpose, specific objective and expected significance
- Relation to longer-term goals of researcher(s)
- Contribution to present state of knowledge
- Results from prior NSF support, if any (5pp.max)
- Clear description of experimental methods and procedures
- Detailed work plan, with major tasks and timelines
- Address broader impacts of project
- Plans for dissemination of outcomes

Project Description

Next-Generation Servers for Optimization as an Internet Resource

Large-scale optimization has been a subject of investigation for over 50 years, but the challenge of making it useful in practice has continued to the present day. Initially the primary dif culties were posed by *computation,* but breathtaking increases in computer power and algorithm sophistication combined to allow for routine solution of large problems arising in practical applications [3]. As computational needs were addressed, the more serious dif culties came to be posed by *representation,* as modelers found that they could solve larger problems than they could manage or understand [15, p. 169]. This challenge, too, was eventually met, by increasingly sophisticated modeling languages and systems for describing and working with optimization problems [12, 26].

The primary dif culty of large-scale optimization has now shifted again, to one of *communication.* Increasing numbers of optimization algorithms are implemented increasingly well, but prospective users are unaware of these "solvers" or do not see the potential bene t that would justify obtaining and installing them. Only certain combinations of solvers and modeling systems work with each other, moreover, and modeling language support is slow to keep up with solver extensions to new problem types.

The Internet is now providing an increasingly practical way of addressing communication problems in large-scale optimization [19]. Websites offer abundant solver information [16], to be sure, but the more signi cant advance is the ability to send optimization problems over the Internet for submission to a solver at some remote site. The remote optimization "server" can address numerous problem types and can provide varied solvers for problems of each type, giving modelers much more of a choice than they could hope to have locally. In previous work under the auspices of the Optimization Technology Center of Northwestern University and Argonne National Laboratory, we have studied and experimented with the concept of an optimization server through the creation of the NEOS Server [6, 9, 24], which makes nearly 50 solvers available via a broad variety of network interfaces.

The current NEOS Server only begins to address the communication dif culties of large-scale optimization, however. The Server cannot tell users which solvers are appropriate for a problem that has been submitted, or choose a solver host based on the expected resource needs of a problem. Connections from modeling languages to solvers are still incomplete, and support for benchmarking is limited. Because NEOS has evolved along with the Web and the Internet — its rst interface, through e-mail, dates back to 1996 — it is limited to some degree by early design decisions.

The research that we propose is thus motivated by our vision of a next-generation NEOS Server that addresses outstanding challenges of communication in large-scale optimization. This work will address design as well as implementation issues posed by standardizing problem representations, automating problem analysis and solver choice, working with new web-service standards, scheduling computational resources, benchmarking solvers, and veri cation of results — all in the context of the special requirements of large-scale computational optimization. Our research in these areas is timely, being motivated by new standards for web services and by the recent success of the NEOS Server itself, and will build on the considerable expertise in optimization servers already in place at the Optimization Technology Center.

The remainder of this introduction addresses the *broader impact* of the Optimization Technology Center, the NEOS project, and speci cally the NEOS Server. The four major

http://users.iems.northwestern.edu/~4er/NEOSprop.pdf

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Tips for the Project Description

1) Be persuasive; cite authoritative sources to prove the importance of the research problem

2) Cite enough relevant research to show familiarity with state of the art scholarship

3) Establish credibility of your approach by citing relevant preliminary data and published work

4) Provide detailed description of the educational activities integrated into the project

5) Show how your work will advance the field

Remember: Pictures do more than words: Use charts, illustrations and graphs to help reviewers "see" exactly how the project will unfold

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Formulate Precise Goals and Objectives

Goals: General statement of the project's overall purpose(s)

" Our long term goal is to reveal the dynamics of heat transport within nanostructures and across interfaces of dissimilar materials at the nanoscale levels."

Objective: A specific, measurable outcome, benchmark or milepost on the way toward the goal

1. " Measure the precise thermal conductivity of DNA molecules using laser pulses."

2. "Quantify the thermal properties of interfaces between nanoscale thin fils and liquids metals using transient thermoreflectance."

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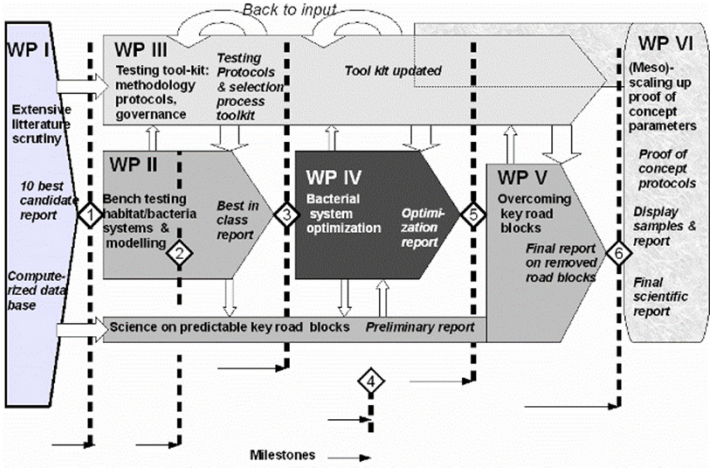
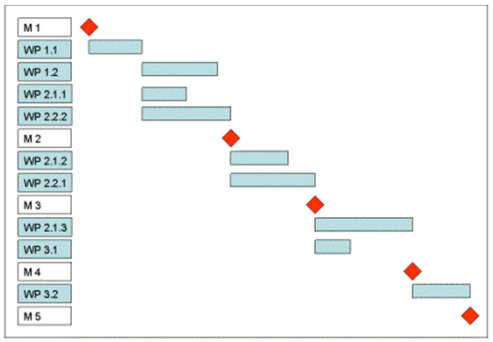
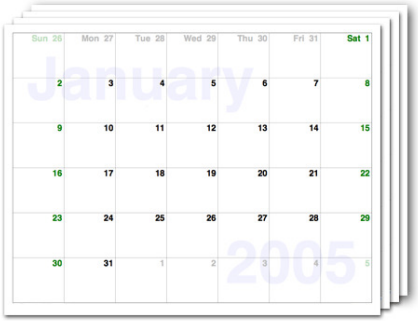
Use Graphic Illustrations

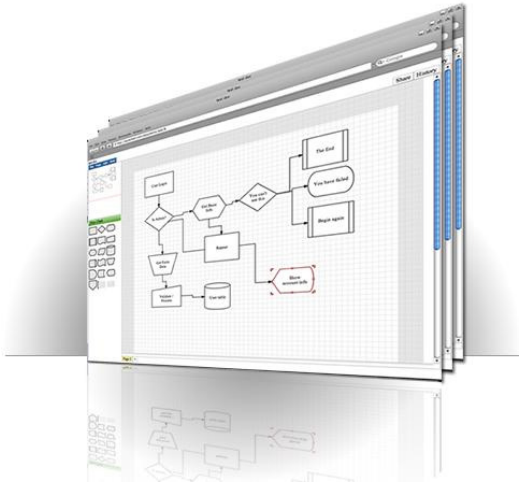
1) Visualize the overall project with a drawing



2) Specifiy major tasks and timelines; use Gantt charts, calendars or flow charts







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Proposal Structure, cont'd

References Cited

- This section is required
- Include: Author(s), article and journal title, vol #, page numbers, year of publication
- If available electronically, include url
- Follow an accepted scholarly format
- Do NOT include commentary parenthetical to narrative!
- No page limit

References Cited

[1] J.R. Birge, M.A.H. Dempster, H.I. Gassmann, E.A. Gunn, A.J. King and S.W. Wallace, A Standard Input Format for Multiperiod Stochastic Linear Programs. COAL Newsletter **17** (1987) 1–19.

[2] J.J. Bisschop and A. Meeraus, On the Development of a General Algebraic Modeling System in a Strategic Planning Environment. Mathematical Programming Study **20** (1982) 1–29.

[3] R.E. Bixby, Solving Real-World Linear Programs: A Decade and More of Progress. Operations Research **50** (2002) 3–15.

[4] A. Brooke, D. Kendrick and A. Meeraus, GAMS: A User's Guide, Release 2.25. Scienti c Press/Duxbury Press (1992). See also www.gams.com.

[5] J.W. Chinneck, Analyzing Mathematical Programs Using MProbe. Annals of Operations Research **104** (2001) 33–48.

[6] J. Czyzyk, M.P. Mesnier and J.J. Moré, The NEOS Server. IEEE Journal on Computational Science and Engineering **5** (1998) 68–75.

[7] E.D. Dolan, NEOS Server 4.0 Administrative Guide. Technical Memorandum ANL/MCS-TM-250, Argonne National Laboratory, Argonne, IL (2001).

[8] E.D. Dolan, R. Fourer, J.-P. Goux and T.S. Munson, "Kestrel: An Interface from Modeling Systems to the NEOS Server." Technical report, Mathematics and Computer Science Division, Argonne National Laboratory (September 2002).

[9] E.D. Dolan, R. Fourer, J.J. Moré and T.S. Munson, "Optimization on the NEOS Server." SIAM News **35,** 6 (2002) 4, 8–9.

[10] E.D. Dolan and J.J. Moré, Benchmarking Optimization Software with Performance Pro les. Mathematical Programming **91** (2002) 201–213.

[11] E.D. Dolan, J.J. Moré and T.S. Munson, Measures of Optimality for Constrained Optimization. Technical report, Mathematics and Computer Science Division, Argonne National Laboratory (April 2002).

[12] B. Dominguez-Ballesteros, G. Mitra, C. Lucas and N.-S. Koutsoukis, Modelling and Solving Environments for Mathematical Programming (MP): A Status Review and New Directions. Journal of the Operational Research Society **53** (2002) 1072–1092.

[13] M.C. Ferris, M. Mesnier and J.J. Moré, NEOS and Condor: Solving Optimization Problems over the Internet. ACM Transactions on Mathematical Software **26** (2000) 1–18.

[14] I. Foster and C. Kesselman, eds., The Grid: Blueprint for a New Computing Infrastructure. Morgan Kaufmann (1999).

[15] R. Fourer, Modeling Languages Versus Matrix Generators for Linear Programming. ACM Transactions on Mathematical Software **9** (1983) 143–183.

[16] R. Fourer, Optimization Frequently Asked Questions. Optimization Technology Center of Northwestern University and Argonne National Laboratory, www-unix.mcs.anl.gov/otc/Guide/faq/ (2003).

[17] R. Fourer, D.M. Gay and B.W. Kernighan, A Modeling Language for Mathematical Programming. Management Science **36** (1990) 519–554.

[18] R. Fourer, D.M. Gay and B.W. Kernighan, AMPL: A Modeling Language for Mathematical Programming, 2nd edition. Duxbury Press, Paci c Grove, CA (2002). See also www.ampl.com.

[19] R. Fourer and J.-P. Goux, "Optimization as an Internet Resource." Interfaces **31,** 2 (2001) 130–150.

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Proposal Structure, cont'd

Biographical Sketch(es) (2 pages)

- Required for Senior Personnel (PI's co-PI's and Faculty Associates)
- Two page limit, NSF format required
  - Professional preparation
  - Appointments
  - Publications
  - Synergistic activities
    - Updates-
  - Collaborators and other affiliations are no longer required as part of the BioSketch
- Optional: Other personnel w/exceptional qualifications may be listed (Post docs, GRA's etc

Template for NSF biosketch
Vlad L. Jones

a. Professional Preparation.

Institution	Major	Degree	Year
University of California, Irvine,CA	Physics	B.S.	1978
Harvard University, Cambridge, MA	Physics	M.A.	1980
California Institute of Technology	Physics	Ph.D.	1984

b. Appointments.

1992-present	Professor, Department of Physics, Tufts University, Medford, MA
1997-1999	Visiting Scientist, Department of Molecular Physics, MIT, Cambridge, MA
1989-1995	Research Associate, Pennsylvania State University, PN
1987-1992	Associate Professor, Department of Physics, Tufts University, Medford, MA
1985-1987	Assistant Professor, Department of Physics, Tufts University, Medford, MA
1984-1985	Research Fellow, Laboratory of Molecular Biophysics, Department of Crystallography, Birkbeck College, London

c. Publications.

FIVE PUBLICATIONS MOST CLOSELY RELATED

[1] Jones, VL, Walker, LM. Description of a particle with arbitrary mass and spin, Nuclear Physics, 2005 29, 61.
[2] Lindemayer, JC, Jones, VL. Photopion p-wave multipoles near threshold from 12C(gamma, pi 0) and 1H(gamma, pi 0). Phys Rev C Nucl Phys. 2004 50: 2979-2994.
[3] Jones VL, Chao MK, Yoshimoto M, Murasaki S. Photopion production in 3H and 3He. Phys Rev C Nucl Phys. 2003 49:1927-1939.
[4] Jones, VL, Cosner D, Bernholdt C, Wright LE. Photopion cross sections and mass 14 structures.Phys Rev C Nucl Phys. 2003 ;45:230-232.
[5] Lindemayer, JC, Jones VL. 0(+)-0(+) transition in charged photopion reactions. Phys Rev C Nucl Phys. 2002 Jun;43:2742-2746.

FIVE FURTHER PUBLICATIONS

[1] Jones, VL, Schneider, PR. Wave equations for particles with high spin. Phys. Rev. 2004 62: 41.
[2] Basile, TC, Jones VL, Lindemayer, JC, Schneider, PR. Temperature-dependent orbital degree of freedom of a bilayer manganite by magnetic compton scattering. Phys Rev Lett. 2004 Nov 12;93(20):207206
[3] Jones, VL, Schneider, PR, Kent, TK. Symmetric spinor theory for any spin. Phys. Rev. 2003 60:107.
[4] Thames, DL, Jones VL. Spin correlations in the photoproduction of vector mesons, Phys. Rev. 2003 60: 59.
[5] Cosner D, Jones, VL, Wright LE. Vector boson elastic scattering and Compton scattering. Int. J. Theor. Phys. 18, 25.

d. Synergistic activities.

1. For many years I have been the advisor (including doctoral advisor) to graduate students and Physics majors and have served on the graduate committee and the university Educational Policy Committee as well as the Programs and Policy Committee of the Graduate School of Arts and Sciences. I serve on the Neubauer Faculty Advisory Board, an assembly of faculty who advise a group of students who have been given merit based research support upon

http://grantwriting.tufts.edu/?pid=15

National Science Foundation
WHERE DISCOVERIES BEGIN

Proposal Structure, cont'd

Budget

- Must be supplied for each year of project duration
- Justification required for all major items (3 page limit)
- Must match project design and work plan EXACTLY!
- Faculty salaries included for summer work only (some exceptions)
- Details on budget structure, allowable costs, etc., may be found in the GPG, Sections II-10 thru 11-17

Remember: The budget should be exactly what the project requires, no more, no less. Deliberate padding or "lowballing" is quickly spotted.

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Proposal Structure, cont'd

Facilities, Equipment & Other Resources

- Used to assess the adequacy of the organizational resources available to complete the project successfully
- Must describe only those resources that are directly applicable

Special Info & Supplementary Documentation

- Included if needed for special circumstances (Performing part of project off campus or in foreign countries)
- Posdoc Mentoring Plan (if applicable) filed here
- Not to be used as an appendix

Appendix

- May be included only if a deviation from guidelines has been requested and authorized by NSF!

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Surefire proposal killers

1) Exceed page limits

2) Fonts too small, margin too narrow

3) Graphic illustrations hard to read

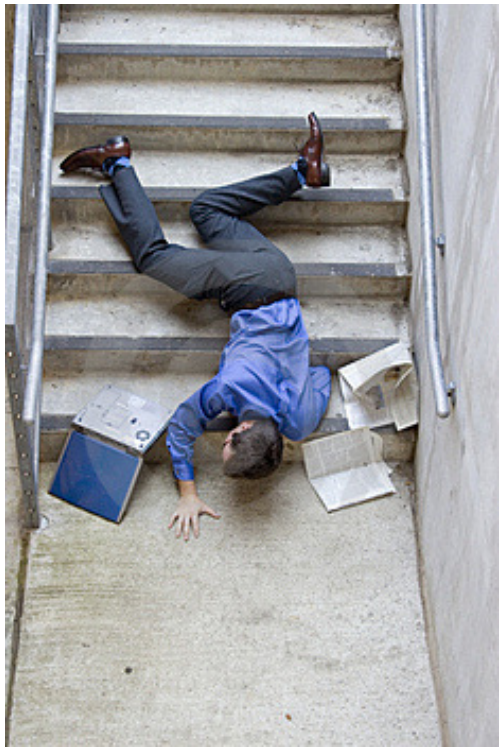
4) Supplementing the project narrative with urls or commentary in the “References” section

5) Lack of knowledge about current scholarships

6) Insufficient detail or overly broad promises in “ broader impacts” and “diversity” sections

7) Discrepancies between work plan and budget

8) Using “trust me” language instead of providing project details



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WHERE DISCOVERIES BEGIN

Challenges for Researcher: Future NSF Evolution

January 21, 2011, The National Science Board announced it is undertaking a thorough review of the NSF merit review criteria in response to the 2010 American COMPETES Reauthorization Act:

SEC 526. BORDER IMPACTS REVIEW CRITERION

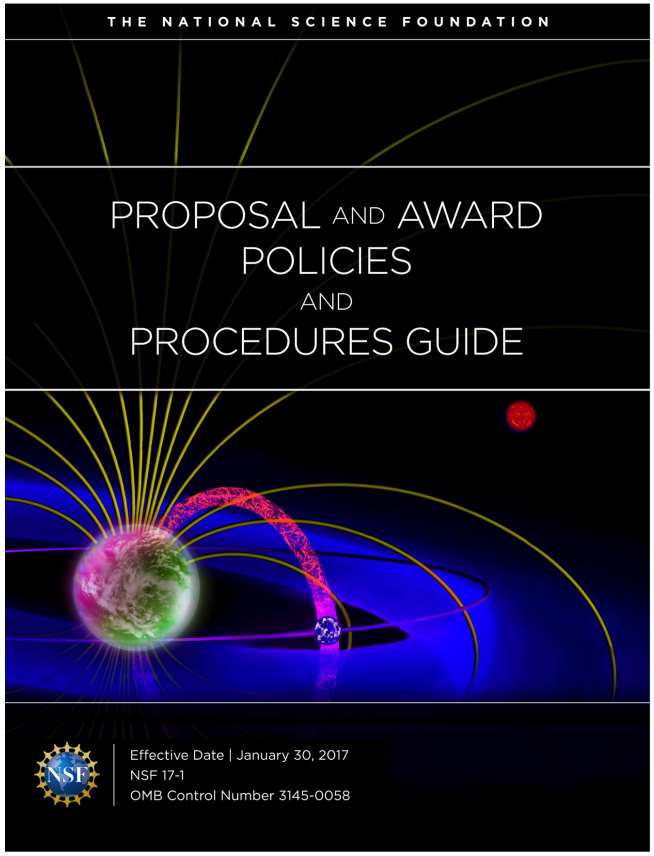
(1)Increased economic competitiveness of the United States
(2) Development of a globally competitive STEM workforce
(3) Increased participation of women and underrepresented minorities in STEM
(4) Increased partnerships between academia and industry
(5) Improved pre-K-12 STEM education and teacher development
(6) Improved undergraduate STEM education
(7) Increased public scientific literacy
(8) Increased national security

National Science Foundation
WHERE DISCOVERIES BEGIN

Changes in NSF Policies

New PAPPG released
October 25 2016

Effective January 30, 2017



- Proposal & Award Policies & Procedures Guide
  - 9 months review and comment beginning in April 2016
  - Effective date, January 30, 2017
  - Significant Changes and Clarifications to the PAPPG:

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Some of the notable changes

5:00:00

- 5 p.m. submitter's local time is standard for all submissions, including proposals submitted in response to solicitations

5:00:01

National Science Foundation
WHERE DISCOVERIES BEGIN

Some of the notable changes

Use of “should” and “must”

- The use of “should” and “must” have been revised throughout the PAPPG.
  - Should is voluntary, must means MUST.
- If the word “must” (rather than “should”) has been used, please note that this is a *requirement*. Proposals that do not have required elements may be returned without review. This includes use of special characters, formatting, and organization of documents uploaded separately as well as collaboration plans, data management plans, and other elements required by solicitation or the Grant Proposal Guide.

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Some of the notable changes

- Broader impacts. "**The Project Description must contain, as a separate section within the narrative, a section labeled "Broader Impacts"**. GPG II.C.2.d(i)
- Pay attention to changes in:
  - Results from Prior NSF Support
  - Biographical Sketches
  - Current and Pending Support
- Public Access requirement will apply to peer-reviewed journal articles and juried conference papers resulting from awards made from proposals submitted after January 2016.
  - NSF Public Access Repository (NSF-PAR), par.nsf.gov
  - Voluntary deposit to NSF-PAR is possible.

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WHERE DISCOVERIES BEGIN

Some of the notable changes

NSF Public Access: Project Reporting

- Reduce burden on PIs by automatically ingesting publication information submitted through NSF-PAR into annual and final project reports
- Cumulative listing of all products
- Simplify reporting of products
- Automatic ingest will only happen for awards that must comply with the new Public Access policy
- NSF has worked with a small group of PIs to voluntarily deposit publications in NSF PAR to test the automatic ingest process

Automated Compliance Checking

AUTOMATED PROPOSAL COMPLIANCE CHECKS PERFORMED BY SYSTEM AS OF JULY 24TH, 2015.*											
COMPLIANCE CHECK	FUNDING OPPORTUNITY TYPE	ERROR / WARNING	FUNDING MECHANISM TYPE								
			RESEARCH	RAPID	EAGER	IDEAS LAB	CONFERENCE	EQUIPMENT	INTERNATIONAL TRAVEL	FACILITY/ CENTER	FELLOWSHIP
Proposal Section Exists Checks											
1. Project Summary is required.	GPG Program Description Program Announcement	ERROR	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Program Solicitation	ERROR	✓	✓	✓	✓	✓	✓	✓	✓	✓
2. Project Description is required.	GPG Program Description Program Announcement	ERROR	✓	✓	✓	✓	✓	✓	✓		
	Program Solicitation	ERROR	✓	✓	✓	✓	✓	✓	✓	✓	✓
3. References Cited is required.	GPG Program Description Program Announcement	ERROR	✓	✓	✓	✓	N/A	✓	N/A		
	Program Solicitation	WARNING	✓	✓	✓	✓	N/A	✓	N/A	✓	✓
4. Biographical Sketch(es) is required.	GPG Program Description Program Announcement	ERROR	✓	✓	✓	✓	N/A	✓	N/A		
	Program Solicitation	WARNING	✓	✓	✓	✓	N/A	✓	N/A	✓	✓
5. Primary Budget is required.	GPG Program Description Program Announcement	ERROR	✓	✓	✓	✓	✓	✓	✓		
	Program Solicitation	ERROR	✓	✓	✓	✓	✓	✓	✓	✓	✓
6. Budget Justification for the Primary Organization is required.	GPG Program Description Program Announcement	ERROR	✓	✓	✓	✓	✓	✓	✓		
	Program Solicitation	WARNING	✓	✓	✓	✓	✓	✓	✓	✓	✓
7. Budget Justification for each Subrecipient Organization that exists is required.	GPG Program Description Program Announcement	ERROR	✓	✓	✓	✓	✓	✓	✓		
	Program Solicitation	WARNING	✓	✓	✓	✓	✓	✓	✓	✓	✓

http://www.nsf.gov/bfa/dias/policy/autocheck/compliancechecks_july15.pdf

Key Documents

- Proposal & Award Policies & Procedures Guide
  https://www.nsf.gov/pubs/policydocs/pappg17_1/nsf17_1.pdf
  Fiscal Year 2016 Budget Request
  https://www.nsf.gov/about/budget/fy2017/
  NSF Strategic Plan for Fiscal Years 2014-2018
  nsf.gov/publications/pub_summ.jsp?ods_key=nsf14043
- NSB Report on Merit Review
  nsf.gov/nsb/publications/pub_summ.jsp?ods_key=nsb1333
- Public Access
  - Plan (NSF 15-52)
    www.nsf.gov/news/special_reports/public_access/index.jsp
  - Research.gov (www.research.gov), About Public Access
- ACI website, www.nsf.gov/div/index.jsp?div=ACI

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Support in Proposal Preparation

- Talk to NSF Program Officers
- Serve as reviewer and panelist
- Review funded proposals
- Seek mentors on campus
- Use your Sponsored Research Office

<u>NSF Publications</u>

✓Program Announcement

✓ Grant Proposal Guide

✓ Web pages

✓Funded Project Abstracts

✓ Reports, Special Publications

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Electronic Submission Required

FastLane
www.fastlane.nsf.gov

OR

GRANTS.GOV℠
www.Grants.gov

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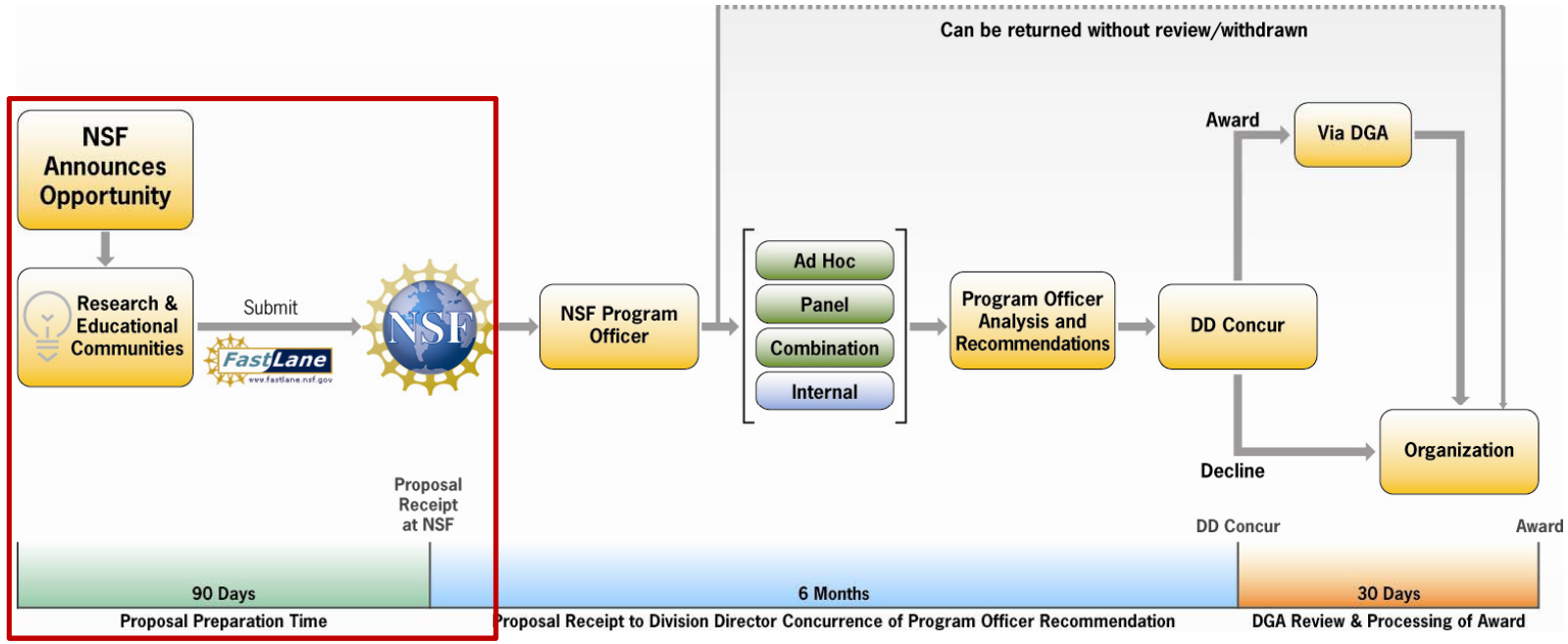
NSF Proposal & Award Process Timeline



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Three Most Important Rules

1) Don't wait until the last minute to submit!

2) Don't wait until the last minute to submit!

3) Don't wait until the last minute to submit!

❖

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Email: dallengi@health.usf.edu
Tele: (813) 974-7225

Questions?...

Contacting Grant Program Officers

The NSF Grant Writing Workshop
2016 Summer Writing Institute Part II
July25, 2017

Diane S. Allen-Gipson, Ph.D.
University of South Florida Health
College of Pharmacy and Pharmaceutical Sciences
Tampa, FL

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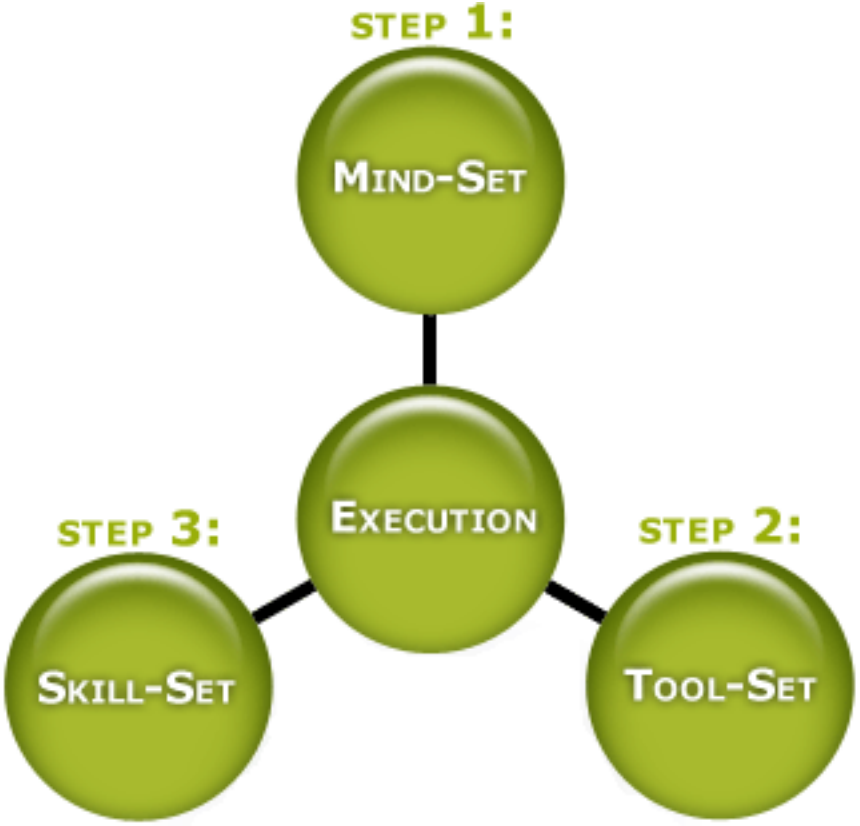
Developing the Right Skill Sets for Success



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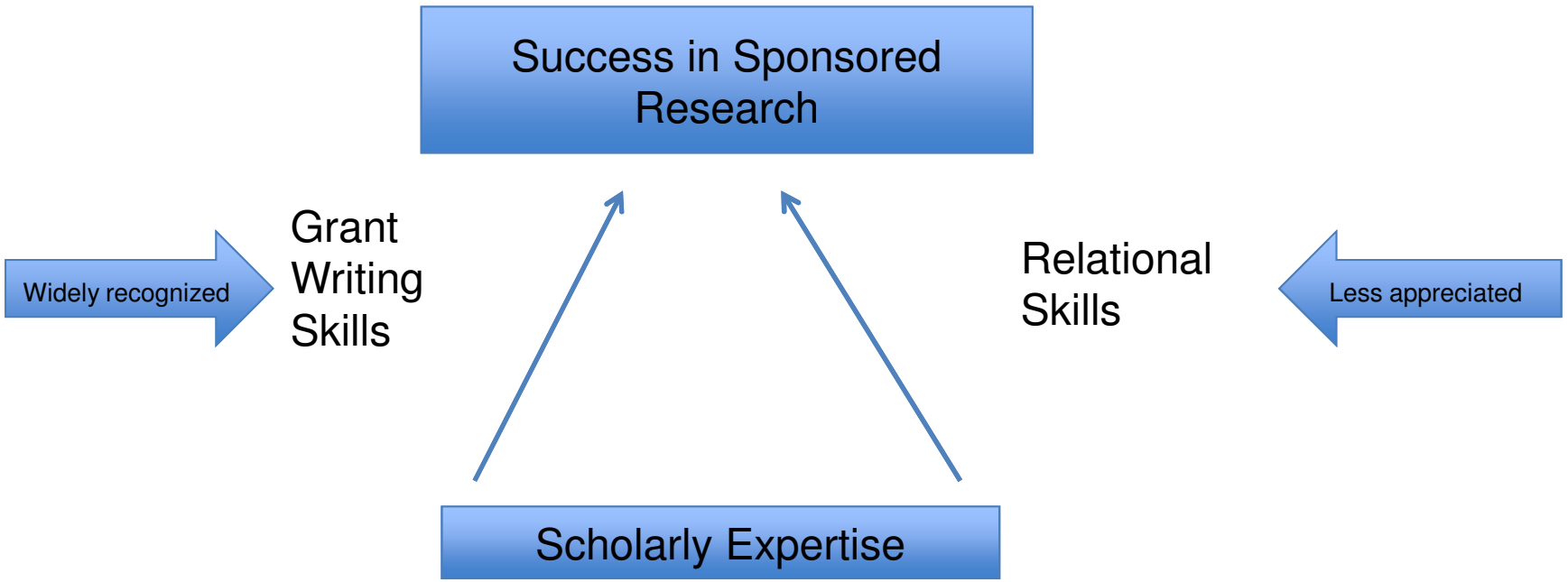

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Relational Skills with the Program Officer

- Communication with a program officer (PO) is the best possible investment of your time

- Never write a proposal before doing this!

- POs are available to you for advice and appointments (conference booths, visits to NSF)
    - Do your homework before you meet with program officers, prepare specific questions
    - POs can find out help you find out about other programs and make contacts across the Foundation

- POs are your contacts for becoming a reviewer and panelist

Note: Many good proposals are rejected because they don't land on the right desk

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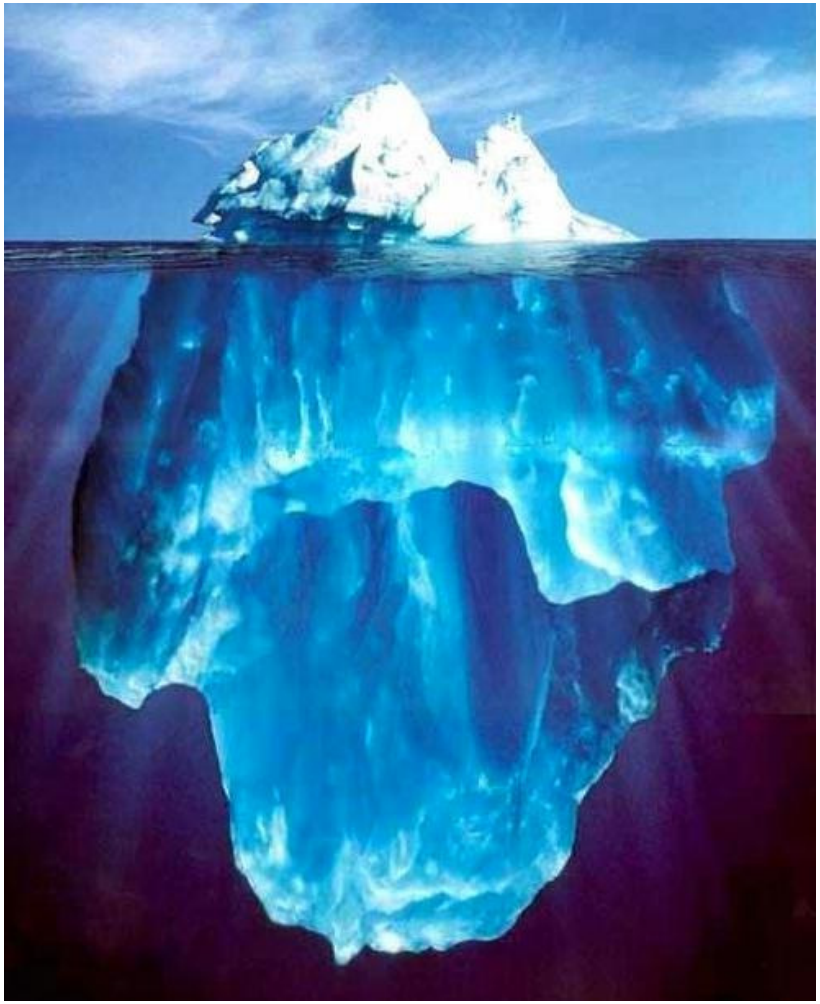
"Tip of the Iceberg"



- Published materials is just the "official line"
- Review panels, POs develop unspoken preferences
- Program priorities can change over time
- PO's response to core theme is best predictor of success
- PO's can advise on issues related to program track, budget, collaborations, project structure

Remember: Unofficial "rules of the game" can separate the winners from the losers"

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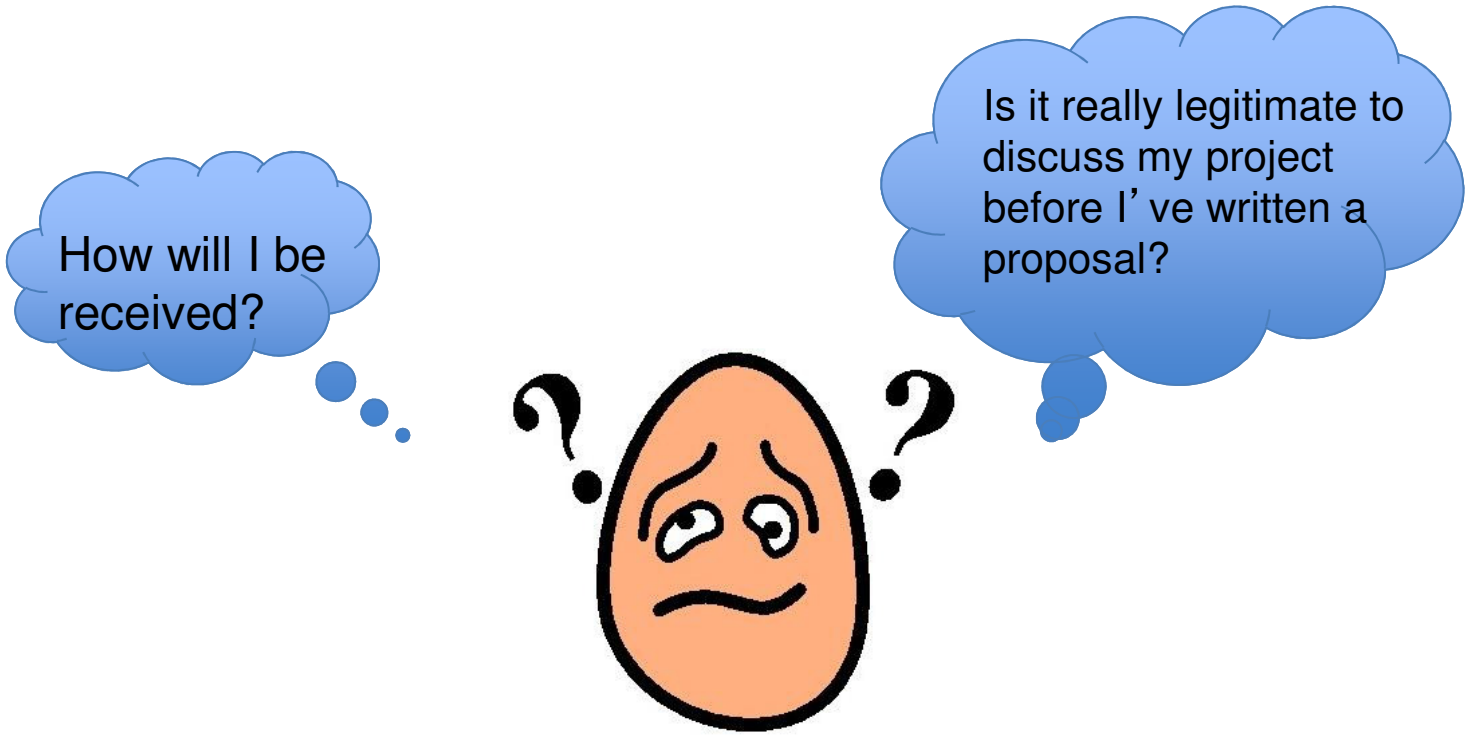
Initial Concerns



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Why Program Officers Welcome Inquiries

- Keep up with new directions in the field (POs are former academics and researcher)
- Deflect weak/inappropriate proposals
- Encourage, even coach good ideas
- Scout for new grant reviewers

Most important: Sponsors encourage a "customer service" culture (especially federal agencies)

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Plan for a Successful Encounter

1) Find the best "fit"
2) Write a preabstract, or "elevator speech"
3) Start with e-mail
4) Study the response
5) Make the call

---

6) Ask for meeting (if practical)

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(1) Find the Best "Fit"

- Develop funding search skills (COS, Grants.gov, Agency web site)
- Study program mission statement/PA
- Search recent awards, read abstracts
- Look up staff directory

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(2) Write a preabstract

- Think “elevator speech”
- Keep it brief, informal
- Specify goals, methods, outcomes
- Stress uniqueness and contribution to the field
- Rewrite and rehearse!

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(3) Send the Emails

- Multiple addresses okay
- Concise & brief: 2-3 paragraphs

to argue fit, borrow terminology from office mission or PA

- End with key questions:

"Is this the kind of project your program would consider funding?"

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(4) Study the Response

- Look for tone and nuance, as well as direct message
- Take all suggestions as instructions
- Best Results: Request for more information
- Also Good: Recommendation for completely different program
- If encouraged, plan for phone call

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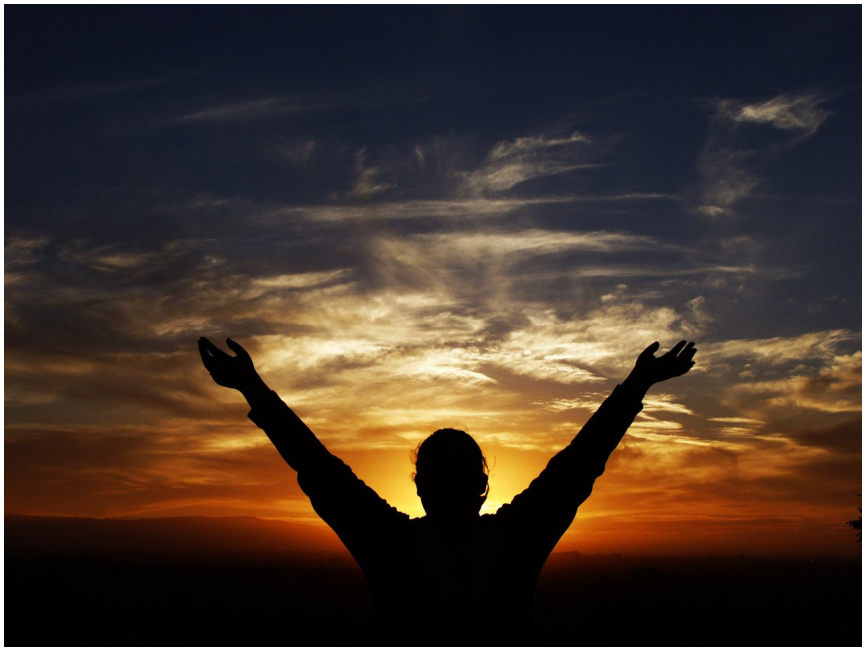
(5) Make the Call

- Remind PO of your project and emails
- Write questions out in advance
- Key questions:
  - Does my project fit your current priorities?
  - What would you recommend to improve my chances?
  - What is the anticipated success ratio?
  - Do you expect last year's average award to change this year?
  - What are some of the common reasons proposal are rejected?

- Listen for "buying signals"
- Follow up with "thank you" note, summarizing key points
- Offer to serve on a review panel
- Stay in touch (and visit, if possible)

Words of Encouragements…



“To make our way, we must have firm resolves, persistence, tenacity. We must gear ourselves to work hard all the way. We can never let up.” *Ralph Bunche, Journal of Negro Education and 1950 Nobel Peace Prize*

❖

“ I have learned that success is to be measured not so much by the position that one has reached in life as by obstacles which he has had to overcome while trying to succeed.” *Booker T. Washington, American political leader and First President of Tuskegee Institute*

❖

“Success is a journey not a destination. The doing is usually more important than the outcome.” *Arthur Ashe, professional tennis player and Civil Right leader*

Diane S. Allen-Gipson, PhD
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Top Ten Ways To Write a Good Proposal…

That Won't Get Funded

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Flaw #10

Inflate the budget to allow for negotiations.

Instead…

- **Make the budget reflect the work plan directly.**
- **Provide a budget explanation that ties your budget request to project personnel and activities.**
- **Make it clear who is responsible for what.**
- **Provide biographical sketches for all key personnel.**

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Flaw #9

Provide a template letter of commitment for your (genuine) supporters to use. (They will!)

Instead…

- **Ask for original letters of support that detail what your collaborators will do and why involvement in your project will help them.**

- **Letters from administrators are stronger if they demonstrate real commitment, e.g. release time, faculty development funds, new course approvals, etc.**

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WHERE DISCOVERIES BEGIN

Flaw #8

Assume your past accomplishments are well known.

Instead…

- **Provide results from prior funding – this includes quantitative data and information on impact.**
- **Describe how new efforts build on this previous work, and how it has contributed to the broader knowledge base about educational improvement.**
- **Recognize that the review panelists are diverse and not all familiar with your institutional context.**

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Flaw #7

Assume a project website is sufficient for dissemination.

Instead…

- **A website may be necessary, but who will maintain it and how in the long run?**
- **Engage beta test sites. Other adopters can serve as natural dissemination channels.**
- **Plan workshops and mini-courses; identify similar projects and propose sessions at regional and national meetings.**
- **Learn about and use the NSDL.**
- **Use OneNet for videoconferencing and sharing.**

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Flaw #6

Assert: "Evaluation will be ongoing and consist of a variety of methods."

Instead…

- **Plan for formative and summative evaluation.**
- **Include an evaluation plan with specific timelines and projected benchmarks.**
- **Engage an objective evaluator.**

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WHERE DISCOVERIES BEGIN

Flaw #5

Assume the program guidelines have not changed; or better yet, ignore them!

Instead…

- **Read the solicitation completely and carefully.**
- **Address each area outlined in the solicitation that is relevant to your project.**
- **Check the program solicitation carefully for any additional criteria, e.g. the Integration of Research and Education, or integrating diversity into NSF Programs, Projects, and Activities**

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WHERE DISCOVERIES BEGIN

Flaw #4

Don't check your speeling, nor you're grammer.

Instead…

- **Check and double check; first impressions are important to reviewers.**
- **State your good ideas clearly. Ignore the bad ones.**
- **Have a trusted colleague who is not involved in the project read your drafts and final proposal.**

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Flaw #3

Substitute flowery rhetoric for good examples.

Instead…

- Minimize complaints about students, other departments, the administration, etc., and describe what you will do and why.
- Ground your project in the context of related efforts.
- Provide detailed examples of learning materials, if relevant.
- Specify who you will work with and why.
- State how you plan to assess progress and student learning.
- Detail the tasks and timeline for completing activities.
- Specifically address intellectual merit and broader impacts and use the phrases explicitly in the project summary.

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(Fatal) Flaw #2

Assume page limits and font size restrictions are not enforced.

Instead…

- **Consult the program solicitation and the GPG (Grant Proposal Guide) carefully.**
- **Proposals that exceed page and/or font size limits are returned without review.**

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(Fatal) Flaw #1

Assume deadlines are not enforced.

Instead…

- **Work early with your campus Sponsored Research Officer (SRO).**
- **Test drive FastLane and grants.gov and make sure your SRO knows how to drive too!**
- **Set your own final deadline 5 days or so ahead of the formal deadline to allow time to solve problems.**

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Tips on Writing a Good Proposal…

That WILL Get Funded

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Contact a program officer before you start. "Call early, call often"

Check the NSF award database to "connect" to the community

Don't give up! The first application funding rate is 20%. The second application funding rate is 50%! REJECTION IS GOOD!

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Tips for writing proposals provided by
Jeanne Small, NSF

The opinions represented here are my own and are not necessarily those of the National Science Foundation although everything is based on the NSF published material.
www.nsf.gov