Fall 2009 AdCom Update
Directorate for Engineering

Thomas W. Peterson
Assistant Director for Engineering
October 21, 2009
ENG Update

- AdCom business
- New ENG staff
- Budget and trends
- Priorities
- Emerging areas
ENG Update

• AdCom business
• New ENG staff
• Budget and trends
• Priorities
• Emerging areas
Changes in AdCom

• Leadership: Steven Castillo begins as chair

• Membership:
  – Ilesanmi Adesida, University of Illinois at Urbana–Champaign, begins membership
Future AdCom Meeting Dates

- April 21–22, 2010
- October 20–21, 2010
Fall Meeting Agenda Items

• ENG Update
• ADVANCE
• CBET and CMMI COVs
• Innovation
Fall 2009 Meeting Focus: Innovation

- Define role for ENG
- Identify areas of importance
  - Research
  - Education
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CBET

- **George Antos**, Program Director for Catalysis and Biocatalysis (Catalyst Realizations/University of Wisconsin)
- **Arvind Atreya**, Program Director for Combustion, Fire, and Plasma Systems (University of Michigan)
- **Lenore Clesceri**, Expert (NSF/RPI)
- **Nicholas Clesceri**, Expert (WATERS Network Project Office/RPI)
- **Charles Garris**, Expert (George Washington University)
- **James Lee**, Expert (Washington State University)
- **William Weigand**, Expert (University of Maryland)
- **H. Henning Winter**, Program Director for Fluid Dynamics (University of Massachusetts, Amherst)
- **Peter Wu**, AAAS Fellow (Concord Biomedical Sciences & Emerging Technologies/MIT)
CMMI

- **Steven McKnight**, Division Director (Army Research Laboratory)
- **John Daniels**, Program Director for Geotechnical Engineering and Geomechanics and Geotechnical Systems (EEC AAAS Fellow)
- **Terria Davis**, Program Assistant
- **Kenneth Jones**, Administrative Support Assistant
- **J. Philip King**, AAAS Fellow (New Mexico State University)
- **Tom Moynihan**, Program Assistant
- **Glaucio Paulino**, Program Director for Mechanics of Materials (University of Illinois at Urbana–Champaign)
- **Jyesha Smith**, Program Assistant
- **Mary Toney**, Program Director for Material Processing and Manufacturing (Albany International Corp.)
ECCS

• Robert Trew, Division Director (North Carolina State University)
• Dominique Dagenais, Expert (Avanex/Oclaro Corp.)
• Samir El-Ghazaly, Program Director for Electronics, Photonics, and Device Technologies (Univ. of Arkansas)
• Cynthia Greene, Operations Specialist
• Tracy May, Program Assistant
• Dwayne Mitchell, Program Support Manager
• Sara Rudolph, Program Assistant
• Randall Sisco, Program Assistant
• Kawthar Zaki, Expert (University of Maryland)
EEC

- **LaTanya Brooks**, Program Assistant
- **Daniel De Kee**, Program Director for Engineering Research Centers (Tulane University)
- **Gwen Hardenbergh**, Program Support Manager
- **Elena Hillenburg**, Program Assistant (IIP SCEP Student)
- **John Lamancusa**, Expert (Pennsylvania State University)
IIP

• Tiffany Sargent, AAAS Fellow (Intel Corp.)
• Ben Schrag, Program Director (Micro Magnetics)
• Ruth Shuman, Program Director (consultant/University of Minnesota Venture Center)
• Kevin Simmons, Einstein Fellow (Eagle’s View Academy/Florida State College at Jacksonville Aviation Center of Excellence)
• Ben Van Dusen, Einstein Fellow (South Eugene High School, Oregon)
• Grace Wang, Program Director (Hitachi)
• Josephine Yuen, Program Director (Trifomix, Inc.)
ENG Update

- AdCom business
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- **Budget and trends**
- Priorities
- Emerging areas
Budget and Trends

• FY 2009 Budget
• American Recovery and Reinvestment Act (ARRA)
• FY 2010 NSF Budget
• Proposal pressures and trends
Coordinated Three Budgets

• FY 2009
• American Recovery and Reinvestment Act (ARRA)
• FY 2010 budget request from President submitted
# NSF Budget Summary

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<tr>
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<tbody>
<tr>
<td>Change over FY 2008</td>
<td>n/a</td>
<td>13.0%</td>
<td>7.0%</td>
<td>56.5%</td>
<td>16.2%</td>
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*Dollars in billions*
<table>
<thead>
<tr>
<th>Category</th>
<th>FY 2009 Current Plan</th>
<th>FY 2010 Request</th>
<th>Amount Change</th>
<th>Percent Change</th>
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<tbody>
<tr>
<td>Biological Sciences</td>
<td>$655.81</td>
<td>733.00</td>
<td>$77.19</td>
<td>11.8%</td>
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<tr>
<td>Computer and Information Science and Engineering</td>
<td>573.74</td>
<td>633.00</td>
<td>59.26</td>
<td>10.3%</td>
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<tr>
<td>Engineering (includes SBIR/STTR)</td>
<td>693.34</td>
<td>764.52</td>
<td>71.18</td>
<td>10.3%</td>
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<tr>
<td>Geosciences</td>
<td>807.13</td>
<td>909.00</td>
<td>101.87</td>
<td>12.6%</td>
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<tr>
<td>Mathematical and Physical Sciences</td>
<td>1,255.96</td>
<td>1380.00</td>
<td>124.04</td>
<td>9.9%</td>
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<tr>
<td>Social, Behavioral, and Economic Sciences</td>
<td>240.3</td>
<td>257.00</td>
<td>16.7</td>
<td>6.9%</td>
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<tr>
<td>Office of Cyberinfrastructure</td>
<td>199.28</td>
<td>219.00</td>
<td>19.72</td>
<td>9.9%</td>
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<tr>
<td>Office of International Science and Engineering</td>
<td>44.03</td>
<td>49.00</td>
<td>4.97</td>
<td>11.3%</td>
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<tr>
<td>U.S. Polar Research Programs</td>
<td>470.67</td>
<td>516.00</td>
<td>45.33</td>
<td>9.6%</td>
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<tr>
<td>Integrative Activities</td>
<td>241.34</td>
<td>271.12</td>
<td>29.78</td>
<td>12.3%</td>
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<tr>
<td>Arctic Research Commission</td>
<td>1.5</td>
<td>1.60</td>
<td>0.1</td>
<td>6.7%</td>
</tr>
<tr>
<td><strong>Total, R&amp;RA</strong></td>
<td><strong>$5,183.10</strong></td>
<td><strong>$5,733.24</strong></td>
<td><strong>$550.14</strong></td>
<td><strong>10.6%</strong></td>
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</tbody>
</table>

Dollars in millions. Totals may not add due to rounding.
NSF Budget ($B)

- FY 2000
- FY 2001
- FY 2002
- FY 2003
- FY 2004
- FY 2005
- FY 2006
- FY 2007
- FY 2008
- FY 2009
- FY 2010 Request

ARRA
ENG and SBIR/STTR
Budgets ($M)
Funding Rates for Competitive NSF Awards, 2005–2009

[Bar chart showing funding rates for various NSF divisions from 2005 to 2009]
Mean Award Size, 2005–2009

Directorate for Engineering
Median Award Size, 2005–2009

Directorate for Engineering
ARRA Impacts

• Young Investigators
  – 80 additional CAREER awards
  – 16 additional GRF [above the 80 Women in Engineering (WENG) GRF Fellows funded annually by ENG]
  – 1 additional IGERT in the area of energy
  – 40 postdocs in industry

• High Risk / High Reward Research
  – 7 additional EFRI awards

• Translational Research
  – 257 additional small businesses (50% increase)
  – 9 additional I/UCRCs
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
Growth in ENG Research Support to Broaden Participation

• Broadening Participation Research Initiation Grants in Engineering (BRIGE)
  – 38 total in FY 2009 (28 regular appropriation + 10 ARRA) (28 total in FY 2008)
  – Reaching out to 9 new locations, including Hawaii and Puerto Rico (see maps)

• Graduate Research Supplements (GRS)
  – 29 total in FY 2009 (12 CBET, 9 CMMI, 5 ECCS, 2 EEC, and 1 EFRI)
Growth in ENG Outreach to Broaden Participation

National and International Workshops
- Address topics of community importance
- Involve faculty and students
- Leverage NSF funding and increase others’ commitment to goals through partnerships

Collaboration with Professional Organizations
- Provide mentoring and strengthen community networks
- Engage students, faculty, and community members
- Disseminate resources and develop curricula
FY 2009 BRIGE Awards

Awardees
- 8
- 4
- 2
- 1
- None
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Presidential Priorities

- Energy and climate
- Cyber-infrastructure
- Nanotechnology
- Convergence of biology and the physical sciences/engineering
- Innovation
- Crosscutting priorities
  - Increasing support for high-risk/high-return research
  - Tripling the number of GRFs
  - Increasing support for early investigators
FY 2010 NSF Initiatives

- Climate Change Science Program
- National Nanotechnology Initiative (NNI)
- Networking and Information Technology R&D
- Climate Research
- Cyber-enabled Discovery and Innovation (CDI)
- Science and Engineering Beyond Moore’s Law (SEBML)
Other ENG Investments

• **Sustainability**
  – RE-ENERGYSE: REgaining our ENERGY Science and Engineering Edge, in collaboration with Dept. of Energy

• **Bioeconomy**

• **Innovation**
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OSTP Interest in ENG-related Areas

- Simulation Based Engineering and Science
- Nano – EHS
- Science and Engineering Beyond Moore’s Law
- The Bio-Science-Engineering Interface
- INNOVATION
Innovation

• Innovation and Information Policy
  – Susan Crawford, National Economic Council

• Regional Innovation Clusters
  – Ginger Lew, National Economic Council

• In both cases, involvement of DOC, DOE, DOEd, DOL, NSF, OSTP, USDA
Innovation for Growth

Catalyze Breakthroughs for National Priorities
- Unleash a clean energy revolution
- Support advanced vehicle technology
- Drive breakthroughs in health IT
- Address the "grand challenges" of the 21st century

Promote Competitive Markets that Spur Productive Entrepreneurship
- Promote American exports
- Support open capital markets that allocate resources to the most promising ideas
- Encourage high-growth and innovation-based entrepreneurship
- Improve public sector innovation and support community innovation

Invest in the Building Blocks of American Innovation
- Restore American leadership in fundamental research
- Educate the next generation with 21st century knowledge and skills while creating a world-class workforce
- Build a leading physical infrastructure
- Develop an advanced information technology ecosystem

Directorate for Engineering
Emerging Area - Innovation

- Current contributions to Innovation
- Industry-Inspired Research
- Innovation Fellowships