

Grant Proposal Development Workshop

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Overview

- **Types of Proposals**
- **Proposal Development Tips**
- **General Funding Agency Information**
- **NSF-specific Information**
- **Mock Panel**

Types of Proposals

- **Research**
 - SIRP
 - Multi-investigator
- **Research Infrastructure**
- **Education**
 - Curriculum Development
 - Educational Innovation
- **Special Projects, SGER, Travel, Workshops, Postdoctoral Fellowships, etc.**
- **Supplements – standard, REU, RET**
- **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 workshops**
 - Help set future trajectories
- **Serve on panels**
 - Read lots of proposals
 - Good citizenship

Cindy's Tips (1)

- **Have I done a good job in the first page of explaining what I want to do and why it is important, in a way that the typical reader can understand? this has to be both readable and interesting, and directed to the mission of the funding agency.**
- **Did I spend the right amount of space on the various aspects of what I'm proposing...intro, history, research plan, etc.? And, does it make sense as a narrative, and read well?**
- **Did I reference the right people? particularly likely reviewers**
- **Is my proposal understandable to the probable reviewers? Is it at the right technical level?**
- **Did I show why I am the right person to do this work? (prior results, how this relates to my earlier work)**

Cindy's Tips (2)

- **Did I include a plan to evaluate or assess my results? this is essential for some kinds of proposals**
- **Is there an educational component beyond the usual grad student involvement? (depending on the funding agency) for some agencies, this is a big plus**
- **If there are issues this agency particularly looks at, have I addressed them?**
- **Does my proposal look professional? Well formatted, nice diagrams, correct spelling and grammar**
- **Did I follow all the rules and suggestions in the RFP?**
- **Does my budget make sense in terms of being proportional to the amount of work I'm proposing to do? Did I ask for everything I reasonably could without going overboard?**

Tips (1)

- **Never submit a paper as a proposal**
- **Project Description**
 - **Must propose a new idea**
 - **Distinguish between research and development**
 - **Make the research challenges and goals explicit**
 - **Make your methodology explicit**
 - **Support your motivation section with at least one good example or application**
 - **Acknowledge the areas of high and low risk as well as the associated rewards**
 - **Purpose of a software artifact is to support the research**
 - **Iterate with non-participating colleagues to get pre-proposal review**

Tips (2)

- Objectively assess the work of competitors and place in proper perspective (“on the shoulders of giants ...”)
- Avoid pejorative terms in describing competitor’s work
- Cite all of the relevant work
 - journal and conference papers (yes-yes)
 - Textbooks are generally a no-no; monographs okay
- Avoid fallacious arguments
- Be clear that early prototypes and experiments do not indicate that the work has already been done
- Avoid excessive detail. Succinctness gets rewarded.
- Budget your space. A one-quarter-page diagram should replace a page of text

Tips (3)

- Avoid such terms as “obvious”, “trivial”
- Develop a well-defined evaluation and dissemination plan
 - Include assessment experts if necessary
- Include text on technical merit and broader impacts of your proposed work – why it is good and whom it will impact
- Explain leverage of existing facilities, equipment and other support for the project
- Obtain all relevant letters of support and required documents
- If CAREER develop a research program vs. a research project
- If CAREER develop an education plan

Tips (4)

■ **Project Summary**

- **Write it last, spend as much time as you did on the project description**
- **Get your new idea into the first 50 words**
- **Give a taut summary of the problem, your research plan and what you hope to achieve**
- **Must include a succinct description of technical merit and broader impacts**
- **Iterate many times as the summary is an important bifurcation point**

Agencies and Foundations

■ **Federal Agencies**

- **National Science Foundation (NSF)**
- **DARPA (DoD)**
- **NIST (DoC)**
- **ARO, ONR, AFOSR (DoD)**
- **NASA**
- **DoED**

■ **Private Foundations**

- **Sloan, Ford, Pew, Keck, HP, Intel, Honda, ...**

NSF's Mission

- <http://www.nsf.gov/about/glance.jsp>

The National Science Foundation (NSF) is an independent federal agency created by Congress in 1950 "to promote the progress of science; to advance the national health, prosperity, and welfare; to secure the national defense..." With an annual budget of about \$5.5 billion, we are the funding source for approximately 20 percent of all federally supported basic research conducted by America's colleges and universities. In many fields such as mathematics, computer science and the social sciences, NSF is the major source of federal backing.

NSF Organizational Structure (1)

- **National Science Board**
 - **Office of the Director (Director)**
 - **Directorates (Assistant Director)**
 - **Divisions (Division Director)**
 - **Programs (Program Officer, Program Director)**

NSF Organizational Structure

(2)

■ **Director's Office (OD)**

– **Dr. Arden Bement**

■ **Directorates**

– **Biological Sciences (BIO)**

– **Computer Information Science and Engineering (CISE)**

– **Engineering (ENG)**

– **Geosciences (GEO)**

– **Math & Physical Sciences (MPS)**

– **Social, Behavioral, Economic Sciences (SBE)**

– **Education and Human Resources (EHR)**

Office of Cyberinfrastructure

- **In June 2005 the SCI Division of CISE was disbanded and the Office of Cyberinfrastructure was created in the Office of the Director**
- **Approximately \$70M of budget**

NSF and CISE Budgets

- NSF's budget has grown from about \$3B in 1994 to almost \$6B in 2005
- CISE's budget has grown from about \$200M in 1994 to about \$600M in 2005
- The funding rate for NSF has dropped from about 33% in 1994 to about 25% in 2004
- The funding rate for CISE has dropped from about 36% in 1994 to about 16% in 2004
- Average annual CISE award size has grown from about \$72K in 1994 to about \$152K in 2004

Funding Rate Computation

- **Not well-defined**
- **Supplements**
- **Amendments**
- **Multi-proposal collaborative projects**

CISE Reorganization

- **CISE reorganized in 2004 in order to address a number of issues:**
 - Increase in proposals submitted
 - Falling funding rate
 - Constant staff size
 - Proliferation of Programs
 - More NSF-wide programs
 - New initiatives

CISE Divisions

- **Computing and Communications Foundations (CCF) (DD: Michael J. Foster)**
<http://www.nsf.gov/div/index.jsp?div=CCF>
- **Computer and Network Systems (CNS) (DD: Wei Zhao)**
<http://www.nsf.gov/div/index.jsp?div=CNS>
- **Information and Intelligent Systems (IIS) (DD: Michael J. Pazzani)**
<http://www.nsf.gov/div/index.jsp?div=IIS>

CCF Programs

- **Theoretical Foundations Cluster**
- **Foundations of Computing Processes and Artifacts Cluster**
- **Emerging Models and Technologies for Computation Cluster**

- **Program Synopsis**
- **Program Solicitation**
- **Abstracts of Recent Awards**
- **Program Officers**

CNS Programs

- **Computer Systems Cluster**
 - **Computing Research Infrastructure Cluster**
 - **Network Systems Cluster**
 - **Education and Workforce Cluster**
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- **Program Synopsis**
 - **Program Solicitation**
 - **Abstracts of Recent Awards**
 - **Program Officers**

IIS Programs

- **Data, Inference and Understanding Cluster**
- **Science and Engineering Informatics Cluster**
 - Collaborative Research in Computational Neuroscience
 - Science and Engineering Information Integration and Informatics
- **Systems and Context Cluster**
 - Advanced Learning Technologies
 - Information and Intelligent Systems
- **Program Synopsis**
- **Program Solicitation**
- **Abstracts of Recent Awards**
- **Program Officers**

CISE Emphasis Areas

- **Broadening Participation in Computing**
- **Cyber Trust**
- **Cyberinfrastructure TEAM (CI-TEAM):
Demonstration Projects**
- **DDDAS: Dynamic Data Driven Applications
Systems**
- **Science and Engineering Information
Integration and Informatics**
- **Science of Design**
- **Software and Tools for High-End Computing**

NSF Wide Programs

- **Faculty Early Career Development (CAREER) Program**
- **Major Research Instrumentation Program (MRI)**
- **Research Experiences for Undergraduates (REU)**
- **Research in Undergraduate Institutions (RUI)**

Recently Announced Programs

- **Broadening Participation in Computing (BPC)
(NSF 05-562)**
- **Information and Intelligent Systems
(NSF 05-551)**
- **Cyber Trust (NSF 05-518)**
- **Science and Engineering Information,
Integration and Informatics (NSF 04-528)**
- **Collaborative Research in Computational
Neuroscience (NSF 04-514)**

GENI Initiative

The End