



NSF Overview, Opportunities, and Obstacles

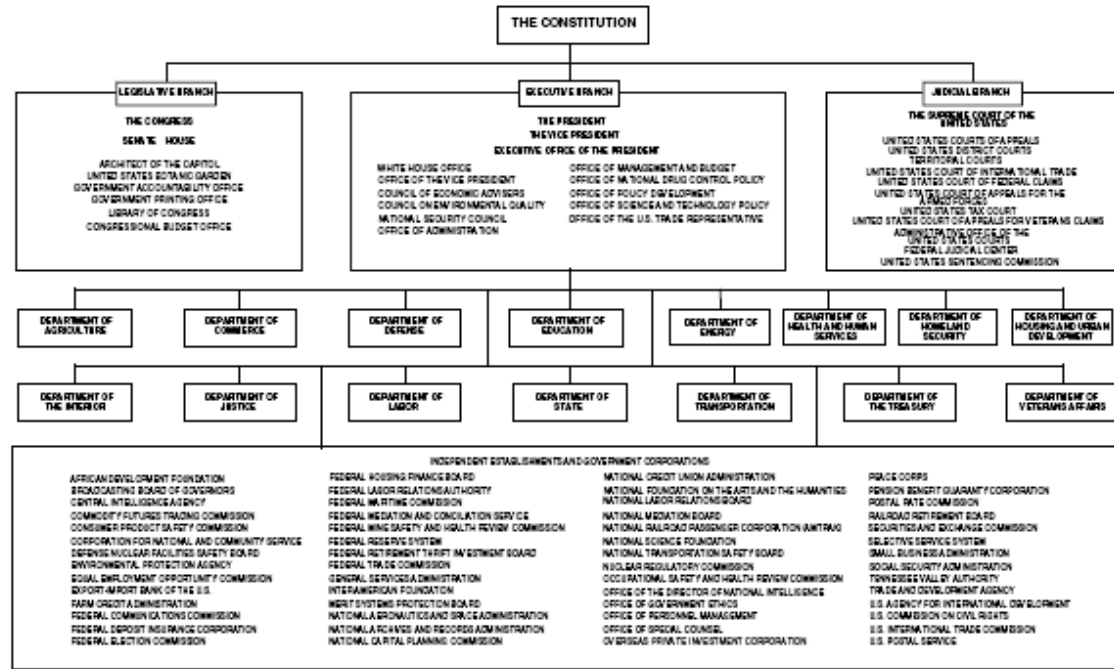
Dr. Edward J. Hackett

Directorate for Social, Behavioral, and
Economic Sciences

National Science Foundation

- Established by Congress in 1950 “to promote the progress of science; to advance the national health, prosperity, and welfare...”
- Independent agency—outside Cabinet
- Guided by National Science Board
- Merit review (from ONR) & COV (since mid-1970s) to award grants & evaluate process
- Permeable—borrows university faculty
- Budget: about \$6B (€ 4.5B)

THE GOVERNMENT OF THE UNITED STATES



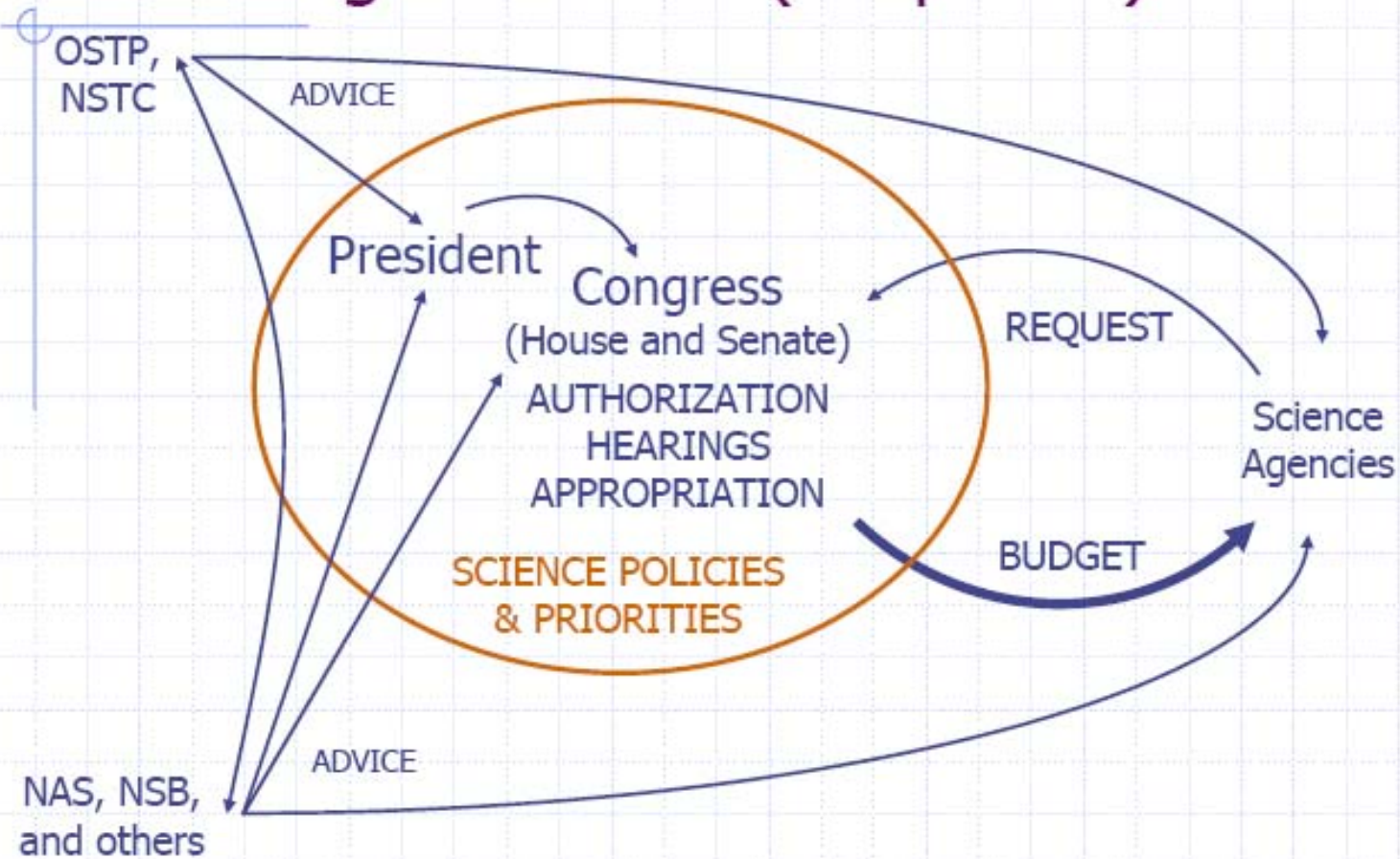
The National Science Board



FY 2008 Budget Request

\$6.43 billion
+\$520M 8.8%

The Budget Process (simplified)

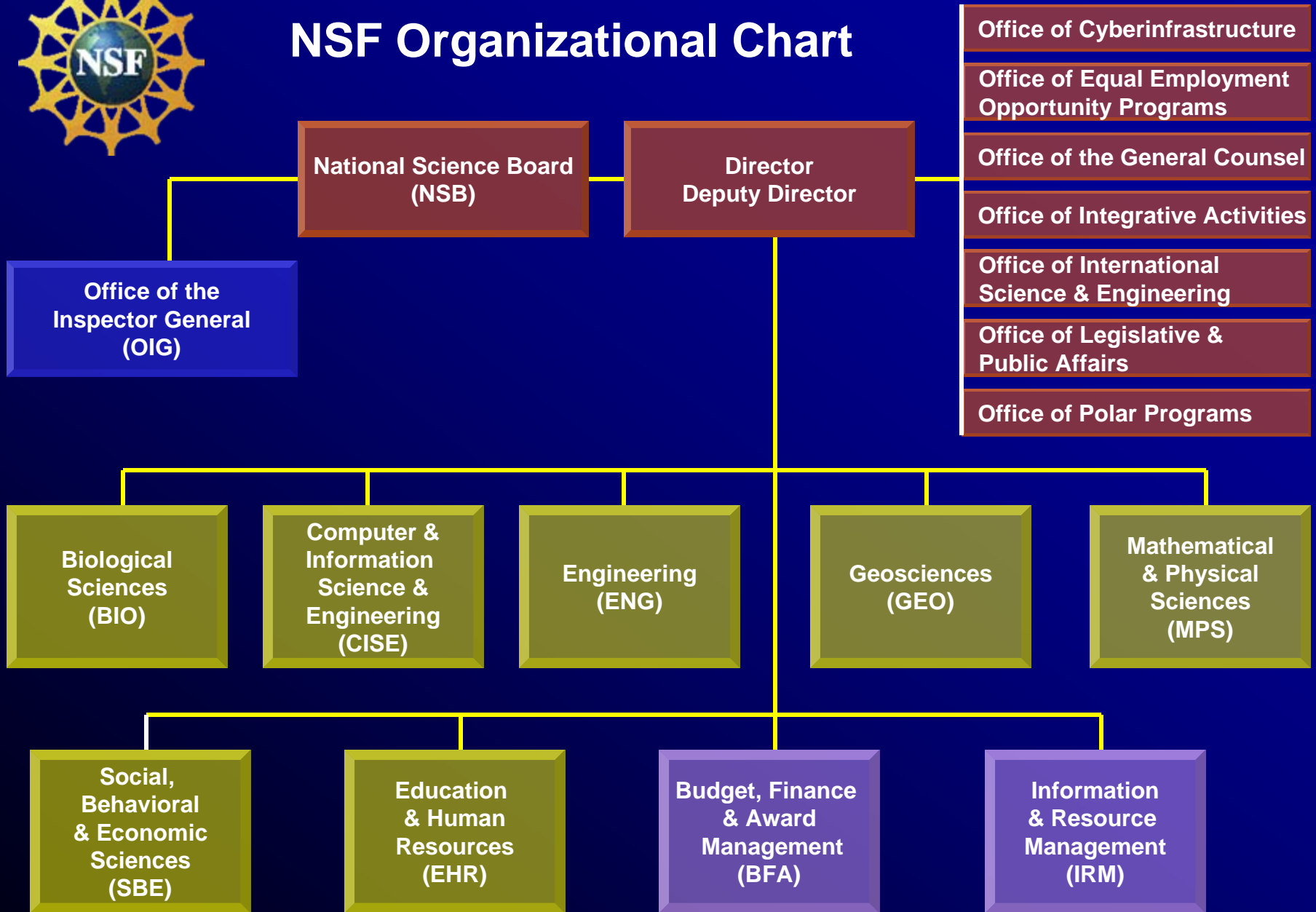


NSF PROPOSAL STATISTICS (FY 2006)

- **42,376 proposal actions**
- **~254,000 reviews**
- **~58,000 reviewers**
- **10,430 awards**
- **25.0% funding rate
(Research 21%)**



NSF Organizational Chart



Social and Economic Sciences

FY08 Program Allocations (approximate)

- Cross-Directorate Activities \$3.2M
- Decision, Risk, & Management Sciences \$6.5M
- Economics \$23.5M
- Innovation and Organizational Sciences \$2.5M
- Law and Social Science \$4.5M
- Methodology, Measurement & Statistics \$3.7M
- Political Science \$7.4M
- Science, Technology and Society \$8.0M
- Sociology \$7.4M



Division of Social and Economic Sciences (SES)

- Supports research to develop and advance scientific knowledge focusing on economic, legal, political and social systems, organizations, and institutions
- Supports research on the intellectual and social contexts that govern the development and use of science and technology





Cross-Directorate Activities

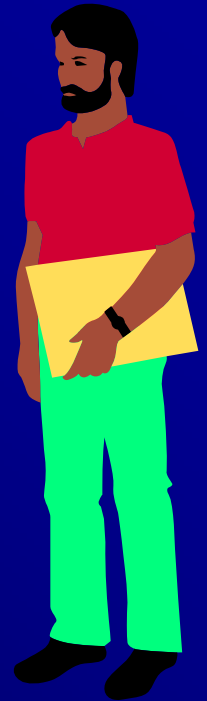
- Administers and coordinates programs to increase underrepresented groups in science and engineering for all SBE
- Supports human resource development and infrastructure improvement
- Minority Postdoctoral Fellows; REU Centers

Program Officer: Fahmida Chowdhury



Decision, Risk, and Management Sciences

- Supports research that explores fundamental issues in judgment and decision making, risk analysis, management science, and organizational behavior
- Research must be relevant to an operational or applied context, grounded in theory, and based on empirical observation or subject to empirical validation



Program Officers: Robert O'Connor, Jacqueline Meszaros and Jon Leland



Economics



- **Supports:**

- Both empirical and theoretical economic analysis as well as work on methods for rigorous research on economic behavior
- Research designed to improve the understanding of the processes and institutions of the U.S. economy and of the world system of which it is a part
- Almost all subfields of economics including: econometrics, economic history, finance, industrial organization, international economics, labor economics, public finance, macroeconomics, and mathematical economics

Program Officers: Dan Newlon, Nancy Lutz, George Von Furstenberg



Innovation and Organizational Sciences

- Supports research which uses theory combined with empirical validation
- Looks to expand the concepts, models and methodologies of change in organizations and institutions
- In FY06, IOS is particularly interested in studies that shed light on how best to organize research when essential resources are shared.



Program Officer: Jacqueline Meszaros



Methodology, Measurement, and Statistics

- Seeks proposals that are interdisciplinary in nature, methodologically innovative, and grounded in theory, such as:
 - Models and methodology for social and behavioral research
 - Statistical methodology/modeling directed towards the social and behavioral sciences
 - Methodological aspects of procedures for data collection



Program Officer: Cheryl Eavey



Law and Social Science

- Supports social scientific studies of law and law-like systems of rules, institutions, processes, and behaviors
- Topics can include, but are not limited to
 - research designed to enhance the scientific understanding of the impact of law
 - human behavior and interactions as these relate to law
 - the dynamics of legal decision making
 - the nature, sources, and consequences of variations and changes in legal institutions

Program Officer: Susan Haire



Political Science

- Supports scientific research that advances knowledge and understanding of citizenship, government, and politics
- Substantive areas include, but are not limited to:
 - American government and politics
 - comparative government and politics
 - international relations
 - political behavior
 - political economy
 - political institutions
- Supports Doctoral Dissertation Research Improvement Grants



Program Officers: Brian Humes and Phil Paolino



Sociology

- **Supports theoretically-grounded research on patterns of social relationships and the causes and consequences of human behavior, social structure and social change. Studies range from micro to macro levels of interaction.**
- **Topics include, but are not limited to:**
 - ✓ Stratification, labor markets, mobility, social change
 - ✓ Organizations, networks, economic and workplace change
 - ✓ Crime, delinquency, social organization and social control
 - ✓ Race, ethnicity, social identity/interactions, culture, education
 - ✓ Family, gender, population, migration, immigration
 - ✓ Social movements, political processes, globalization and more
- **The Program supports research that uses the range of social science methodologies — experimental, quantitative, qualitative and the combinations of multiple methods—for original data collection and secondary data analysis.**

Program Officers: Patricia White and Kevin Gotham



Science, Technology & Society

S&S considers proposals that examine questions that arise in the interactions of engineering, science, technology, and society.

There are four components:

- Ethics and Values in Science, Engineering and Technology (EVS)**
- History and Philosophy of Science, Engineering and Technology (HPS)**
- Social Studies of Science, Engineering and Technology (SSS)**
- Studies of Policy, Science, Engineering and Technology (SPS)**

The components overlap, but are distinguished by the different scientific and scholarly orientations they take to the subject matter, as well as by different focuses within the subject area.

Program Officers: Fred Kronz, Laurel Smith-Doerr, Steve Zehr



SES Target Dates

January 15 & August 15

Economics

Law and Social Science

Methodology, Measurement & Statistics

Political Science

Sociology

January 18 & August 18

Decision, Risk, & Management Sciences

February 1 & August 1

Science and Society

February 2

Innovation and Organizational Sciences

Division of Behavioral and Cognitive Sciences

- Supports research to develop and advance scientific knowledge focusing on human cognition, language, social behavior, and culture
- Supports research on the interactions between human societies and the physical environment



Behavioral and Cognitive Sciences

FY08 Program Allocations (approximate)

- Archaeology & Archaeometry \$6.5M
- Cultural Anthropology \$3.4M
- Cognitive Neuroscience \$6.3M
- Developmental & Learning Sciences \$7.0M
- Geography & Regional Science \$6.2M
- Linguistics \$7.4M
- Perception, Action, & Cognition \$6.3M
- Physical Anthropology \$3.8M
- Social Psychology \$5.7M





Archaeology

Funds:

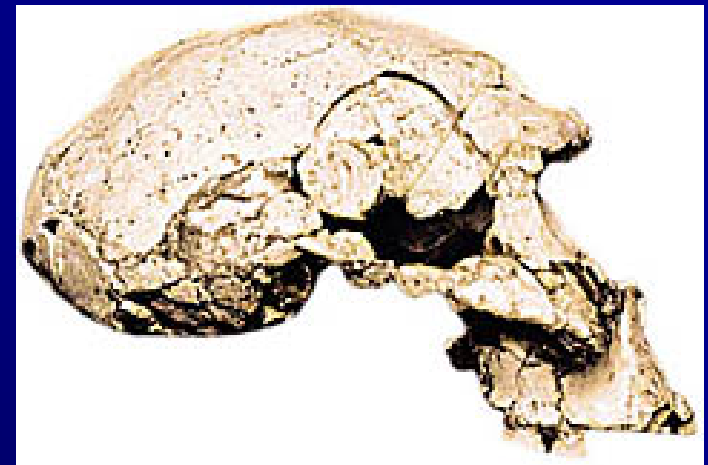
1. Archaeological research that contributes to an anthropological understanding of the past
2. Anthropologically significant archaeometric research

Program Officer: John Yellen



Physical Anthropology

- Supports basic research in areas related to:
 - Human Evolution
 - Anthropological Genetics
 - Human Adaptation
 - Skeletal Biology
 - Primate Biology
 - Ecology and Behavior
- Grants are often characterized by:
 - An underlying evolutionary framework
 - A consideration of adaptation as a central theoretical theme
 - Generalizable Results
- Serves as a bridge between the social and behavioral sciences and the natural and physical sciences



Program Officer: Joanna Lambert



Cultural Anthropology

- Promotes basic scientific research on the causes and consequences of human social and cultural variation
- Supports social scientific research of theoretical importance in all theoretical and empirical subfields

Program Officer: Deborah Winslow



Cognitive Neuroscience

- Program supports highly innovative and interdisciplinary proposals
- Proposals should aim to advance a rigorous understanding of how the human brain supports:
 - thought
 - perception
 - affect
 - action
 - social processes
 - and other aspects of cognition and behavior, including how such processes develop and change in the brain and through evolutionary time.



Program Officer: Stacia Friedman-Hill and Douglas Whalen



Developmental and Learning Sciences



- Supports studies that increase our understanding of cognitive, social, and biological processes related to children and adolescents' learning in formal and informal settings
- Supports research on learning and development that:
 - incorporates multidisciplinary, multi-method, microgenetic, and longitudinal approaches
 - develops new methods and theories
 - examines transfer of knowledge from one domain to another
 - assesses peer relations, family interactions, social identities, and motivation
 - examines the impact of family, school, and community resources
 - assesses adolescents' preparation for entry into the workforce
 - investigates the role of demographic and cultural characteristics in children's learning and development

Program Officer: Amy Sussman



Linguistics

- Supports scientific research of all types that focus on human language as an object of investigation
 - the syntactic, semantic, phonetic, and phonological properties of individual languages and of language in general
 - the psychological processes involved in the use of language
 - the development of linguistic capacities in children
 - social and cultural factors in language use, variation, and change
 - the acoustics of speech and the physiological and psychological processes involved in the production and perception of speech
 - the biological bases of language in the brain

Program Officer: Joan Maling and Terry Langendoen



Perception Action and Cognition

- Supports basic research on human cognitive and perceptual functions
- Topics include, but are not limited to:
 - Attention
 - Memory
 - Spatial Cognition
 - Language Processing
 - Perceptual and Conceptual Development
 - Visual, Auditory, and Tactile Perception
 - Reasoning
- Research supported by the program encompasses a broad range of theoretical perspectives such as Symbolic Computation, Connectionism, and Dynamical Systems

Program Officer: Ping Li, Betty Tuller



Social Psychology

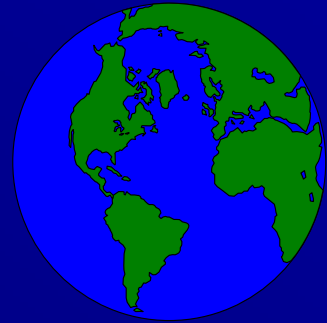
- Supports research on human social behavior, including cultural differences and development over the life span
- Among the many research topics supported are:
 - attitude formation and change
 - social cognition
 - personality processes
 - interpersonal relations and group processes
 - the self, emotion, social comparison and social influence
 - the psychophysiological correlates of social behavior

Program Officers: Amber Story and Kellina Craig - Henderson



Geography and Regional Science

- Supports research on human, physical, and biotic systems on the Earth's surface, as well as their related subfields
- Investigations into the nature, causes, and consequences of human activity within particular "places and spaces" are encouraged
- Both international & domestic projects which may contribute to related fields are also funded



Program Officers: Dan Hammel & Kenneth Young



BCS Target Dates

December 1 & July 1

Archaeology & Archaeometry

Physical Anthropology

January 1 & August 1

Cultural Anthropology

January 15 & July 15

Cognitive Neuroscience

Developmental & Learning Sciences

Human Cognition & Perception

Linguistics

Social Psychology

January 15 & August 15

Geography & Regional Science

Doctoral Dissertation Improvement Awards

Small grants to provide funds for items not normally provided through the student's institution

- Archaeology
- Cultural Anthropology
- Decision, Risk, & Management Science
- Economics
- Geography & Regional Science
- Law and Social Science
- Linguistics
- Physical Anthropology
- Political Science
- Science and Society
- Sociology



Dr. Marburger's Challenge

- A new “social science of science policy” is needed to define appropriate data elements and to create models that can be useful to policy experts
- Global science and policy communities must collaborate on advancing a new interdisciplinary field of science policy studies
- Policymakers need predictability of outcomes

SciSIP's Goals

- Measurement: improve and expand science *metrics, datasets* and *analytical tools*
- Understanding: develop usable *knowledge* and *theories*
- Community development: coordinate efforts among federal agencies, cultivate a community of experts focusing on SciSIP
- International partnerships that promote science and technology advancements

Investigator Initiated Research (1)

- Theoretical and conceptual models of scientific discovery and technological innovation
 - Psychological and organizational studies of discovery and innovation
 - Agent-based and network model development
- Statistical and econometric tools for estimating returns to science and engineering investments
 - Sector-specific science metrics involving relevant scientific communities
 - Comparisons of public and private R&D expenditures and returns

Investigator Initiated Research (2)

- Qualitative tools
 - Case studies
 - Ethnographic studies
 - Retrospective analyses
 - Cross-national comparisons
- Bibliometric tools
- Cyber-tools
- Many levels of analysis: cognitive, organizational, regional, national, and transnational
- Interdisciplinary and international collaborations encouraged

Contact info

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News

- HSD ends: \$32M in SBE for ???
 - Complexity?—programs? DCL?
 - Environment?—CNH? LTERs? DMUUs?
 - Infrastructure?—ANES, GSS, PSID
- SGER-> Rapid & EAGER?
- Cyber-enabled Discovery and Innovation

Outline

- Proposal review process
 - Submission
 - Administrative Review
 - Merit Review
 - Decisions
- Research proposal preparation

Proposal Submission

- How?
 - Via FastLane (<https://www.fastlane.nsf.gov>) *or* Grants.gov (<http://www.grants.gov>)
- Who?
 - Universities and colleges
 - Non-profit, non-academic organizations
 - For-profit organizations
 - State and local governments
- To whom?
 - Categories of Funding Opportunities
- What?
 - Basics of Proposal Types
- When?
 - Target date, deadline and window

Calls for Proposals

- Program Description (or Announcement)
 - broad, general descriptions of programs
 - invites investigator-initiated, unsolicited proposals
- Dear Colleague Letter
 - provides general information to community, clarifies or amends existing policy or document, or informs community about upcoming opportunities or special competitions for supplements
- Program Solicitation
 - encourages proposals in areas of interest to NSF
 - more focused; limited period of time
 - may include additional review criteria or reporting requirements, budgetary and eligibility limits, letters of intent or pre-proposals

Proposal Submission - What?

- Letters of Intent
 - Only if needed by the program
 - Intent: to help NSF program staff to gauge size and range of competition
 - Contents: PI's and co-PI's names, proposed title, list of possible participating organizations, and synopsis
 - Not externally evaluated or used to decide on funding
- Preliminary Proposal
 - Only if needed by the program
 - Intent: to reduce unnecessary effort in proposal preparation and to increase the overall quality of full submission
 - Contents: based on the program
 - Review and decisions: merit review to aid decisions
 - Invite or Not invite
 - Encourage or Not encourage
- Full Proposal
 - Typical submission to NSF

When?

Target dates

- proposals still accepted, but may miss panel

- Deadline dates

- proposals will not be accepted for review

- Submission Windows

- designated periods of time during which proposals accepted for review

- Accepted any time – After speaking with PD

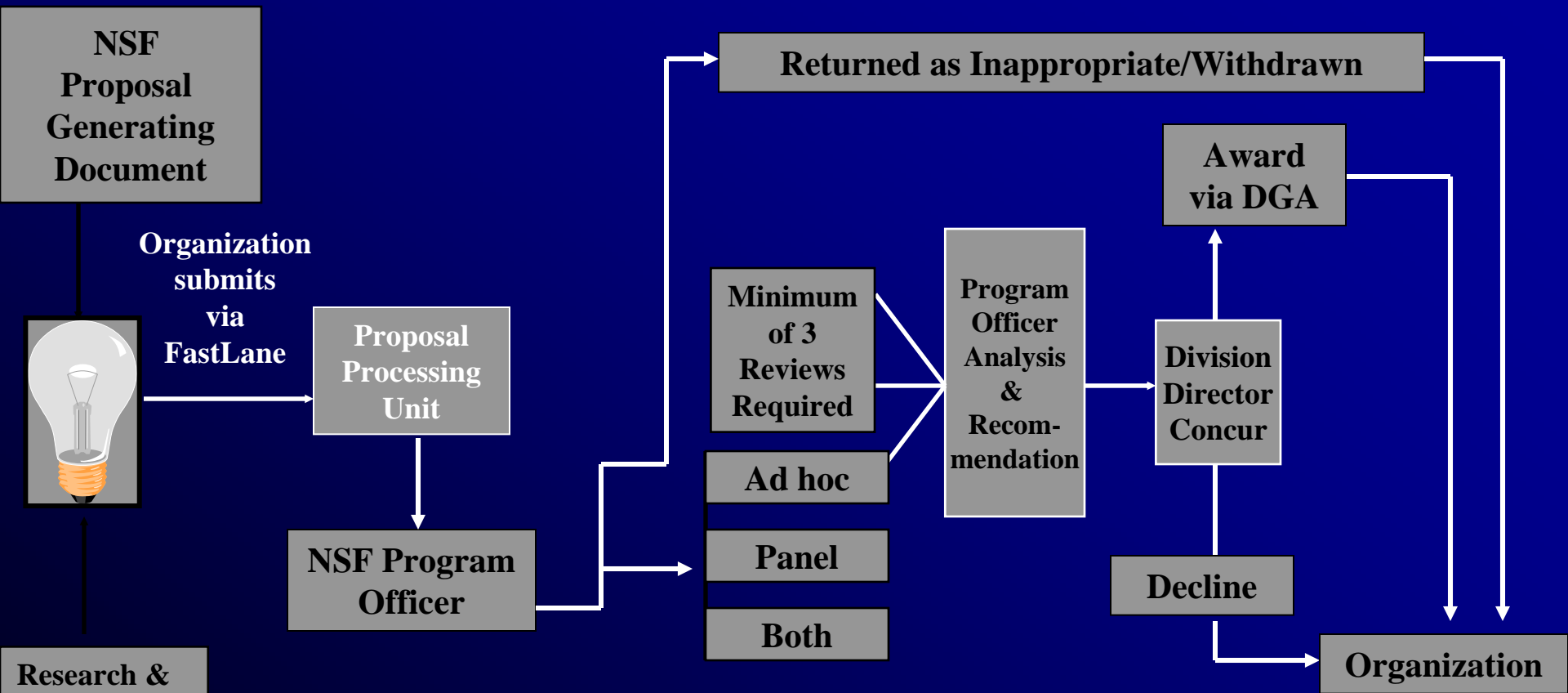
- e.g. SGER (Small Grants for Exploratory Research), conference/workshop proposals, supplements

Merit Review Criteria

- The intellectual merit of the proposed activity
 - Creativity and originality and *transformative potential*
 - Potential to advancing knowledge and understanding within and across fields
 - Conceptualization and organization
 - 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



Proposal Process



Proposal received by NSF

Div. Dir. Concur

Award

90 Days

6 months

30 days

DGA Review & Processing of Award

Proposal Preparation Time

Review of Proposal

P.O. Recommend

DGA Review & Processing of Award

Bases for Decisions

- Innovation, Originality, Creativity
 - High risk/high reward projects
- Breadth of research areas
- Priority areas and systems
- Demographics and diversity
- Broadening participation
- Institutional impact- PUI, EPSCOR, etc.
- Integration of research & education
- International collaborations

Research proposal preparation

A good proposal begins with an original idea that is well expressed, pursues the idea through empirical research or other means, evaluates the findings and makes them known to all who may be interested, and concludes by explaining the broader impacts of the activity.

Writing the Proposal

The Grant Proposal Guide

- Get it - Read it - Follow it
- Proposal preparation and submission
- Submission of **collaborative** proposals via
 - Subaward
 - Separate, linked, proposals
- Review criteria and process
- Return without review criteria
- Withdrawal, declination, and award processes
- Significant award administration procedures

Project Summary

- This one page is critical because it:
 - It may affect which program or panel will review your proposal.
 - It must include a statement addressing both review criteria
- Intellectual Merit
 - Describe the scientific/engineering problem and why it is important
 - State the overall objective & specific aims of the project
 - Describe how the aims will be achieved
- Broader Impacts
 - Educational & outreach activities; infrastructure; dissemination; underrepresented groups; benefit to society

Project Description

15 pages where you will need to cover

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

Project Description

- Know your audience – the reviewers!
- Think about the reviewers
 - **Write accurately, concisely, and clearly**
 - **Make it easy for reviewers to like your proposal**
 - **First page tells it all**
 - **Address issues, don't conceal or skirt them**
 - **Make choices, give reasons**
 - **Figures and tables help**
 - **Some reviewers may not be expert in your specific field**

Biographical Sketch

- Professional Preparation
- Appointments
- Publications
 - 5 closely related
 - 5 other significant publications
- Synergistic activities
- Collaborators & other affiliations
 - Collaborators (last 4 yrs) & co-editors (last 2yrs)
 - Graduate and Postdoctoral Advisors
 - Thesis Advisor and Postgraduate-Scholar Sponsor

Budget

- Budgets should be
 - reasonable, but ask for what you need
 - for personnel, equipment, travel, participant support, & other direct costs for cost of educational activities associated with research, where appropriate
- Unless solicitation specifies otherwise, do not include cost-sharing on Line M
- Justification

Current and Pending Support

- List everything
 - current, pending and anticipated
- Be careful of overlap
 - Perception of overlap could be detrimental in the review.
- Dual submissions
 - when they are allowed



Human Subjects

- No award for a project involving human subjects can be made without prior Institutional Review Board (IRB) approval of the research activity.
- The PI may request Human Subjects evaluation from the IRB of a nearby institution.



Human Subjects

- A tribal community may establish its own Institutional Review Board (IRB) following Federal Policy for the Protection of Human Subjects, Subpart A: The Common Rule for the Protection of Human Subjects (45 CFR 690)

<http://www.nsf.gov/bfa/dias/policy/docs/45cfr690.pdf>

Why do some proposals fail?

- Absence of innovative ideas or hypothesis
 - Will provide only an incremental advance
 - Not exciting or cutting edge
- Vagueness
 - 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

If you have to resubmit...

- Stay calm!
 - Take ten... breaths, hours, days
 - Examine the criticisms carefully
 - Call, email or visit your program director
- Think carefully about rapid resubmission:
 - Take time to self-evaluate the proposal and the project

Funding and afterwards

- Funding
 - Budget and scope may be part of negotiations prior to making an award.
 - Funding mechanisms may be as a standard (all \$ at once) or continuing (\$ released annually) grant.
- Afterwards
 - Do what you promised (*pretty much*)
 - Notifications & Requests via FastLane
 - Supplement opportunities
 - REU - Research Experience for Undergraduates
 - ROA - Research Opportunity Awards
 - RET - Research Experience for Teachers
 - Submit annual and final reports

A closing word of advice

- "You miss all the shots you don't take."

Wayne Gretsky