



Academic Mentoring Workshop

Writing Competitive Research Proposals

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SMART

Superior Multiprocessor ARchiTecture - <http://ceng.usc.edu/smart/>

Types of Proposals



- **Research**
 - **SIRP**
 - **Multi-investigator**
- **Research Infrastructure**
- **Education**
 - **Curriculum Development**
 - **Educational Innovation**
- **White Paper, Special Projects, RAPID, EAGER, Travel, Workshops, Postdoctoral Fellowships, Faculty Fellowships (industry or foundations), etc.**
- **Supplements – standard, REU, RET, ROA**
- **SBIR, STTR**

Meta-Tips

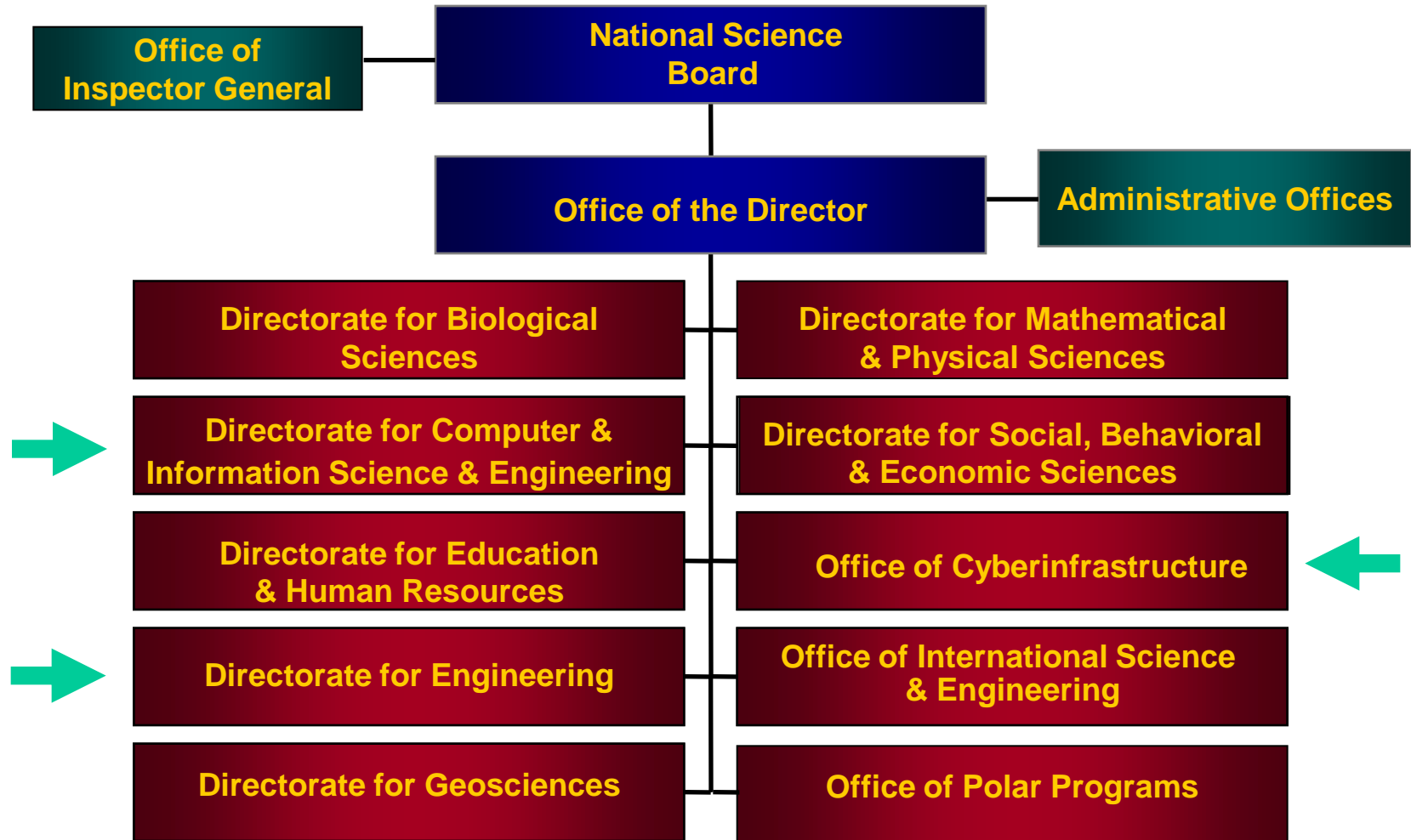


- **Know the agency's organizational structure**
- **Know your agency's programs**
 - Solicited vs. unsolicited proposals
- **Review the Summary of Awards**
 - Past trajectory
- **Know your program officer and division director**
 - Current trajectory
- **Participate in agency-sponsored workshops**
 - Help set future trajectories
- **Serve on review panels and as an ad hoc reviewer**
 - Read lots of proposals
 - Practice good citizenship
- **Develop good proposal-writing habits**



- ✓ **Types of Proposals and Meta-Tips**
- **General Funding Agency Information**
 - **DOD**
 - **NSF**
- **Research Proposal Preparation**
- **Tips for Writing Successful Proposals**
- **Some Fatal Flaws in Proposal Writing**

National Science Foundation



NSF 2012 budget request: \$7.77 billion (13% increase over 2011)
CISE 2012 budget request: \$728.4 million (17.7% increase)

NSF CISE Directorate



**Office of the
Assistant Director
for CISE**

**Computing and
Communications
Foundations (CCF)**

- **Algorithmic Foundations (AF)**
- **Communications and Information Foundations (CIF)**
- **Software, Hardware Foundations (SHF)**

**Computer and
Network Systems
(CNS)**

- **Computer System Research (CSR)**
- **Networking Technology and Systems (NeTS)**

**Information and
Intelligent Systems
(IIS)**

- **Human-Centered Computing (HCC)**
- **Information Integration and Informatics (III)**
- **Robust Intelligence (RI)**

Crosscutting CISE, NSF Emphasis Areas

- | | | | |
|--------------|----------------|------------------|-----------------------|
| • EiC | • SHW | • BPC | • CAREER |
| • CDI | • TC | • CPATH | • ADVANCE |
| • CPS | • NetSE | • REU/RET | • IGERT, GK-12 |

NSF ENG Directorate



Office of the Director

Office of the Assistant Director for ENG

CBET
Chemical, Bioeng,
Environmental, and
Transport Systems

Clusters

- **BEEH**
- **CBBS**
- **EES**
- **TTFP**

CMMI
Civil, Mechanical,
and Manufacturing
Innovation

Clusters

- **AM**
- **M&EM**
- **RSI**
- **SED**

ECCS
Electrical,
Communications,
and Cyber Systems

Clusters

- **EPMD**
- **EPAS**
- **CCSS**

EFRI
*Emerging Frontiers
in Research
and Innovation*

*(a new division
within ENG as of
October 1, 2006)*

EEC: ENG Education and Centers division

- **ERC**
- **EEP**
- **BRIDGE**
- **CAREER**
- **REU/RTE**

Outline



- ✓ **Types of Proposals and Meta-Tips**
- ✓ **General Funding Agency Information**
 - **DOD**
 - **NSF**
- **Research Proposal Preparation**
(some slides adapted from Don Ethlon, NSF)
- **Tips for Writing Successful Proposals**
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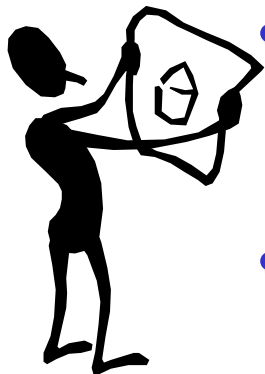
Research Proposals



A fundable proposal describes a good idea and attainable goal, well expressed and motivated, with a clear indication of methods for pursuing the idea, evaluating the findings, making them known and having broad impact.



Step 1: Carefully Read the Program Announcements and Solicitations



- **Find the right program early!**
 - It's better to do this well before you write than after you get your reviews back
- **Talk with your Program Director to make sure that your ideas fit in the program**
 - If the Program Director (PD) tells you that your ideas are too narrow or don't fit the program, look for other sources
- **Make sure that your project is worthwhile, realistic, well-planned, and innovative**

Step 2: Develop Your Good Idea



- **Key Questions**
 - What do you intend to do and how will you do it?
 - Why is it important?
 - What does the literature provide?
- **Make sure the idea is innovative and exciting**
 - Survey the literature
 - Talk with others in the field
- **Convince people that you can do it**
 - Obtain preliminary data to support feasibility
 - Determine available facilities and resources
 - What infrastructure do you have to work with?
 - With whom will you work (students, collaborators, industry partners)?

Step 3: Prepare the Proposal



- **NSF Grant Proposal Guide (GPG)**
http://www.nsf.gov/pubs/policydocs/pappguide/nsf08_1/gpg_index.jsp
- **Get it - Read it - Follow it**
- **Proposal preparation and submission**
- **Submission of collaborative proposals via**
 - **Subaward**
 - **Separate, yet linked, proposals**
- **Review criteria and review process**
- **Return without review criteria**
- **Withdrawal, declination, and award processes**

Parts of a Proposal (NSF)



- **Cover Sheet and Certifications**
- **Project Summary**
 - Both intellectual merit and broader impacts described
- **Table of Contents**
- **Project Description**
- **References cited**
- **Biographical Sketches**
- **Budget and Budget Justification**
- **Current and Pending Support**
- **Facilities, Equipment and Other Resources**
- **Supplemental Documentation**
 - ***Data Management Plan (new)***; other docs vary by programs
- **Single Copy Documents**
 - Reviewer suggestions, deviation authority, confidential information, etc.

Project Summary



- **This one page is critical because it:**
 - It may affect which program or panel will review your proposal
 - Written in 3rd person, it must include a statement addressing both merit review criteria: *Intellectual Merit* and *Broader Impacts*
 - **Proposals that do not separately address both criteria within the one-page Project Summary will be returned without review**
- **Intellectual Merit**
 - Describe the scientific/engineering problem and its importance
 - State the overall objective of the project
 - State the specific aims
 - Describe how the aims will be achieved
- **Broader Impacts**
 - Educational & outreach activities; infrastructure; dissemination of results; underrepresented groups; benefits to society
 - See <http://www.nsf.gov/pubs/gpg/broaderimpacts.pdf>

Project Description



- This is the key to a strong proposal
- Overall concept and rationale
- Hypothesis-driven or data-driven (or other)
- Execution
 - Careful
 - Thorough
 - Appropriate
- **Warning: Most NSF formal proposals are limited to 15 pages. Some preliminary proposals and other special cases may be limited to fewer pages. Check the program solicitation!**

Project Description



In 15 pages, you need to cover

- Objectives and expected significance
- Relation to present state of knowledge
- Experimental methods and procedures
- Results from prior agency-sponsored support (required, if applicable)
- Relation to your (the PI's) longer term goals
- Optional sections:
 - preface, background, preliminary studies, specific objectives, significance, experimental plan

Project Description



- **Know your audience – the reviewers, PD!**
 - Write accurately, concisely, and clearly
 - Make it easy for reviewers to like your proposal
 - You never get a second chance to make a first impression
 - First page tells it all
 - Figures and tables get your points across clearly
 - Some reviewers (particularly on interdisciplinary proposals) may not be experts in your specific field

Biographical Sketch



- **Usually limited to only two pages**
- **Professional preparation**
- **Appointments**
- **Publications**
 - 5 closely related
 - 5 other significant publications
- **Synergistic activities**
- **Collaborators & other affiliations**
 - Collaborators (last 4 yrs) & co-editors (last 2 yrs)
 - Graduate and Postdoctoral Advisors
 - Thesis Advisor and Postgraduate-Scholar Sponsor

Budget



- **Budget should be**
 - reasonable, but request what you need
 - for personnel, equipment, travel, participant support and other direct costs (subaward, consultant, computer services, publication costs)
 - for cost of educational activities associated with research, where appropriate
- **Must be accompanied by “Budget Justification” for direct cost line items**

Current and Pending Support



- **List everything, including the proposal being submitted**
 - current, pending and anticipated
- **Be careful of overlap**
 - Perception of overlap could be detrimental in the review
- **Multiple submissions**
 - when they are allowed to same program

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(some slides adapted from Don Ethlon, NSF)
- **Tips for Writing Successful Proposals**

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Get Help



- **Read:**
 - Sponsoring agency publications
 - Successful proposals
- **Look before you leap:**
 - Serve as a reviewer and panelist
- **Talk with people in-the-know:**
 - Current Program Directors
 - Former PDs (rotators or IPAs)
 - Successful colleagues
 - Sponsored projects office at your institution

Start Early and Get Feedback



- **Write:**
 - Rewrite and rewrite again...
- **Get critiques from:**
 - Mentors and colleagues
 - Previous members of review panels

Be Reasonable



- **Be aware of the scope:**
 - “Too ambitious” vs. “Too narrow”
- **Be honest and up-front:**
 - Address issues instead of trying to hide them
 - Acknowledge possible experimental problems and have alternatives

Make It Easy for Reviewers



- **Know your audience:**
 - All reviewers may not be experts in your specific field
- **Simplify and streamline:**
 - Make sure you get your main idea across
- **Pay attention to details:**
 - Run the spell checker and proof-read
 - Prepare clear photos, graphs, etc.
 - Make the font size as big as you can (minimum of 6 lines per inch with 1” page margins!)

NSF Proposal Merit Review Criteria



The Intellectual Merit of the proposed activity

- Creativity, originality, **and potentially transformative**
- Potential to advancing knowledge and understanding within and across fields
- Conceptualization and organization
- Qualifications of investigators
- Access to resources

Funding Criteria: Intellectual Merit



- How **important** is the activity to *advancing knowledge and understanding* within the field or across different fields?
 - **Significance** of *expected results*: incremental? high impact? high-risk but high-gain?
- How well **qualified** are you to conduct the research?
 - Not necessary to have track record on specific topic, but **quality** of *prior work* usually a consideration, as are **preliminary results**
- How creative, **original** are the concepts and ideas?
 - Should be **ground-breaking** in some aspect
- How well conceived, **organized** is the proposed activity?
 - *Well-articulated problem* and *well-structured research plan*
- Is there sufficient *access to resources*?
 - Ownership is not necessary, only **access** to equipment, facilities, human capital, ...

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- Qualifications of investigators
- Access to resources

• The Broader Impacts of the proposed activity

- Discovery while promoting teaching, training and learning
- Participation of underrepresented groups
- Enhancement of infrastructure for research and education
- Dissemination of results to enhance scientific and technological understanding
- Benefits to society

Funding Criteria: Broader Impacts



- Does the activity advance discovery and understanding while *promoting teaching, training and learning*?
- Does the activity *broaden the participation* of underrepresented groups (e.g., gender, ethnicity, disability, geographic, etc.)?
- Will it *enhance the infrastructure for research and education*, such as facilities, instrumentation, networks and partnerships?
- Will the *results be disseminated broadly* to enhance scientific and technological understanding?
- What may be the *benefits* of the proposed activity *to other disciplines and society as a whole*?

(See www.nsf.gov/pubs/gpg/broaderimpacts.pdf)

NSF Proposal Merit Review Criteria



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• Program-specific merit review criteria

- Some programs have additional review criteria in solicitation

• There are NSF general statements regarding intellectual merit and broader impact, but also some programs list examples of these criteria specific to the program

- See <http://www.nsf.gov/pubs/gpg/broaderimpacts.pdf>

Evaluation: Ad Hoc and Panel Reviews



- ***A minimum of 3 reviews/proposal (typically 4 or more)***
 - A score of ***E, V, G, F, P*** is given by each reviewer
 - ***Comments*** on intellectual merit and broader impacts
 - Typically, a ***recommendation*** to fund (or not) is given
- ***Panel Review:***
 - Proposals are discussed and ***evaluated collectively***
 - ***Proposal summary*** is written—couple of sentences
 - Intellectual merits are described: ***strengths and weaknesses***
 - Broader impacts are described: ***strengths, weaknesses***
 - ***Improvements*** may be suggested (optional)
 - ***Panel recommendation: Competitive or Not Competitive***
- ***Comments are intended to help unsuccessful PIs improve their proposals for the next competition***



- **Reviews**
 - **Content/justification of the reviews by reviewers oftentimes is more important than just the rating**
- **Panel Ranking**
 - **Proposals (competitive ones) often ranked by panel**
- **Program Director uses reviews and panel summary/recommendation in award decisions**
 - **Fairness**
 - **How substantive the reviews are**
 - **Technical problems raised in the reviews**
 - **major vs. minor issues**
 - **Reasons for the reviewer concerns or enthusiasm**

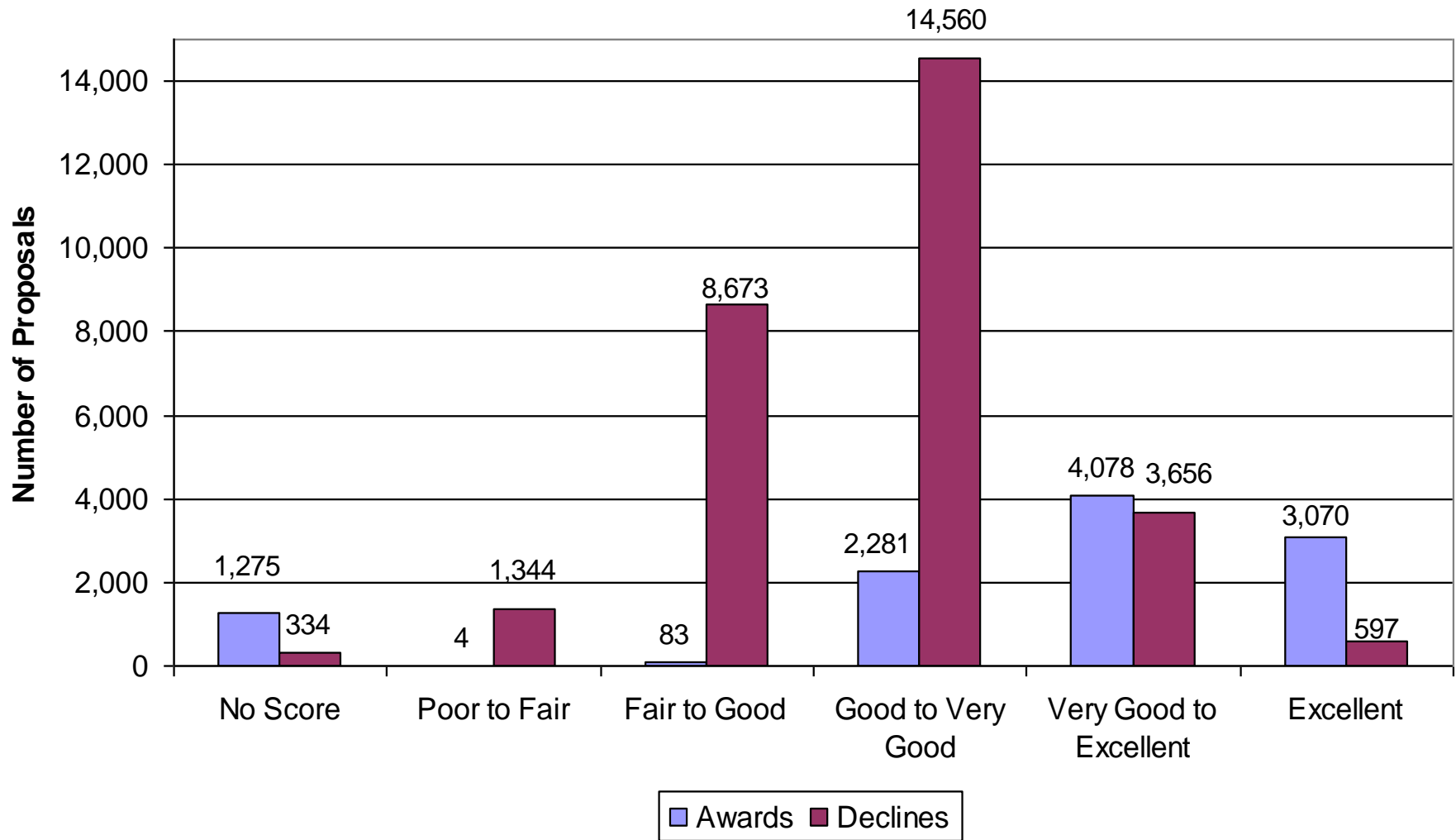


- **Program Director uses other information in addition to reviewer input in making decisions**
 - **Innovation and creativity**
 - **High risk, high reward projects**
 - **Breadth of research areas**
 - **Priority areas and systems**
 - **Demographics and diversity**
 - **Broadening participation**
 - **Institutional impact: EPSCOR, MSI, PUI, etc.**
 - **Integration of research & education**
 - **International collaborations**

NSF Proposal Review Ratings



Distribution of Average Reviewer Ratings



Number of FY'03 Proposals: 29,164 Declines, 10,791 Awards (37% success)

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Why Do Some Proposals Fail?



- **Absence of innovative ideas or hypothesis**
 - Will provide only an incremental advance
 - Not exciting or cutting edge
- **Errors**
 - Unclear or incomplete expression of aims
 - Faulty logic or experimental design
 - Less than rigorous presentation
- **Unrealistic, sloppy or incomplete**
- **Resources and facilities not in place**
 - PI qualifications/expertise not evident
 - Necessary collaborations not documented

Seven Deadly Sins of Proposal Writing



1. **Failure to focus on the key problems and payoffs**
2. **No persuasive structure: *poorly organized***
3. **No clear differentiation: *competitive analysis***
4. **Failure to offer a compelling value proposition: *potential impact***
5. **Key points are buried: *no highlights, impact is lost***
6. **Difficult to read or appreciate: *full of jargon, too many low-level technical details or not enough details***
7. **Credibility killers: *misspellings, grammatical errors, wrong technical terms, inconsistent format, ...***

Get Support in Proposal Writing



- **Agency Publications**
 - Program Solicitations
 - Grant Proposal Guide
 - Web Pages
 - Funded Project Abstracts
 - Reports, Special Publications
- **Program Directors**
 - Incumbents
 - Former “Rotators”, “IPAs”
- **Mentors on Campus**
- **Previous Panelists**
- **Serving As A Reviewer**
- **Sponsored Research Office**
- **Successful Proposals**

Closing Remarks



- There may be no “*best*” (or only) way to write a competitive research proposal, but many successful ones share similar characteristics
 - *clearly written, well motivated, organized, original, targeted, important, accomplishable, impactful, significant*
- *Funding depends* on many things, some of which are beyond your control
 - availability of funds, portfolio of existing funded research projects, set of reviewers, timing, ...
- Be persistent and give your *best effort; success will come!*

Useful NSF On-line Documents

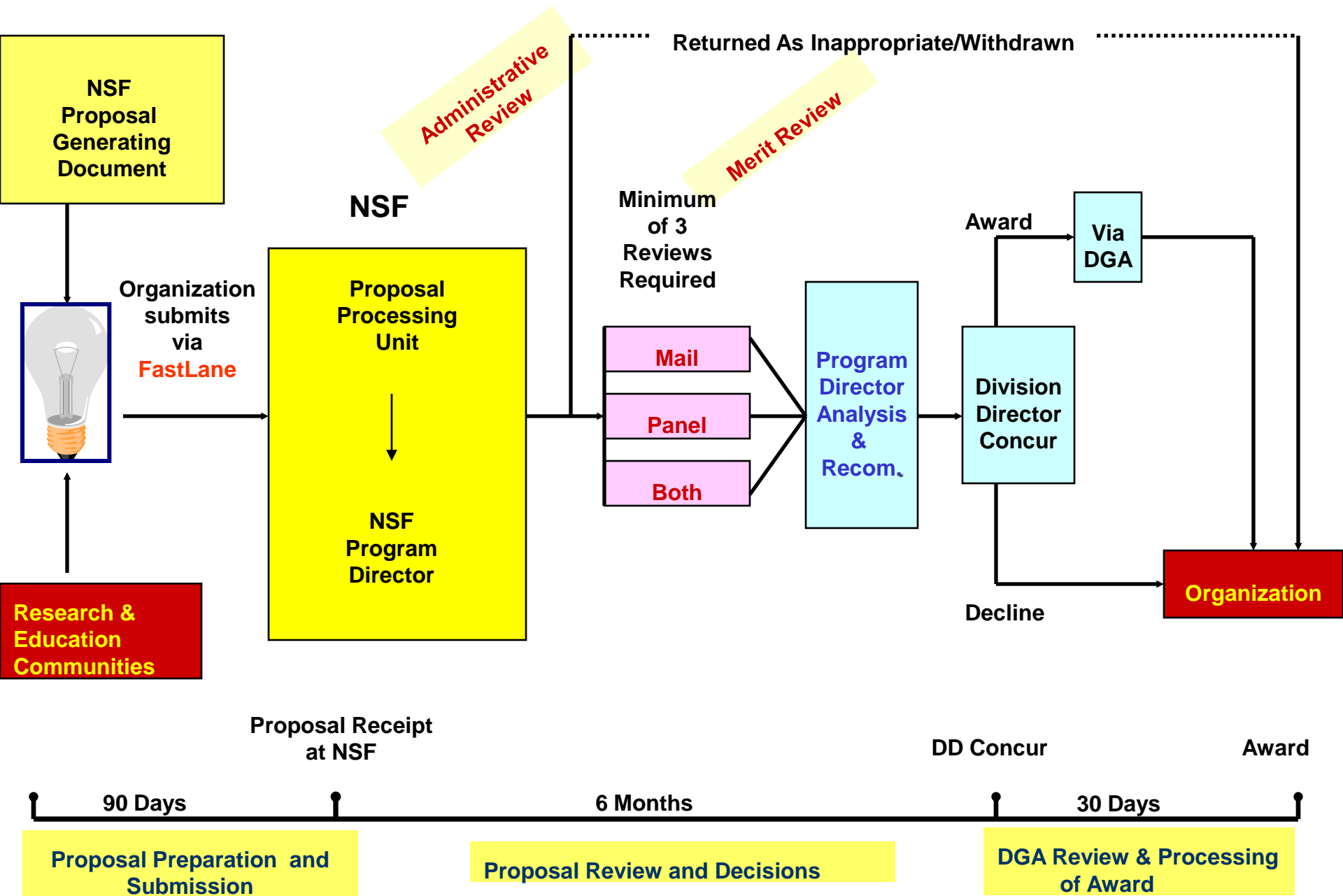


- **FY 2012 NSF Budget Request**
 - <http://www.nsf.gov/about/budget/fy2012>
- **FY 2011 NSF Budget**
 - <http://www.nsf.gov/about/budget/fy2011>
- **Grant Proposal Guide (NSF 04-23)**
 - http://www.nsf.gov/publications/pub_summ.jsp?ods_key=GPG
- **Science and Engineering Statistics**
 - [http:// www.nsf.gov/statistics/](http://www.nsf.gov/statistics/)
- **General Information**
 - <http://www.nsf.gov/>



Back- ups

NSF Proposal Review and Award Process & Timeline



Transformative Research



“Transformative Research is research driven by ideas that stand a reasonable chance of radically changing our understanding of an important existing scientific concept or leading to the creation of a new paradigm or field of science. Such research also is characterized by its challenge to current understanding or its pathway to new frontiers.”

- **See official definition given on page 10 of *Enhancing Support of Transformative Research at the National Science Foundation*, by the National Science Board found at <http://nsf.gov/pubs/2007/nsb0732/nsb0732.pdf>**

Writing a “Successful” Proposal



Baseball Analogy: How to make a “successful” pitch?

- **Pitcher:** you are the one who has “goods” that need to be pitched (conveyed or put across) “home plate”
- **Goods:** project (research ideas) you propose for funding
- **Home Plate:** the collective body of reviewers and program officer who decide if pitch “strikes” the target
- **Opposition:** the problem space in your area of research

 **Your task:** Successfully pitch your ideas and strike out the opposition, as judged by the umpire (reviewers, PO)

Writing a “Successful” Proposal



- **Three phases:** set-up, delivery, follow-through
- **Set-up phase:** set the stage for the “appropriate” pitch
 - Take into account previous events leading to current state
 - Convince home plate that
 - you have sufficiently assessed and can “take down” opponent
 - your pitch is worthwhile and significant to accomplish this
 - you have identified where your pitch is headed (the target)
 - If no set-up phase, who knows where your pitch is going or if it is the right pitch to make at this time for this opponent?
- **Set-up phase in proposal writing:** place research in context, giving current state-of-the-art and key challenges
 - Clearly articulate **problem**, your mastery of understanding it, and why solving it is important → **importance, significance**
 - Discuss how prior work fails to sufficiently address it
 - Clearly frame your proposed **idea** & approach → **originality**

Writing a “Successful” Proposal



- **Three phases:** set-up, delivery, follow-through
- **Delivery phase:** mechanics that go into executing the pitch
 - The pitcher is channeled, focused, directed
 - Best effort is put forth to structure the delivery of the pitch
 - Mechanics are followed for “delivering the goods”
 - **precise**
 - **targeted**
 - **accurate**
- **Delivery phase in proposal writing:** provide a detailed description of various components of the proposed research
 - Should provide substance (“mass”) to substantiate the validity and promise of the proposed idea → **preliminary results**
 - Discuss tradeoffs and possible new problems that may arise
 - Stay focused; don’t deviate too far in morass of uncertainties
 - Write to the level that an expert on the topic would appreciate and assess that you are **qualified** to perform the research

Writing a “Successful” Proposal

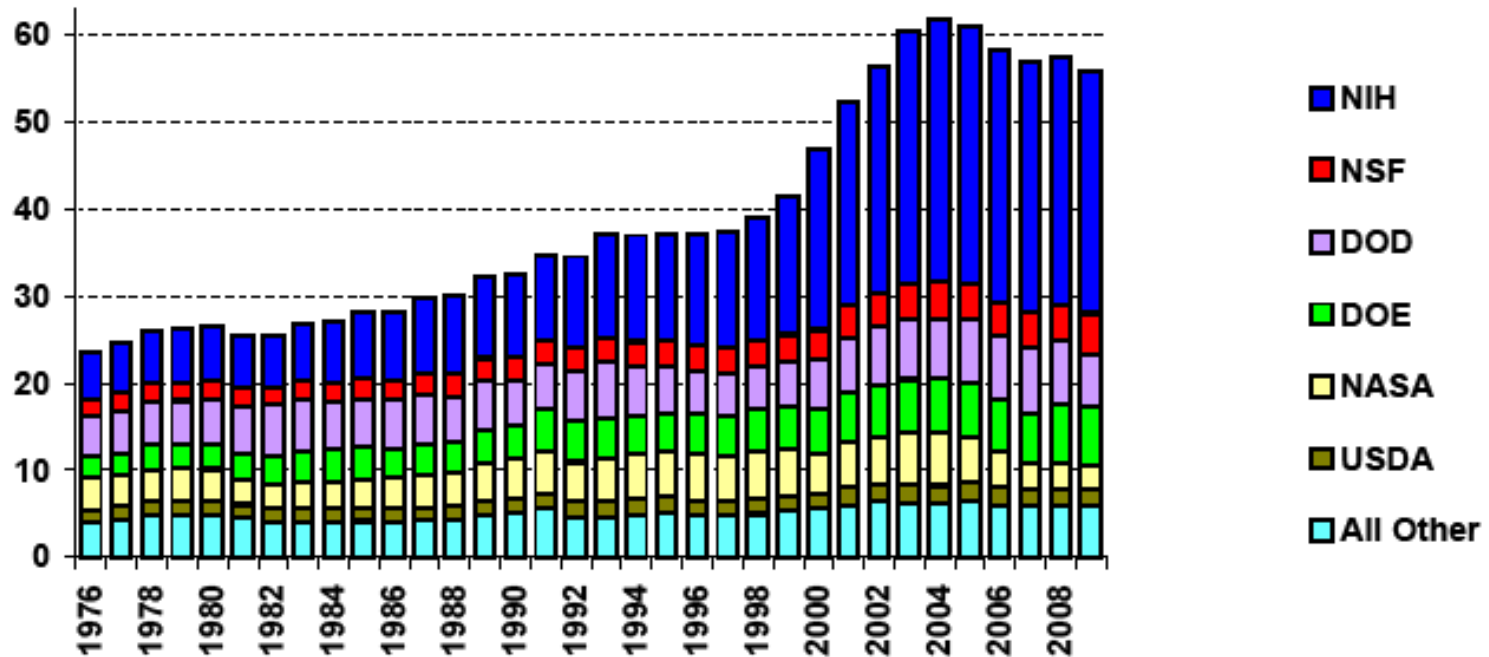


- **Three phases**: set-up, delivery, **follow-through**
- **Follow-through phase**: without follow-through, the pitch will never reach home plate
 - Must see the pitch all the way through: from the fingertips to the point at which it reaches the target at home plate
- **Follow-through phase in proposal writing**: provide a **plan** for seeing the research through to completion
 - Devise an **organized** plan of attack for carrying out research
 - The research plan may include
 - methods/tools for analysis, simulation, evaluation, experiments
 - descriptions of your prior work, effectiveness, qualifications
 - required **resources**, personnel, collaborations, facilities
 - expected timelines, milestones, results, artifacts, prototypes, implementations, contributions, dissemination, opportunities
 - **broader impacts**: training, education, outreach, development

Trends in Research by Agency, FY 1976-2009 *

in billions of constant FY 2008 dollars

ACA and ARRA to grow
NSF, DOE, NASA, NIST



Source: AAAS analyses of R&D in annual AAAS R&D reports.
 * FY 2009 figures are latest AAAS estimates of FY 2009 request. Research includes basic research and applied research. 1976-1994 figures are NSF data on obligations in the Federal Funds survey.
 FEBRUARY '08 PRELIMINARY © 2008 AAAS

2009 DOD does not show adds Congress will insert in the appropriations bill



Principal DOD Basic Research Funding Offices



Service Research Offices (OXR's)

Army Research Office (ARO)

www.aro.army.mil/

Air Force Office of Scientific Research (AFOSR)

www.afosr.af.mil/

Office of Naval Research (ONR)

www.onr.navy.mil/

Army Medical Research and Materiel Command

<https://mrmc-www.army.mil>

CDMRP (Congressional adds)

<http://cdmrp.army.mil>

TATRC (Congressional adds)

www.tatrc.org/

Army Research Inst for Behavioral & Social Sciences

www.hqda.army.mil/ari

DARPA Defense Science Office (DSO)

www.darpa.mil/dso/

Microsystems Technology Office (MTO)

www.darpa.mil/mto/

Information Processing Techniques Office (IPTO)

www.darpa.mil/ipto/

Transformational Convergence Technology Office (TCTO)

www.darpa.mil/tcto/

Defense Threat Reduction Agency (DTRA)

www.dtra.mil/

AMRMC Army Medical Research and Material Command

DARPA Defense Advanced Research Project Agency

DTRA Defense Threat Reduction Agency

CDMRP Congressionally Directed Medical Research Program

TATRC Telemedicine and Advanced Technology Research Center

Source: Jim Murday, USC

Defense Research Sciences (DRS) Program



What: **Largest source of DOD funding for University research**
Majority invested in single investigator efforts (as opposed to URI)
OXR DRS Broad Area Announcements (BAA) are relatively generic
OXR Program Officer (PO) key to success (presuming convincing proposal)
Each PO has focused interests, coupling science with some military need
Each Service has specifically identified program interests (websites and BRP)

How Much: typically \$100 – 200K/yr for three years (with continuation possible)
OXR programs typically have ~20% turn over each year

When: **Initial “white paper” useful (sometimes required)**
Proposals nominally anytime, but spring/early summer to be timely
Most funding decisions processed in fall, early winter – after appropriation bill

Where: Mix of paper and electronic (grants.gov), see for instance
<http://www.onr.navy.mil/Contracts-Grants.aspx>

	<u>FY10</u>
ARO	~\$173M
AFOSR	~\$321M
ONR	~\$414M
DARPA	~\$226M

BRP: Basic Research Plan

Source: Jim Murday, USC

Other DOD S&T Programs beyond DRS



CDMRP	Congressional Directed Medical Research Programs
DMRDP	Directed Medical Research and Development Program
MURI	Multidiscipline University Research Initiative
HEL MRI	High Energy Laser, Multidisciplinary Research Initiative
GICUR	Government-Industry Co-sponsorship of University Research
DURIP	Defense University Research Instrumentation Program
DTRA	Defense Threat Reduction Agency
CBDP	Chemical, Biological Defense Program
HPC	High Performance Computing
YIP	Young Investigator Program
PECASE	Presidential Early Career Award in Science and Engineering
NDSEG	National Defense Science and Engineering Graduate
NDEP	National Defense Education Program
STTR/SBIR	Small Business Technology Transfer / Small Business Innovative Research
DEPSCOR	Defense Experimental Program to Stimulate Competition



Defense Advanced Research Projects Agency (DARPA)

www.darpa.mil



What: Research and technology where risk and payoff are both very high, and success may provide dramatic advances for military roles and missions

Defense Science Office (DSO)
Information Processing Technology Office (IPTO)
Transformational Convergence Technology (TCTO)

Microsystems Technology Office (MTO)
Strategic Technology Office (STO)
Tactical Technology Office (TTO)

- Larger programs available than at OXRs (some managed by OXR POs)
- Team with industrial partners
- First deliverable milestone in 12-18 months; “prototype” in 3-5 years

How much: \$100K – \$10M/yr in DSO, as an example

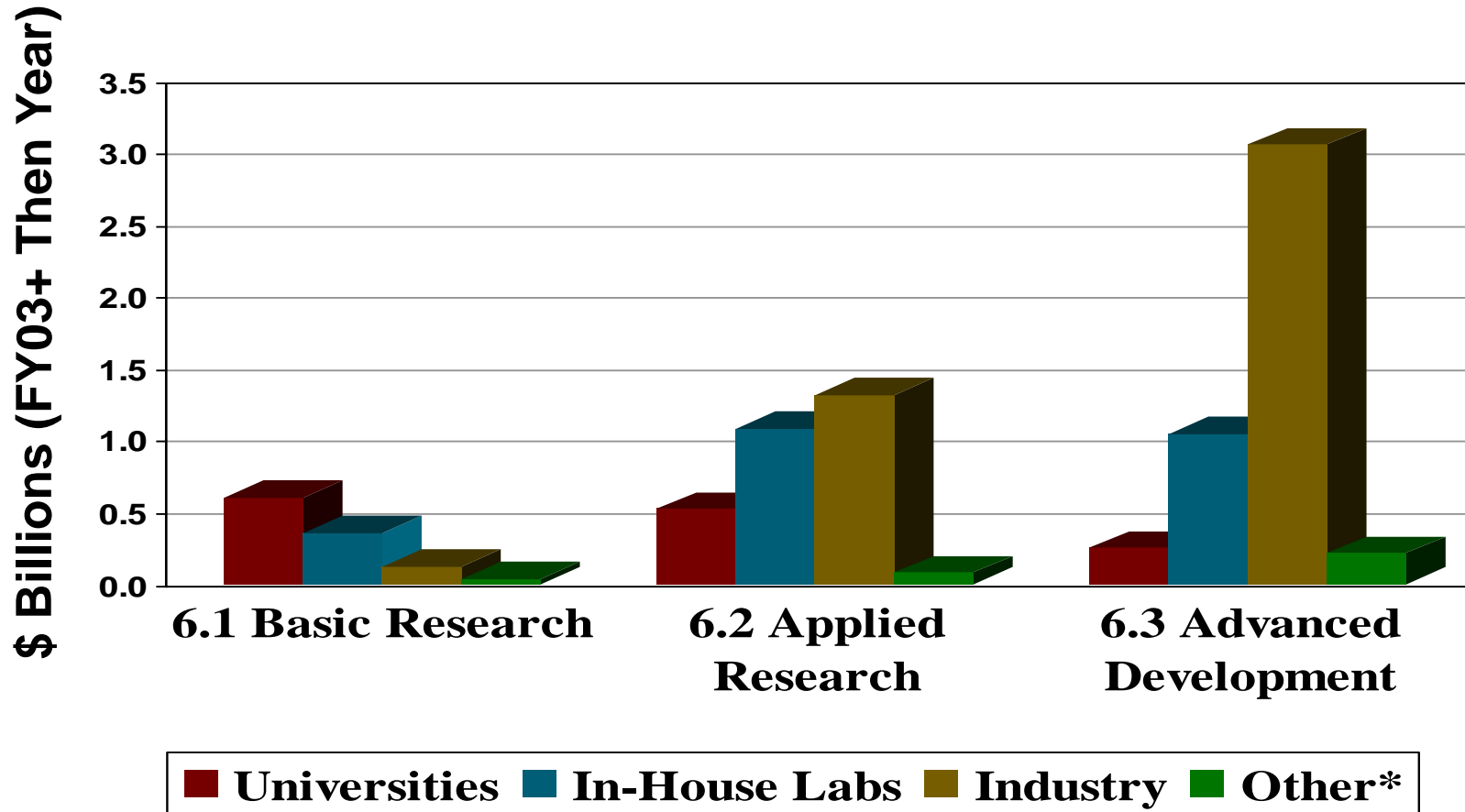
DARPA program managers often fund studies (“seedlings”) as initial research to determine if a more formal program is appropriate.

When: Variable—need to watch for program topic announcements
Involvement in topic-formative workshops very helpful

Where: www.darpa.mil/funding_opportunities.html
www.darpa.mil/index.html#tech

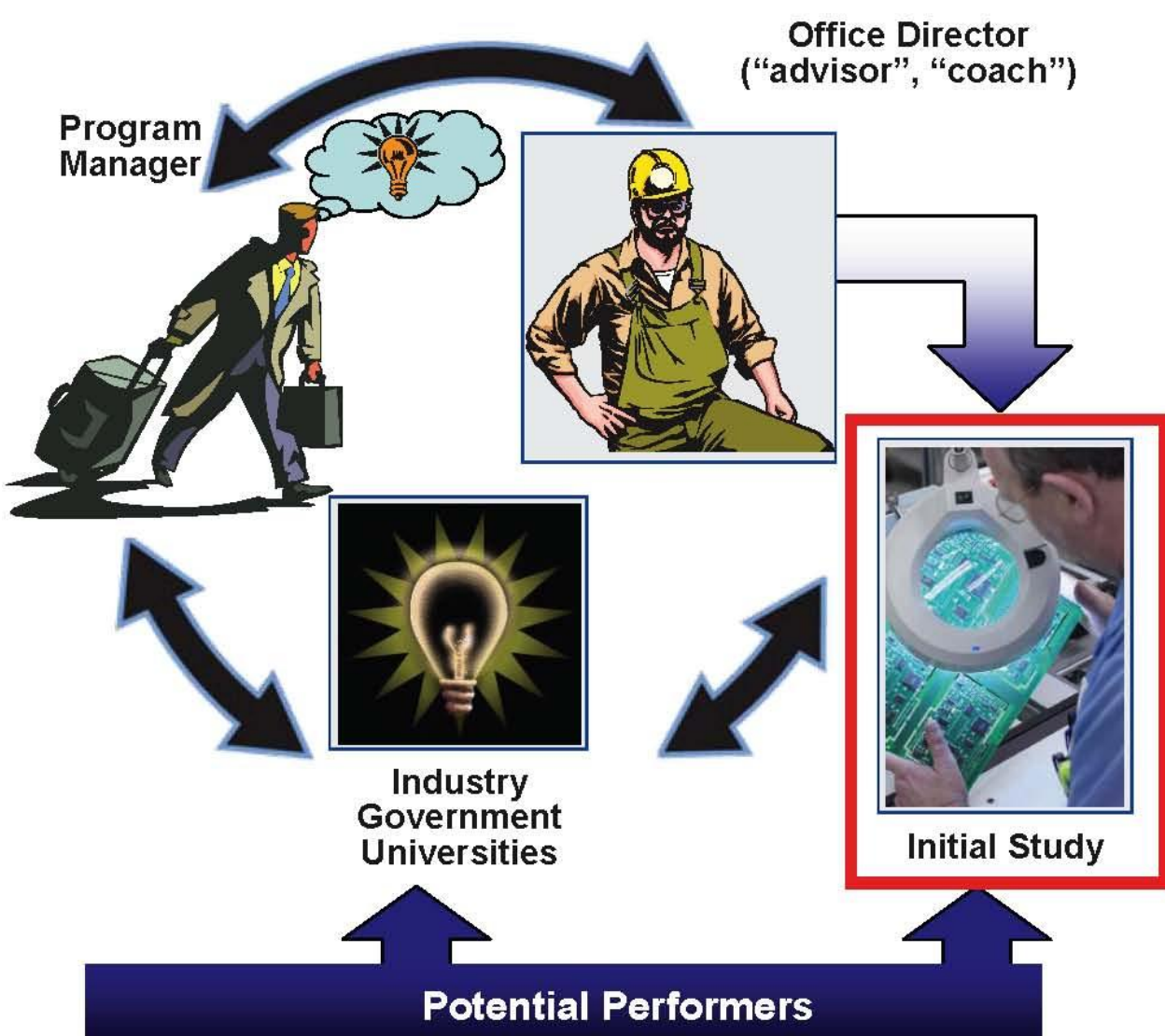
	<u>FY10</u>
6.1	~\$226M
6.2	~\$1,235M
6.3	~\$1,640M

Recipients of DOD S&T Funds



***Includes non-profit institutions, State & local govt., & foreign institutions**

Source: National Science Foundation Report, Volume 48 (FY 2003)



PMs Receive White Papers from all sources (academia, industry, national labs).

Some are passed to other PMs.

Some are read and discarded

Some are interesting to PMs

- Related to a possible future program
- Trigger interest in a future program
- Solve a key challenge emerging in an existing program

PM works with Office Director, Proposer, other PMs to refine interest, define a decisive short-term study, make funding decision

Key Step : Initial White Paper



White Paper for Seedling



Industry
Government
Universities

What is a White Paper?

The goal of a white paper is to capture the interest of a PM in your idea. Successful white papers are :

Short and Focused

Identify a Problem

Describe a Solution

Focus on Key Challenge and Effort Needed

Outline a Decisive Plan

Typical length ~ 1 year. Typical Budget ~\$300K

Include some graphics, and possibly a Penta-Chart

<http://www.darpa.mil/MTO/solicitations/baa09-36/files/attachment2.pdf>

When to Send? Anytime. We receive white papers almost every day of the year.

http://www.darpa.mil/mto/programs/yfa2007/presentations/Seedlings_and_BAAs.pdf

DOD Young Investigator Programs (YIP)



What: Outstanding new faculty members at institutions of higher education, to support their defense-related research (of interest to funding agency), and encourage their teaching/research careers

- ARO, AFOSR, ONR: must be US citizen / permanent resident
- DTRA: has no citizenship or residency requirement
- DARPA: requires clearance eligibility
- Services/DTRA - received Ph.D. or equivalent degrees within the last five years
- DARPA – tenure track assistant/associate professors within 6 years of appointment

How Much: ARO - not to exceed \$60K/yr for three years

AFOSR - \$120K/yr for three years

ONR - up to \$170K/yr for three years, additional support possible for capital equipment or collaborative research with a Navy laboratory

DTRA - \$100K/yr for two years

DARPA - \$300K for up to two years

When: Anytime for ARO

July 28, 2009 for the Air Force FY10 competition

January 12, 2009 for Naval FY09 competition

2 November 2009 for the DTRA period 4 competition

Feb 16, 2009 for for the DARPA FY09 competition

Where: See BAAs on OXR websites

Presidential Early Career Award Science and Engineering (PECASE)



- What:** White House award to recognize some of the finest scientists and engineers who, while early in their research careers, show exceptional potential for leadership at the frontiers of scientific knowledge during the twenty-first century
- Candidates must hold tenure-track positions at U.S. Univ. or College
 - Have received their Ph.D. degree within the preceding 5 years
 - Typically 2 nominees per Service (and nominees from NSF)

How Much: ~\$200K/yr for five years (cost borne by OXRs)

When: Submitted to White House in October

Where: OXRs submit nominees from their grantees – typically YIPs