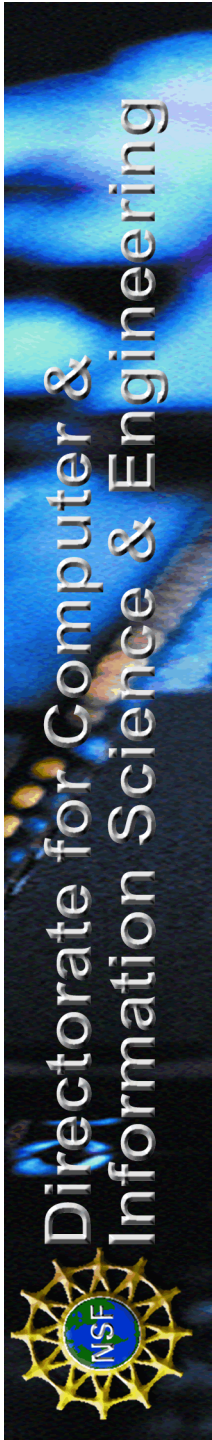




**Timothy 6:10: For the love of money is the root of all evil: which while some coveted after, they have erred from the faith, and pierced themselves through with many sorrows.**



# **NSF Perspectives for CRA**

**Michael Foster**  
**Division Director**  
**Computing and Communication**  
**Foundations**

# Outline

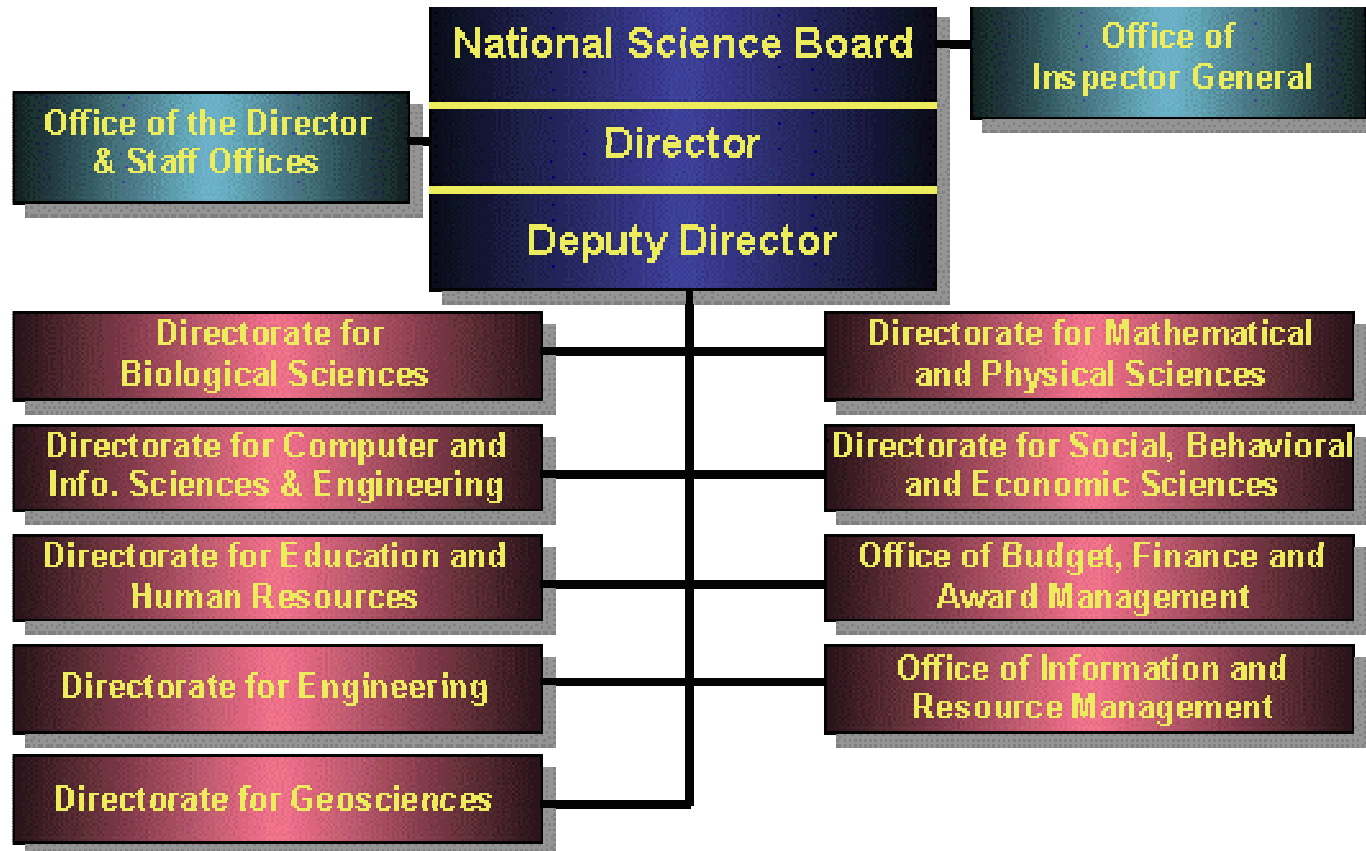
- **Context**
  - NSF and CISE Organizations
  - Budget history
- **FY07 Emphases**
- **Looking ahead**
- **The Want Ads**



# A Word on DARPA

- **99% of life is showing up. You need:**
  - **An idea**
    - **With a tech-transfer path**
  - **2-4 years to devote**
  - **Willingness to sell**
    - **Your interview is a program pitch**

# National Science Foundation





# CISE Mission

- **CISE has three goals:**
  - to enable the United States to remain competitive in computing, communications, and information science and engineering;
  - to promote understanding of the principles and uses of advanced computing, communications, and information systems in service to society; and
  - to contribute to universal, transparent, and affordable participation in an information-based society.



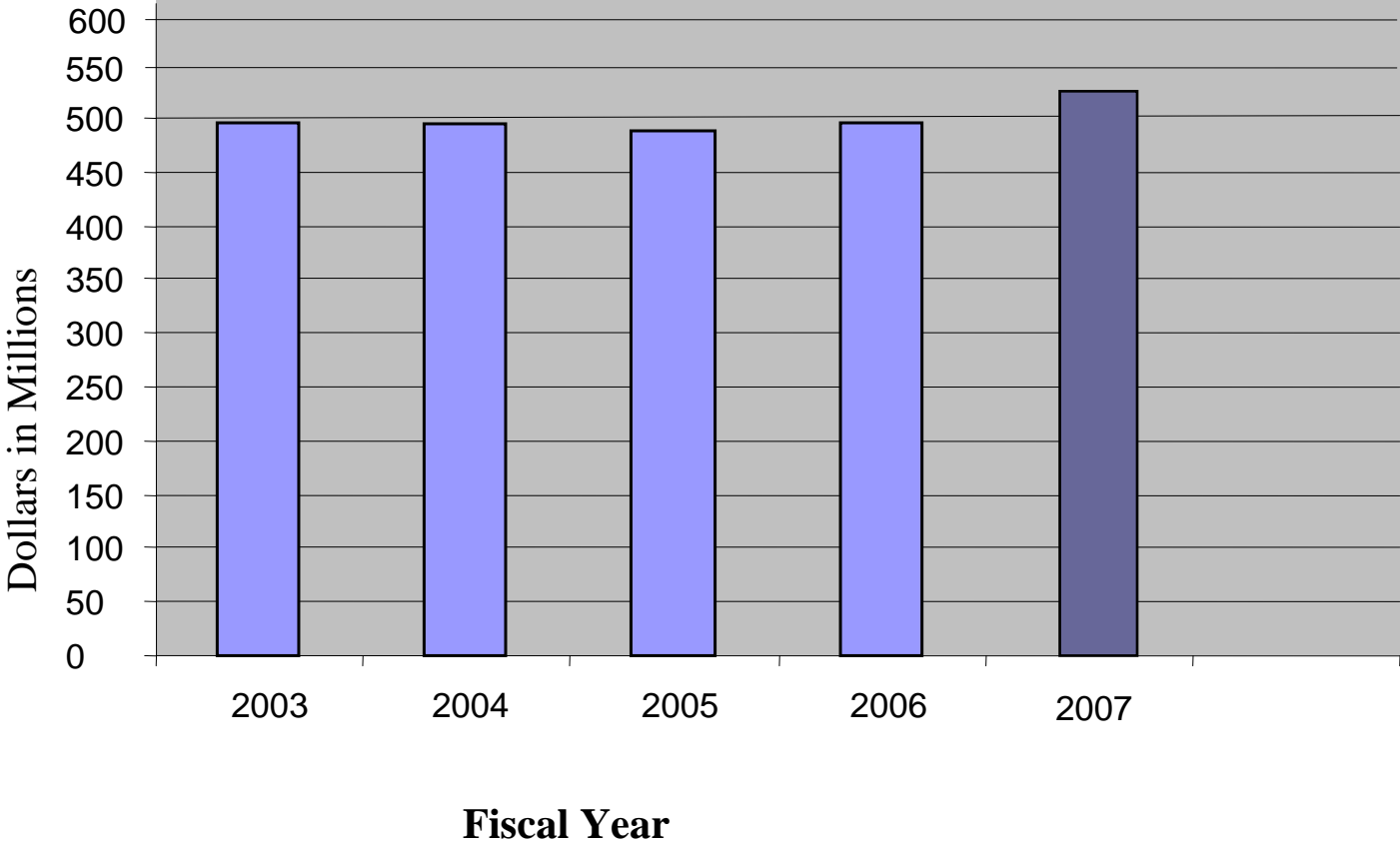
**CISE provides 86%  
of all Federal support for  
computer science research**

# Federal Research Challenges

- **Priorities**
  - Convince US public to pay for research
- **Balance**
  - Long-range research focus
  - Year-to-year funding focus
- **Community fragmentation**
  - Move from zero-sum game to positive game



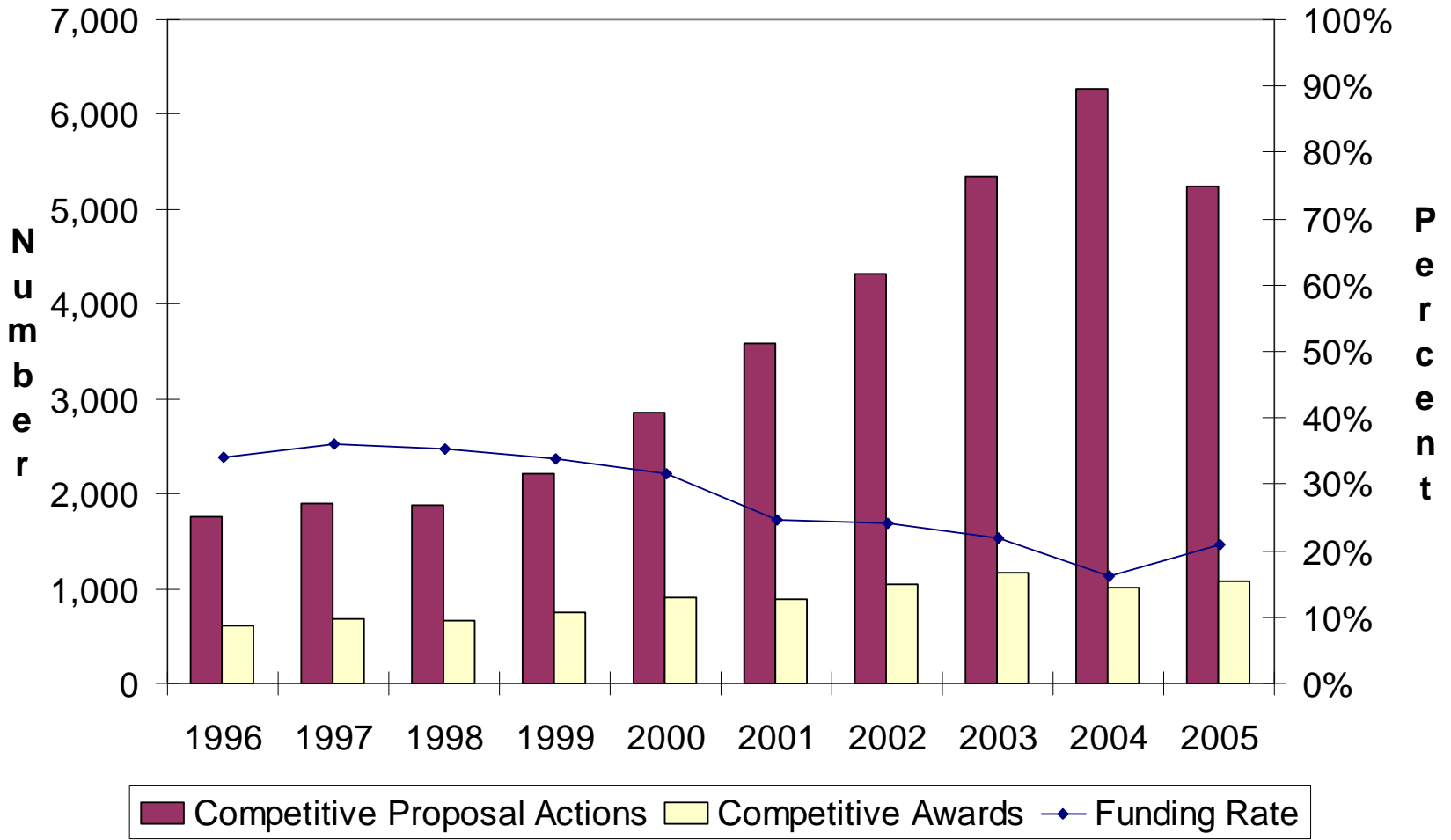
# CISE Budget 2003-2007



# Managing Slow Growth

- **Concentrate on the core**
- **Gradually climb out of the hole**
  - Slow some proposal cycles
  - Decrease future-year commitments
- **Propose new budget initiatives**
  - FY07 and FY08 look good for CISE

## Funding Rate for Competitive Awards in CISE





# FY07 Emphases

# Global Environment for Networking Innovations (GENI)

- **A research program**
  - Go beyond packets and datagrams
  - Design in security, availability, variability
  - Deploy and validate new architectures
  - Develop new network architecture theory
- **A facility**
  - Meeting the high-level goals of modularity, opt-in, connectedness, and measurability
  - Suitable for support through MREFC
- **Guides CISE programs**
  - SING, FIND in FY06
  - Facility planning in FY07



# Geni Facility Planning

- **Planning website at [www.geni.net](http://www.geni.net)**
- **Planning Group: About 10 networking researchers**
- **Working Groups**
  - **Backbone Network**
  - **Distributed Services**
  - **Wireless Subnets**
- **NSF/CISE will sponsor further planning through the Computing Community Consortium**
  - **Proposals are in; under review**

# Continuing Emphases

- **Cybersecurity and Cybertrust**
- **Science of Design**
- **Broadening Participation in Computing**

# FY07 Think Piece

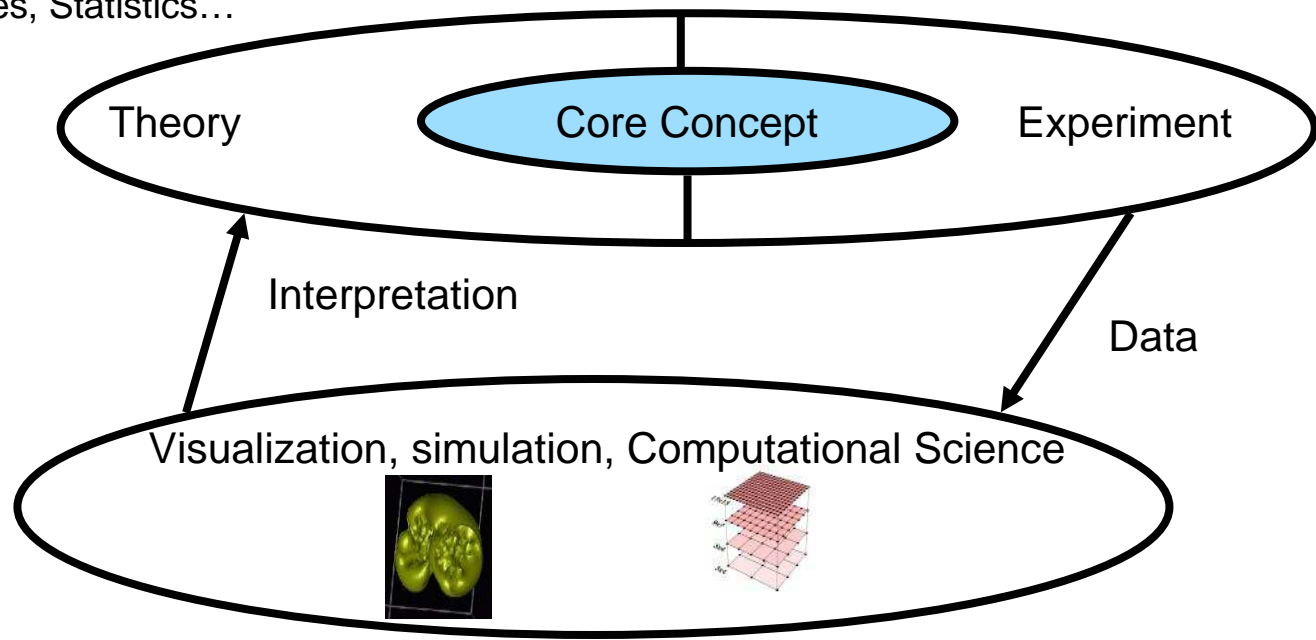
- **Your Strategic Directions**
- **What (few) large (5-30 million \$) projects should we start?**

# Beyond FY07

- **Outreach**
  - U.S. Public
  - Other disciplines
  - Tech transfer targets
- **Grand visions – think big**
  - Due date for FY09: April 2007
  - Computational discovery
  - Our socio-cyber world
  - WHAT ELSE???

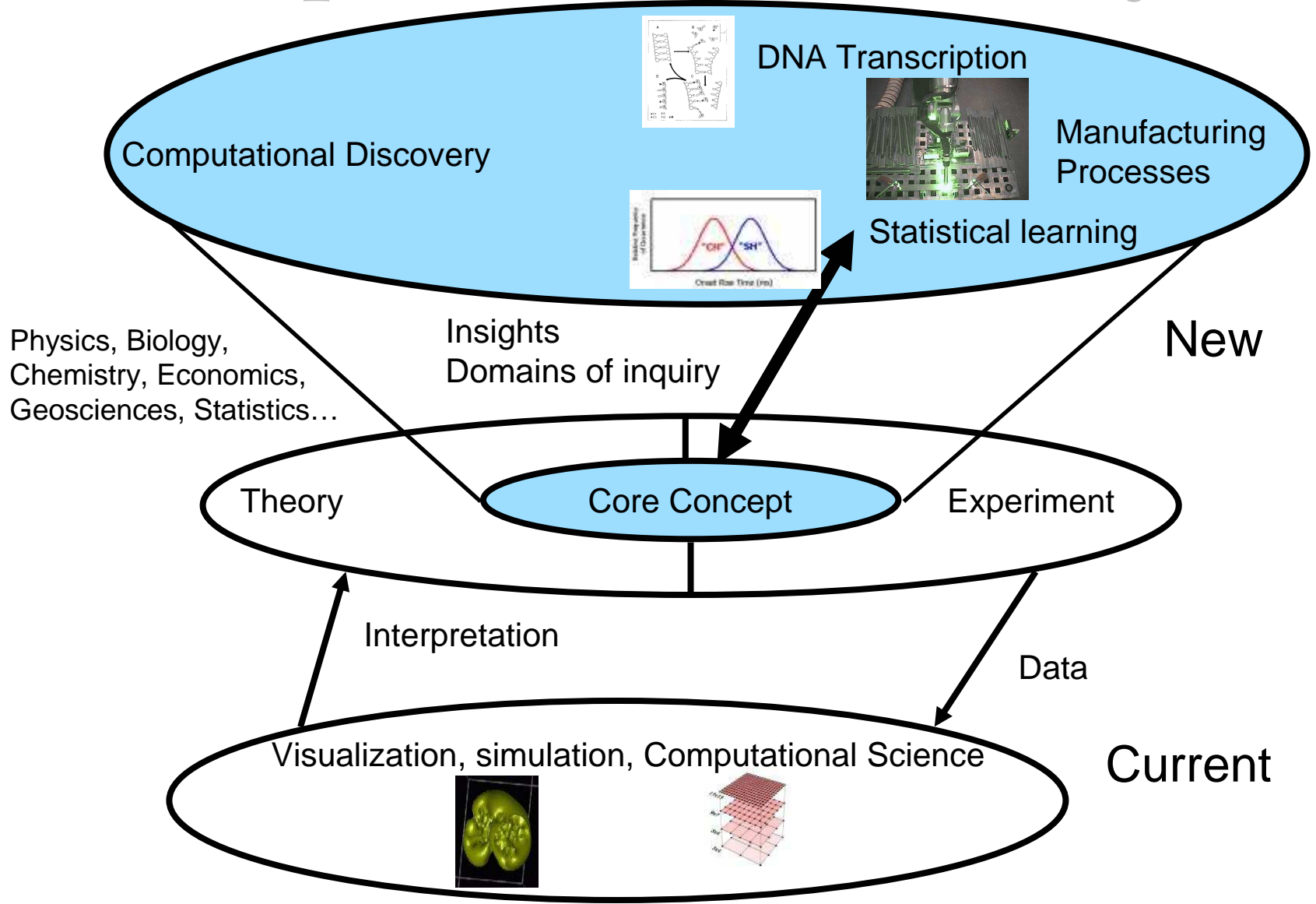
# Computational Science and ITR

Physics, Biology,  
Chemistry, Economics,  
Geosciences, Statistics...





# Computational Discovery



# Conclusions

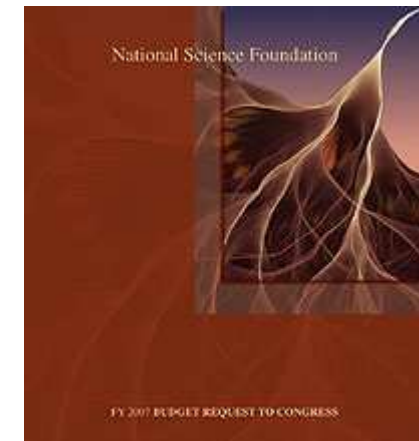
- **NSF investment is vital to our nation's future**
- **Think long-term**
- **Think big**
- **Act in cooperation**



# The Want Ads

# Nuggets

- **Convince the US public that research is worth paying for**
- **Succinct, interesting vignettes**
  - Show a result, not an expense
  - Layman's language
  - Graphics if possible
- **NSF Uses the best ones**
  - Budget requests
  - Performance reports
  - Public relations



# Help from the Community

- **Send your best ideas to NSF**
  - Consistent with focus & goals of the program
  - We want high risk / high reward proposals
- **Suggest and encourage good panelists who can do justice to the proposals and our focus**
- **Volunteer to be a reviewer and panelist**



# Program Directors Sought

- **Software Engineering**
- **Numerical Computing and Optimization**
- **Interdisciplinary capability**
  - **Across cluster, division, NSF, and globally**

# Contact

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**Division Director, Computing and  
Communication Foundations**

**National Science Foundation**

**4201 Wilson Boulevard**

**Suite 1115**

**Arlington, VA 22230**

**703-292-8910**

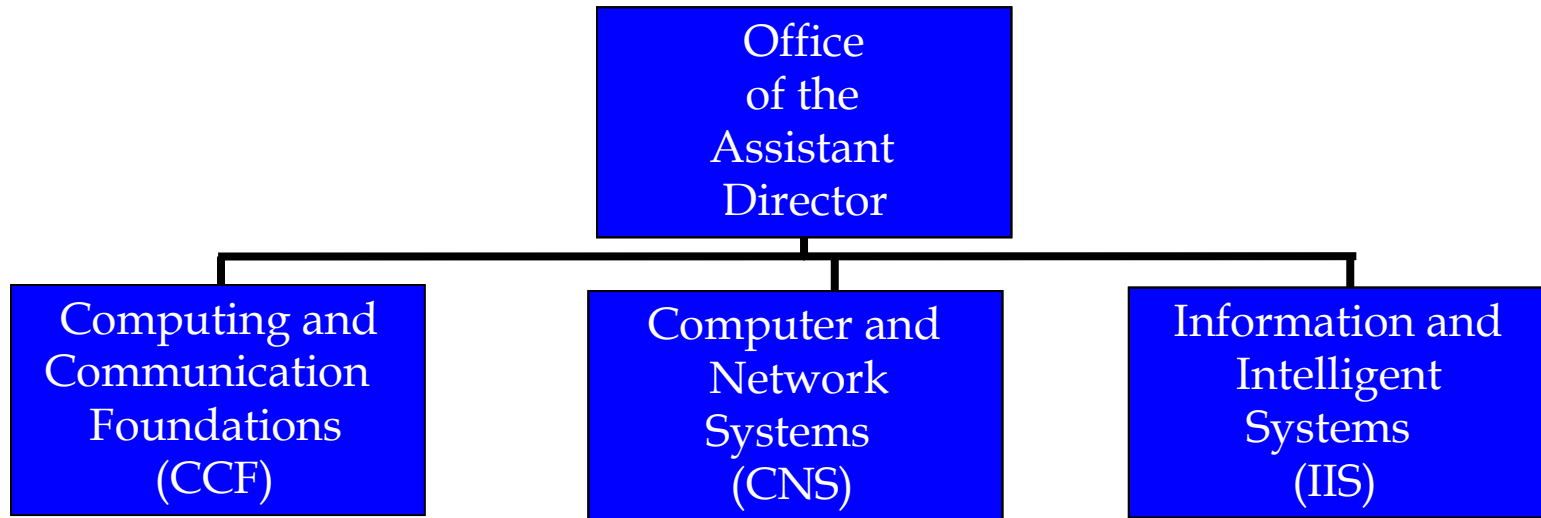
**[mfoster@nsf.gov](mailto:mfoster@nsf.gov)**





# Backups

# Current CISE Organization



**Crosscutting Emphasis Areas**



# Computing and Communication Foundations Division (CCF)

- **Theoretical Foundations**
  - Computer science theory; numerical computing; computational algebra and geometry; signal processing and communications; theory of networking
- **Foundations of Computing Processes and Artifacts**
  - Software engineering; software tools for HPC; programming languages; compilers; computer architecture; graphics and visualization, design automation
- **Emerging Models and Technologies for Computation**
  - Computational biology; quantum computing; nano-scale computing; biologically inspired computing



# Why Foundations?



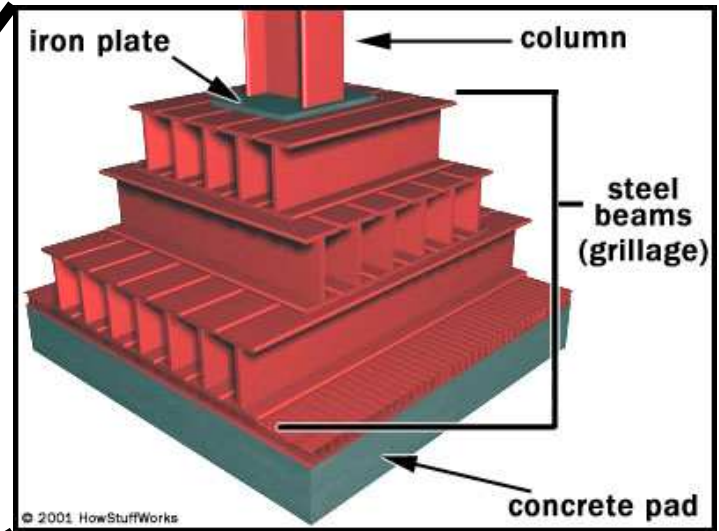
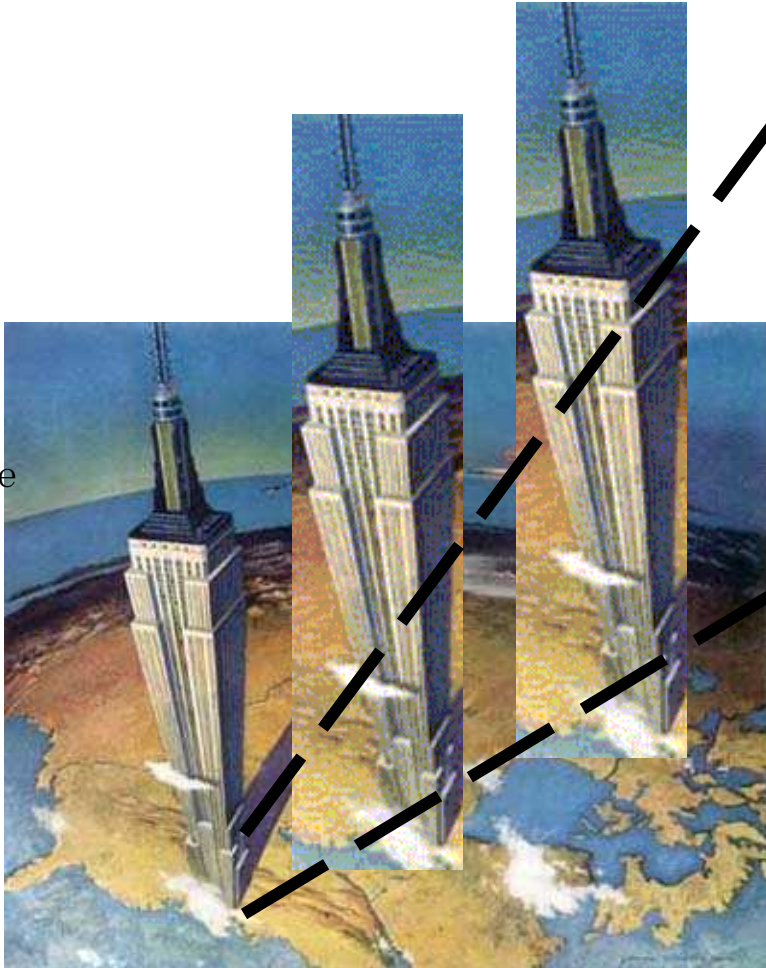
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# Foundations Everywhere





# Computer and Network Systems Division (CNS)

- **Computer Systems**
  - Distributed systems; embedded and hybrid systems; next-generation software; parallel systems
- **Network Systems**
  - Networking research broadly defined plus focus areas
- **Computing Research Infrastructure**
  - Equipment and infrastructure to advance computing research
- **Education and Workforce**
  - IT workforce; special projects; cross-directorate activities (e.g., REU sites, IGERT, ADVANCE)

# Information and Intelligent Systems Division (IIS)

- **Human-Centered Computing**
  - The study of unprecedented IT and their interface to humans: grid computing, wearable computing, agent technologies, multi-player games, multi-modal interfaces, affective computing, e-commerce
- **Information Integration and Informatics**
  - Digital Government
  - Digital Libraries and Archives
  - Information, Data, and Knowledge Management
  - Science and Engineering Information Integration and Informatics
- **Robust Intelligence**
  - Computational understanding and modeling of the many human and animal capabilities that demonstrate intelligence and adaptability in unstructured and uncertain environments

# *CISE FY 2007 Budget Request to Congress*

The CISE FY 2007 Request totals \$526.69 million, an increase of \$30.28 million, or 6.1 percent, over the FY 2006 Current Plan of \$496.41 million.

Major highlights are:

- \$20.0M increase for Cybersecurity, \$10.0M of which is for Cyber Trust.
- \$10.0 million for design & pre-construction development of the Global Environment for Networking Innovations (GENI).