

Spring 2009 Update

Directorate for Engineering

Thomas W. Peterson

Assistant Director for Engineering

April 22, 2009



Spring 2009 Meeting Focus

- Partnerships
 - Key role(s) of partnerships
 - With industry
 - With other governmental agencies
 - How to improve/expand
- Evaluation of our investments
 - Status report on prior evaluations
 - How to regularize the *process*



ENG Update

- New ENG staff
- Budget and trends
- Presidential initiatives and priorities
- Vision for ENG
- AdCom business

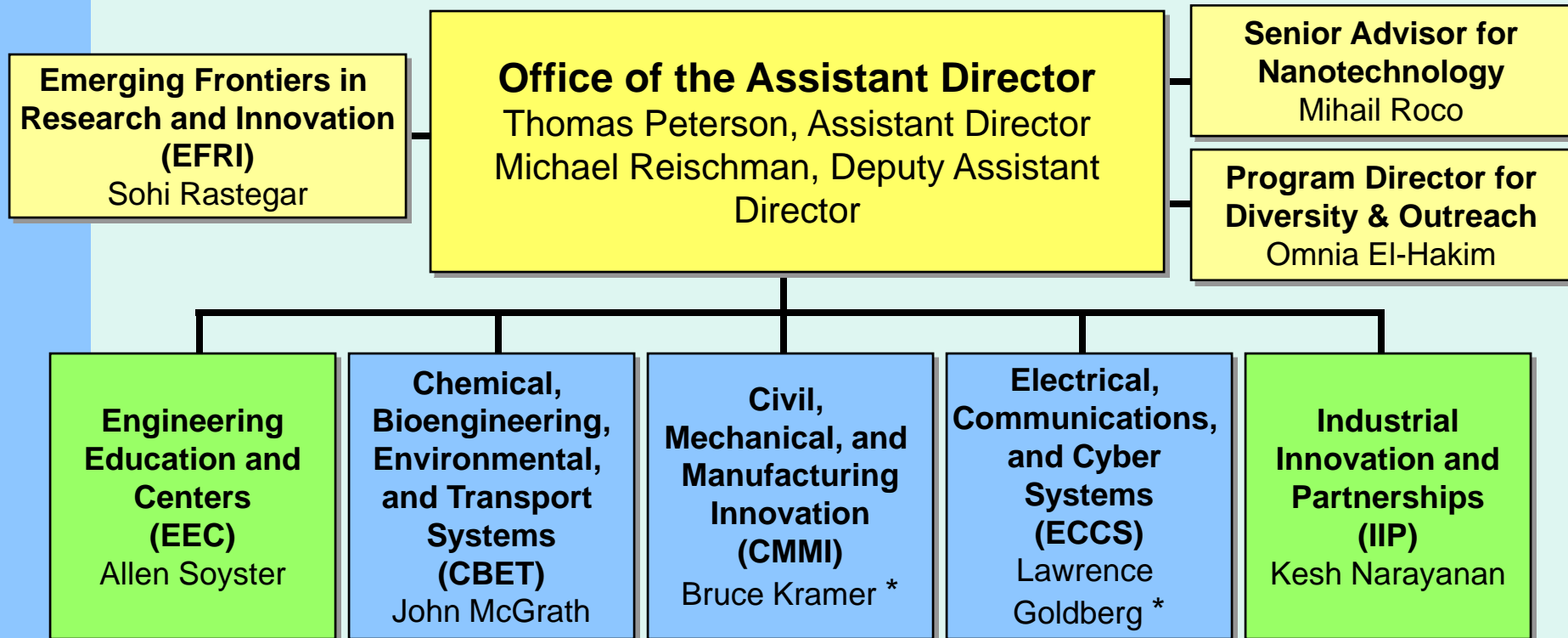


ENG Update

- **New ENG staff**
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Directorate for Engineering (ENG)



* Acting



CMMI

- **Christina Bloebaum**, Program Director for Engineering Design and Innovation, State University of New York at Buffalo
- **Michael Kim**, Science Assistant
- **Michelle Wood**, Program Assistant



CBET

- **Tiffany Boyd, Program Assistant**



ECCS

- **Darryell Fortier**, Division Secretary
- **Aaron Jenkins**, STEP Student
- **Pinaki Mazumder**, Program Director for Power, Controls, and Adaptive Networks, University of Michigan
- **Emily Miller**, Science Assistant
- **Robert Trew**, Division Director, North Carolina State University, as of May 26



IIP

- **Elena Hillenburg**, SCEP Program Specialist Trainee
- **Amanda May**, Program Support Manager



OAD Staff

- **Thomas Peterson**, Assistant Director for Engineering, University of Arizona
- **Omnia El-Hakim**, Program Director for Diversity and Outreach, Colorado State University
- **Christine Lottes**, Science Assistant



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Budget and Trends

- FY 2009 Budget
- American Recovery and Reinvestment Act (ARRA)
- FY 2010 NSF Budget
- Proposal pressures and trends



Simultaneously Coordinating Three Budgets

- FY 2009
 - Omnibus passed in March
 - NSF Directorate details pending
- American Recovery and Reinvestment Act (ARRA)
 - Bottom line passed in March
 - NSF Directorate details pending
- FY 2010 budget request from President anticipated in May



NSF Research and Related Activities (R&RA)

	FY 2008 Actual	FY 2009 Request	Amount Change	Percent Change
Biological Sciences	\$611.49	\$675.06	\$63.57	10.4%
Computer and Information Science and Engineering	534.07	638.76	104.69	19.6%
Engineering (includes SBIR/STTR)	636.32	759.33	123.01	19.3%
Geosciences	752.01	848.67	96.66	12.9%
Mathematical and Physical Sciences	1,166.30	1,402.67	236.37	20.3%
Social, Behavioral, and Economic Sciences	214.94	233.48	18.54	8.6%
Office of Cyberinfrastructure	185.17	220.08	34.91	18.9%
Office of International Science and Engineering	41.30	47.44	6.14	14.9%
U.S. Polar Research Programs	442.22	490.97	48.75	11.0%
Integrative Activities	236.17	276.00	39.83	16.9%
Arctic Research Commission	1.47	1.53	0.06	4.1%
Total, R&RA	\$4,821.46	\$5,593.99	\$772.53	16.0%



Dollars in millions. Totals may not add due to rounding.

NSF Budget

NSF	FY 2008 Actual	FY 2009 Request	FY 2009 Omnibus
Total	\$6.065	\$6.854	\$6.490
Change over FY 2008	---	13.0%	7.0%

Dollars in billions



FY 2009: A Good Year for R&RA

NSF	FY 2008 Actual	FY 2009 Omnibus	ARRA
Total	\$6.065	\$6.490	\$3.000
R&RA	\$4.821	\$5.183	\$2.500

Dollars in billions



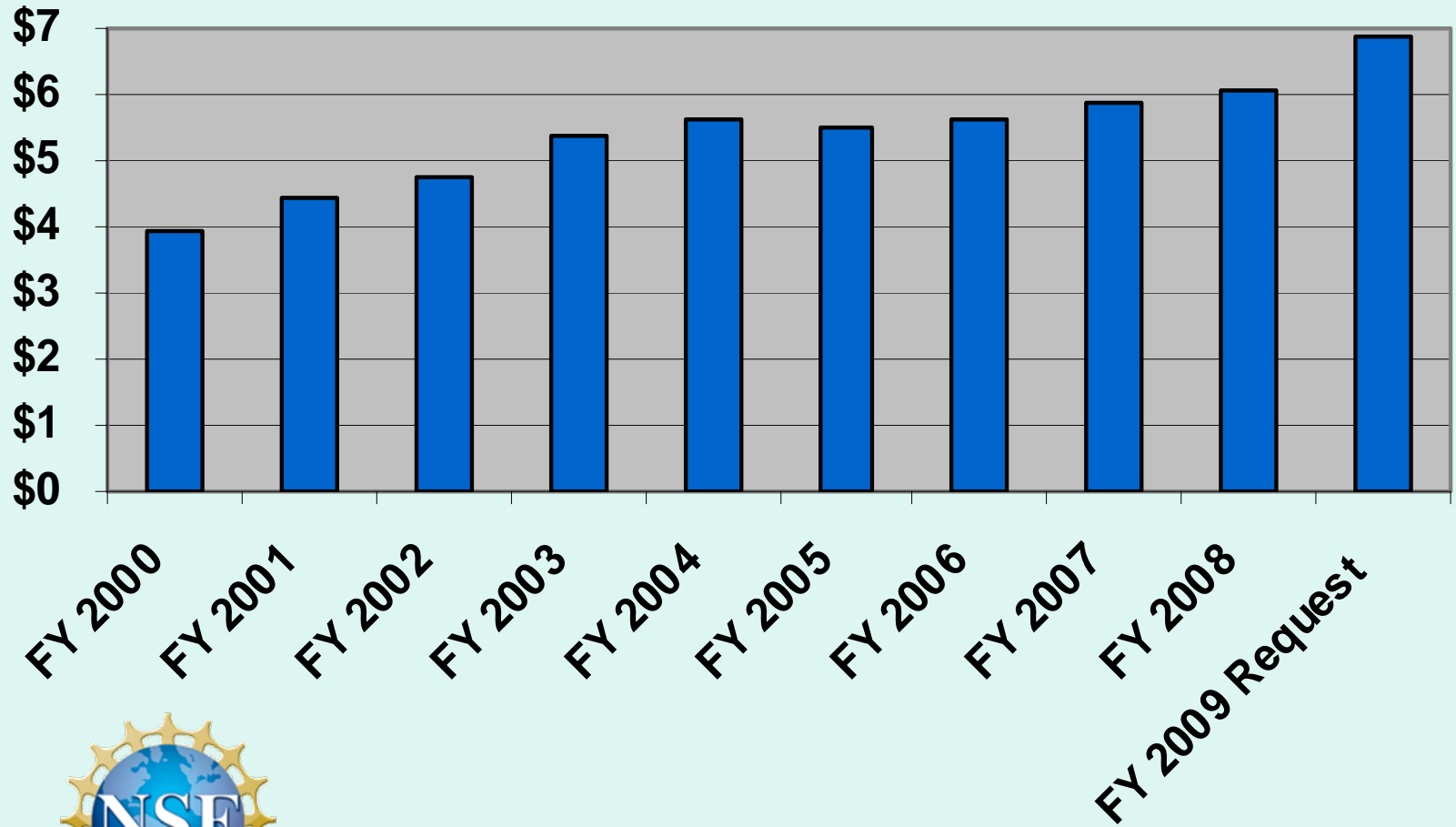
NSF Budget Summary

NSF	FY 2008 Actual	FY 2009 Omnibus	FY 2009 plus ARRA	FY 2010 Request
Amount	\$6.065	\$6.490	\$9.492	\$7.045
Change over FY 2008	--	7.0%	56.5%	16.2%

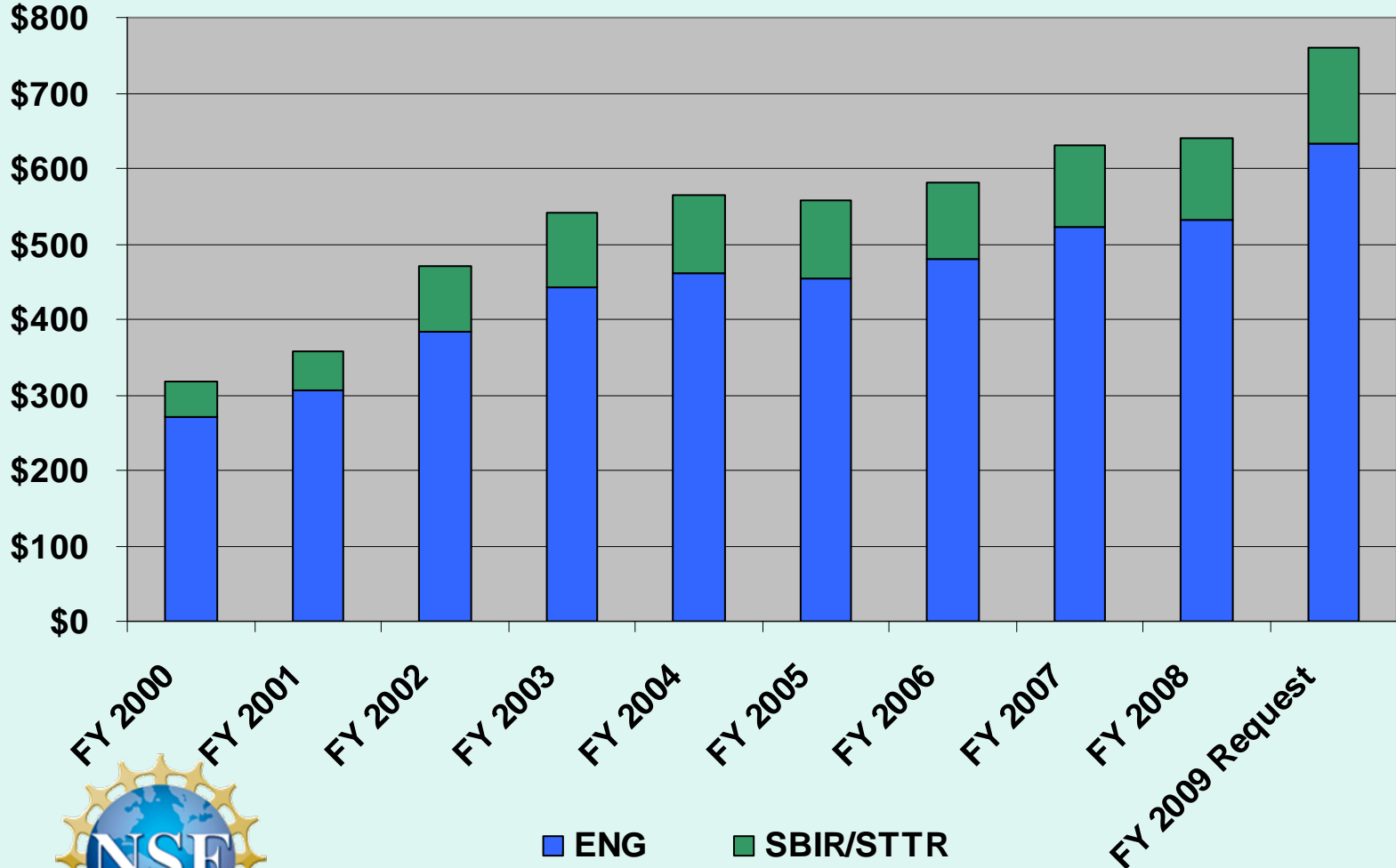
Dollars in billions



NSF Budget (\$B)



ENG and SBIR/STTR Budgets (\$M)

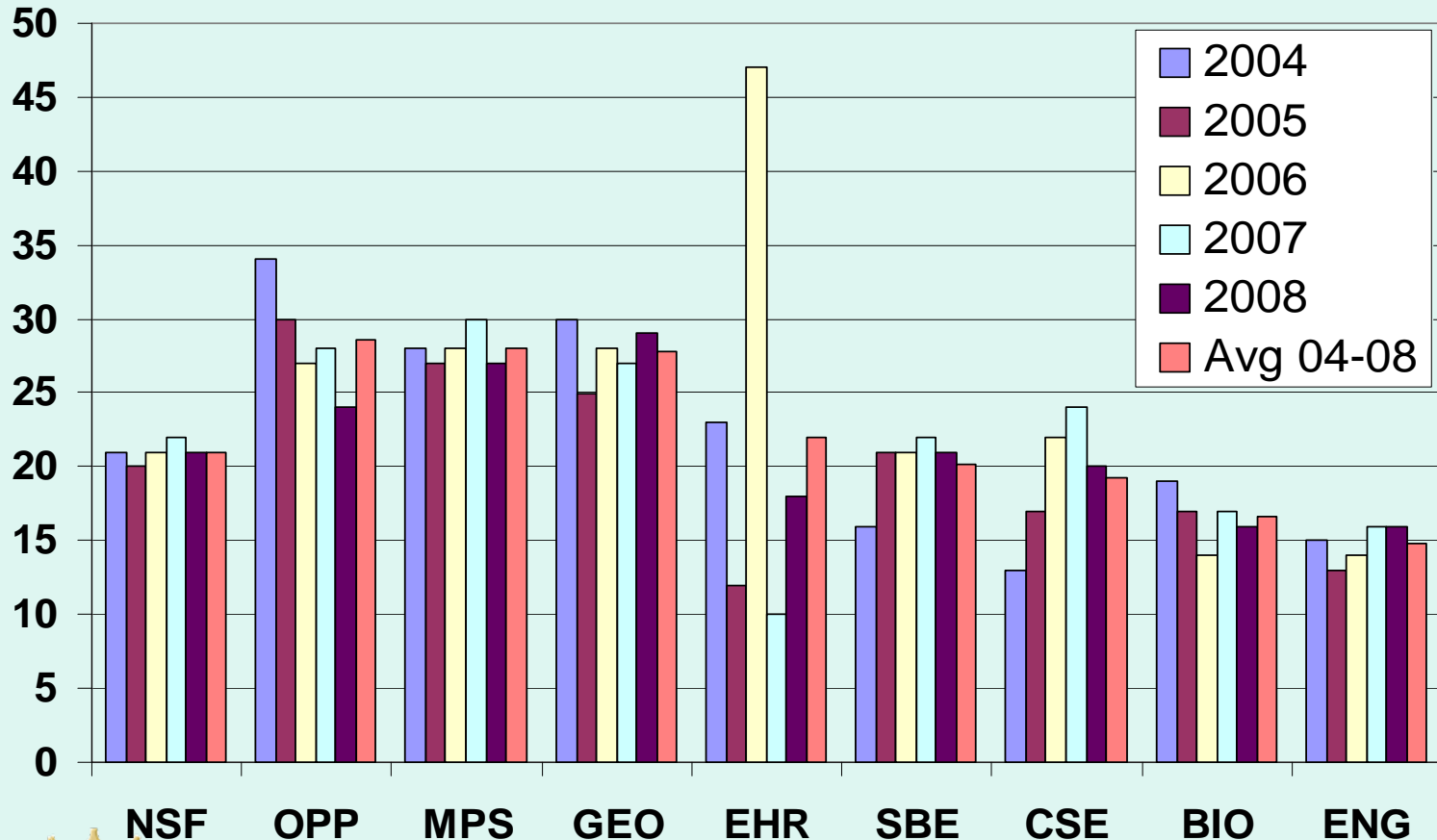


■ ENG

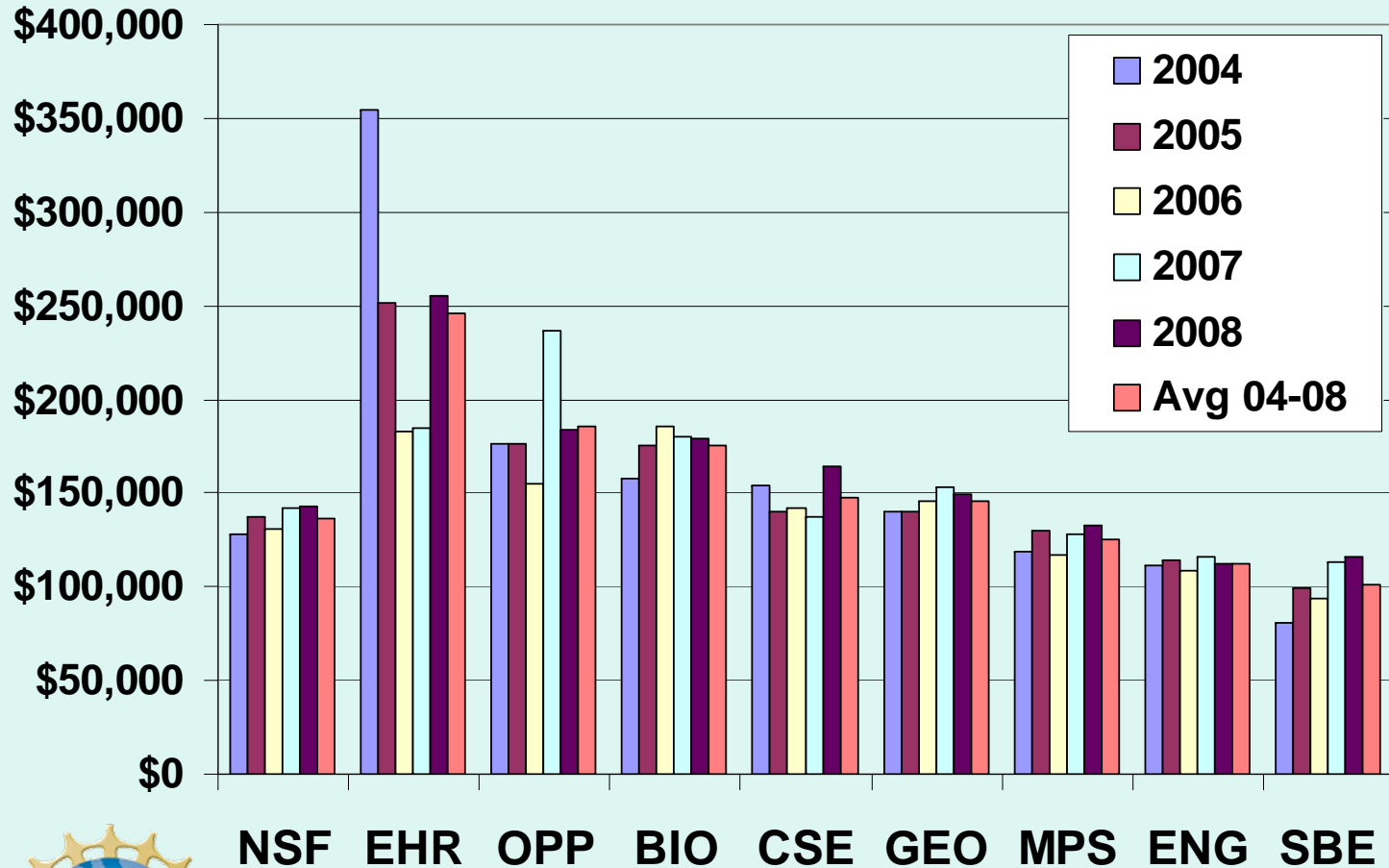
■ SBIR/STTR

Directorate for Engineering

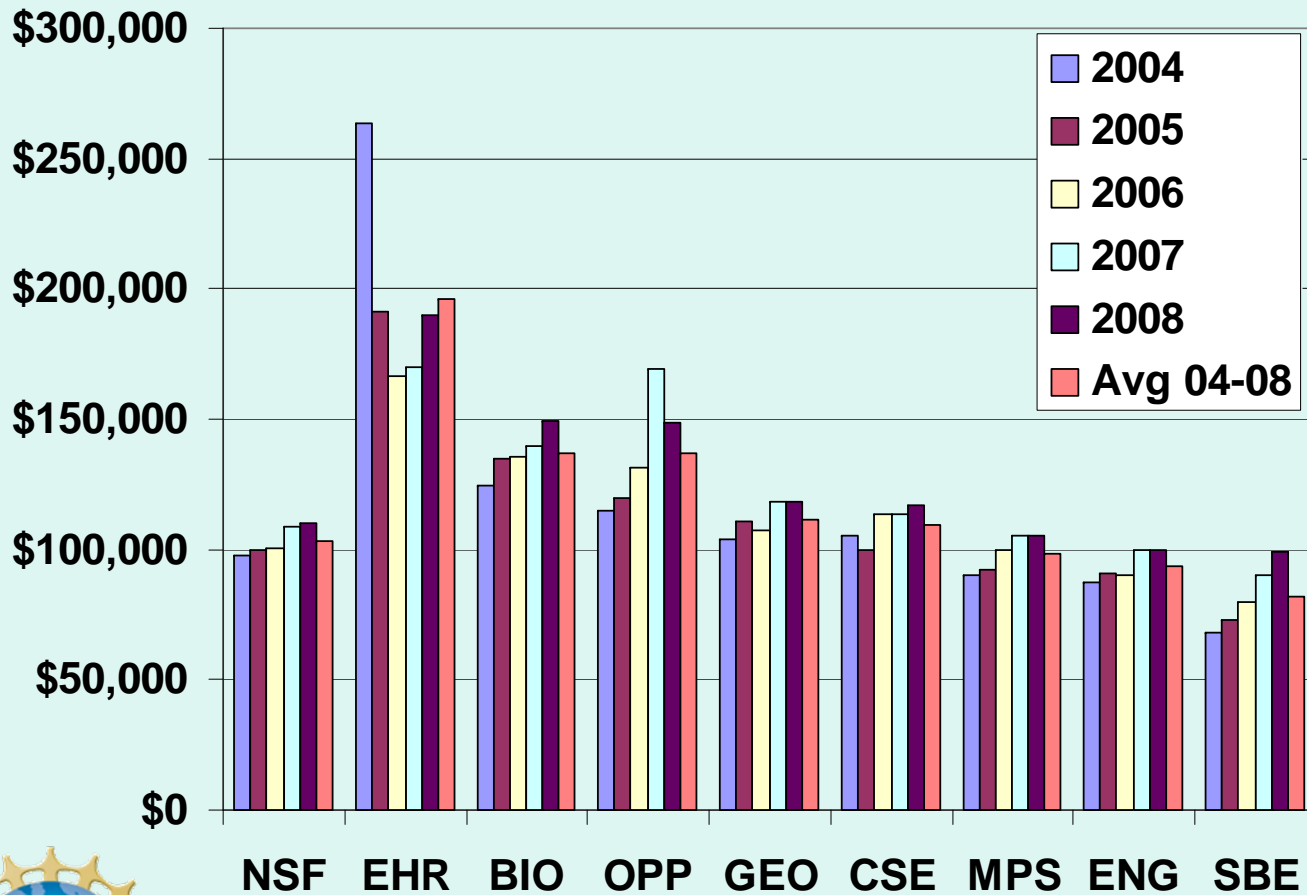
Funding Rates for Competitive NSF Awards



Mean Award Size, 2004-2008



Median Award Size, 2004-2008



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Presidential Priorities for NSF

- Energy and climate
- Accelerating innovation
- Cyber-infrastructure
- Convergence of biology and the physical sciences/engineering
- Crosscutting priorities
 - Increasing support for high-risk/high-return research
 - Tripling the number of GRFs
 - Increasing support for early investigators



ARRA Priorities for NSF

- Increase success rate for highly meritorious research proposals
- Emphasize support for early investigators
- No new solicitations
- Additional funding for two prior solicitations:
 - Major Research Instrumentation (2nd round)
 - Academic Research Infrastructure



President's FY 2010 Request

- Provides \$7 billion for the National Science Foundation, a 16-percent increase over FY 2008
- Increases support for graduate research fellowships and for early-career researchers
- Increases support for the education of technicians in the high-technology fields that drive the Nation's economy
- Encourages more novel high-risk, high-reward research proposals
- Increases support for critical research priorities in global climate change
- Details: ***www.whitehouse.gov***



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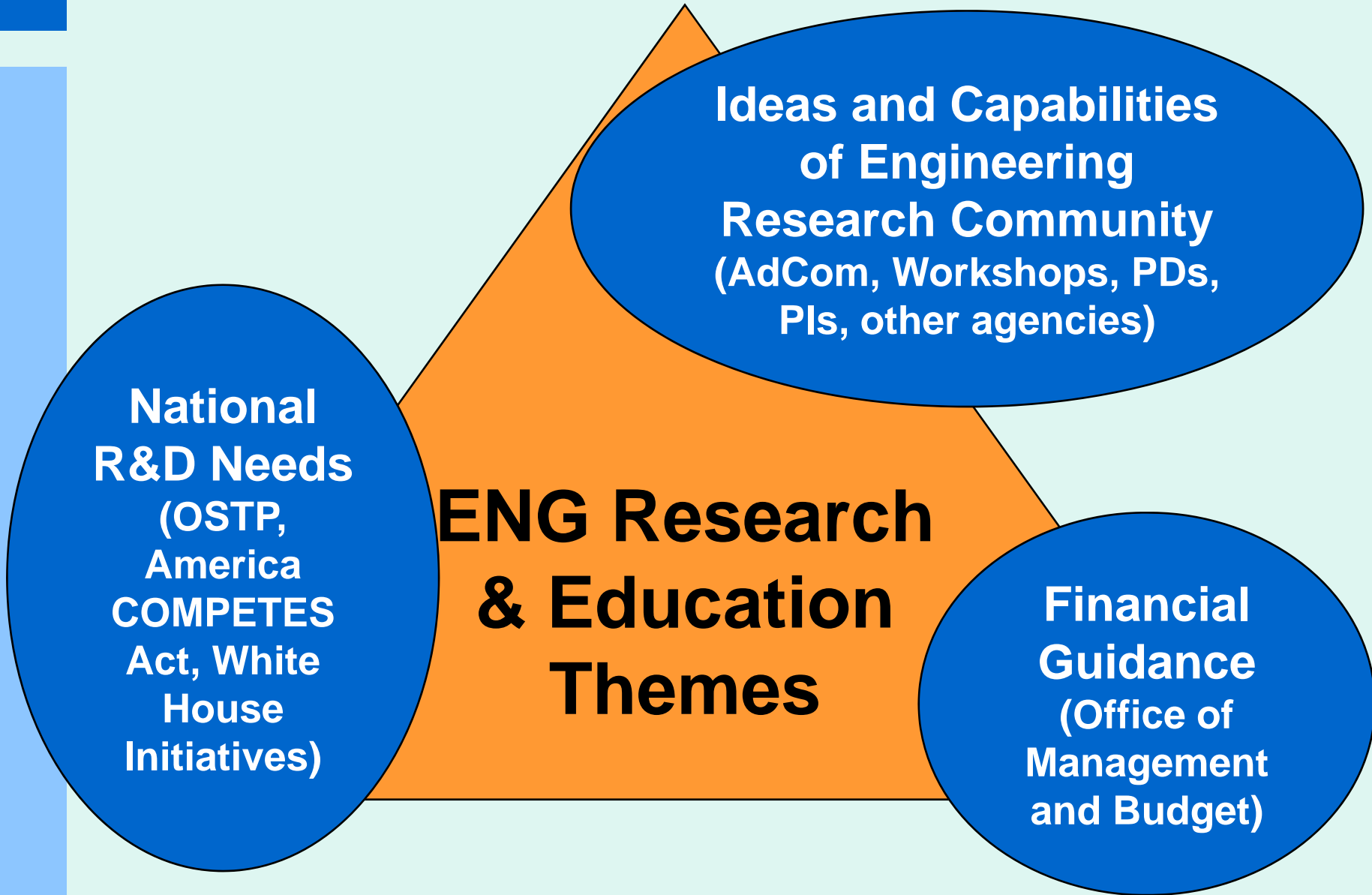


Vision for ENG

- Current directions
 - ENG Strategic Planning Overview, June 2005
 - Plan implementation analysis, 2006
 - Directorate reorganization, October 2006
- Future Directions
 - Input from Executive and Legislative Branches
 - Input from professional community
 - Input from staff including AD and Leadership Team



Developing ENG Themes



NAE Grand Challenges

- Make solar energy economical
- Provide energy from fusion
- Develop carbon sequestration methods
- Manage the nitrogen cycle
- Provide access to clean water
- Restore and improve urban infrastructure
- Advance health informatics
- Engineer better medicines
- Reverse-engineer the brain
- Prevent nuclear terror
- Secure cyberspace
- Enhance virtual reality
- Advance personalized learning
- Engineer the tools of scientific discovery



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NAE Grand Challenges Redux

- Energy and environment
- Health
- Security
- Quality of life



ELT Retreat Outcomes

- ENG themes
- FY 2010 topics for Emerging Frontiers in Research and Innovation
- Review of division and directorate strategies



ENG Research and Education Themes

- Cognitive engineering: Intersection of engineering and cognitive sciences
- Competitive manufacturing and service enterprises
- Complexity in natural and engineered systems
- Energy, water, and the environment
- Systems nanotechnology



EFRI Topics

- FY 2007
 - Auto-Reconfigurable Engineered Systems (ARES)
 - Cellular and Biomolecular Engineering (CBE)
- FY 2008
 - Cognitive Optimization (COPN)
 - Resilient and Sustainable Infrastructures (RESIN)
- FY 2009
 - Biosensing & Bioactuation (BSBA)
 - Hydrocarbon from Biomass (HyBi)
- FY 2010
 - ?
 - ?



Translational Research

- What does it mean?
- Why is it important?
- What role does/should ENG play in the NSF translational research portfolio?

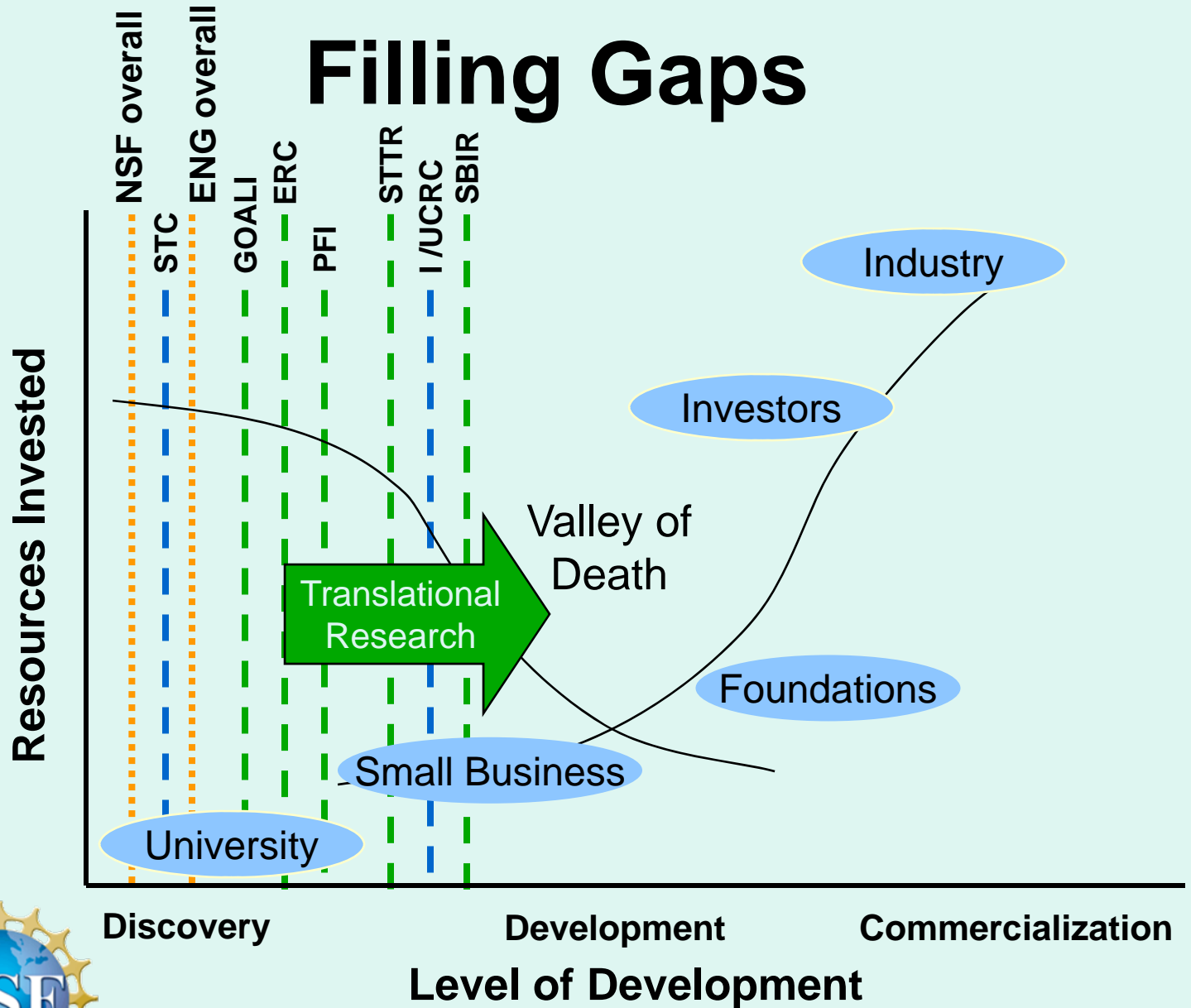


NSF Programs for Translational Research

- **Engineering Research Centers (ERC)**
- **Materials Research Science and Engineering Centers (MRSEC)**
- **Grant Opportunities for Academic Liaison with Industry (GOALI)**
- **Industry/University Cooperative Research Centers (I/UCRC)**
- **Small Business Technology Transfer (STTR)**
- **Small Business Innovation Research (SBIR)**
- **Nanoscale Interdisciplinary Research Teams (NIRT)**
- **Emerging Frontiers of Research and Innovation (EFRI)**
- **Other ENG programs**



Filling Gaps



Partnerships

- Partnerships with industry
- Partnerships with government agencies
- International collaboration
- Why are these important to NSF/ENG?



Educational Leadership

- Transforming engineering education
- Leadership role of the NSF
 - Role of ENG
 - Role of EHR



The Image of Engineering

- Image with community and public
- Image of the ENG Directorate within the NSF



Diversity

- Keeping in mind the multi-dimensional aspects: race, gender, culture, academic background, geography...
- Staying FOCUSED in ENG
- Doing WELL those things we choose to do
- Minimizing duplication



Evaluation

- Why do it?
- How do we do it now?
- If we are going to implement new assessment protocols, how to ensure valuable outcomes from the investment of resources?



AD Priorities for ENG

- **Translational research**
- **Partnerships**
- **Education**
- **Public understanding/image of engineering**
- **Diversity**

Assessment and Metrics



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Changes in AdCom

- Leadership: Steven Castillo begins as chair at fall meeting
- Membership:
 - One new member at spring meeting: Patrick Farrell, Provost of the University of Wisconsin-Madison
 - Nine new members at fall meeting



Future AdCom Meeting Dates

- October 21-22, 2009
- 2010 dates TBD

