



*Civil, Mechanical, and Manufacturing  
Innovation Division*

*CMMI Division  
ASEE ERC 2010*

*Steven H. McKnight  
Division Director*



## ***CMMI Reorganization & Merger History\****

### ***CMS (FY 2006)***

***\$88.4 Million  
12 Programs  
10 Program  
Directors  
~1400 Proposals***

### ***DMI (FY 2006)***

***\$66.1 Million  
7 Programs  
7 Program  
Directors  
1,126 Proposals***

### ***CMMI FY 2009***

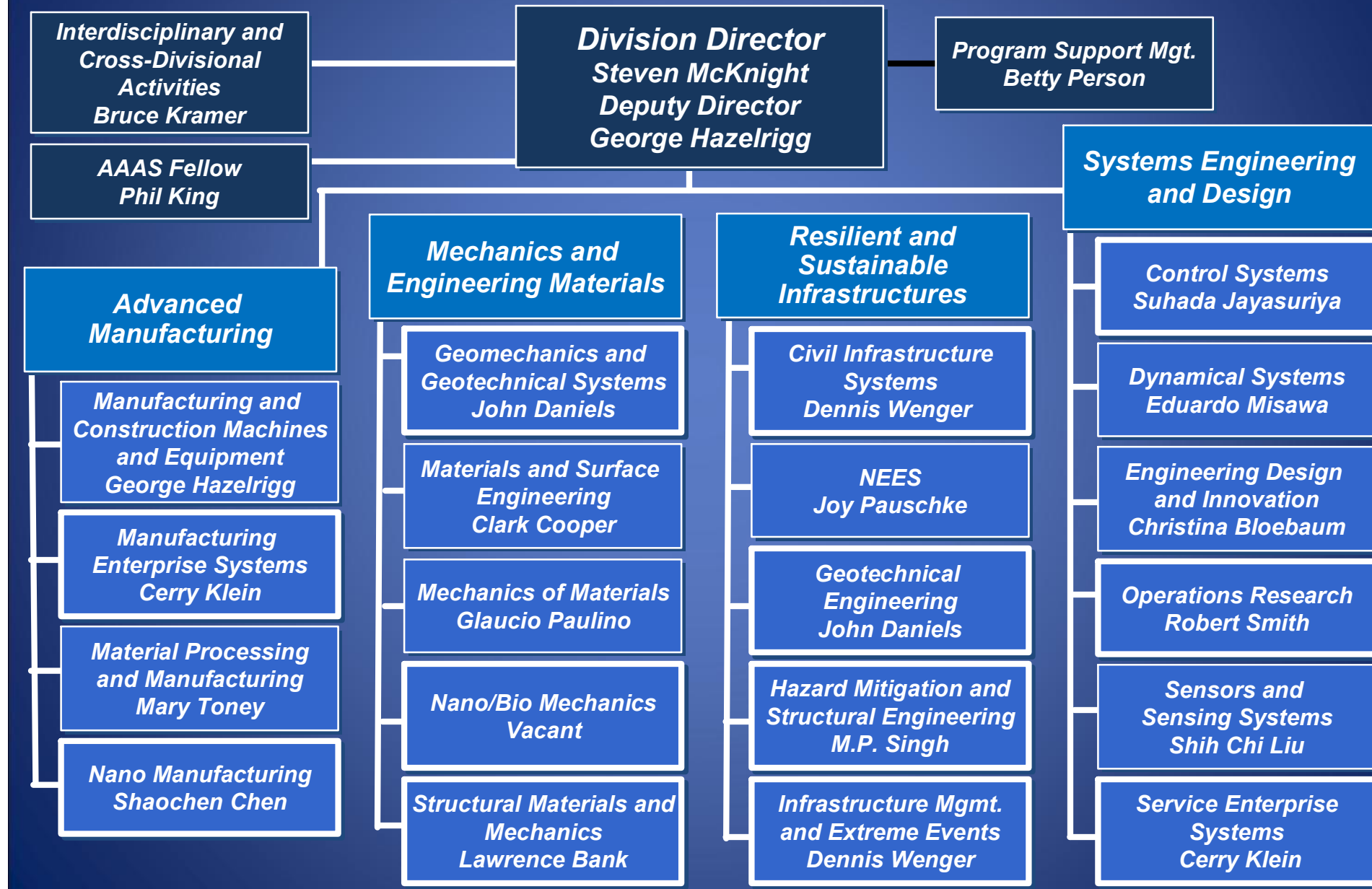
***\$232.6 Million\*\*  
4 Clusters  
20 Programs  
18 Program Directors  
17 Staff Members  
2,923 Proposals***

***\*Just completed third year***

***\*\*Includes ARRA***



# Current CMMI Organization

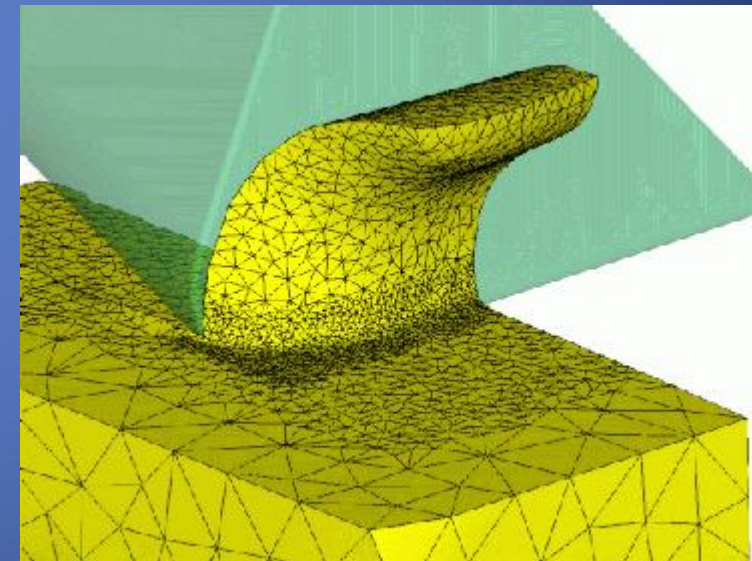




## *Current CMMI Research Clusters*

### *Advanced Manufacturing*

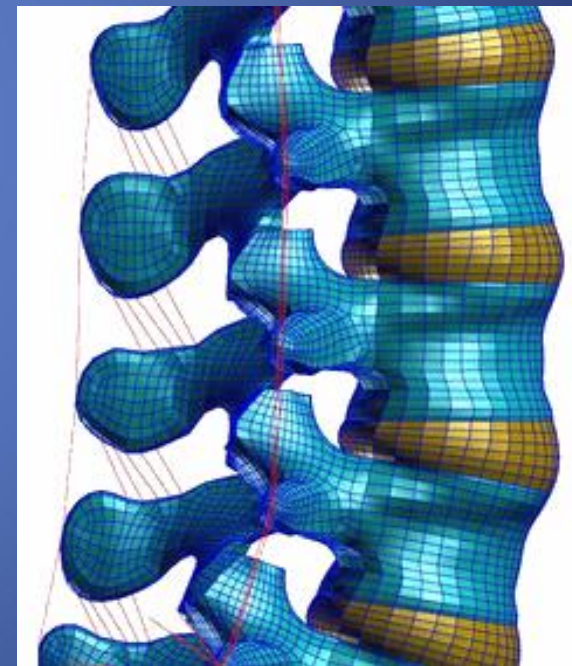
- *Research leading to transformative advances in manufacturing and building technologies, with emphases on efficiency, economy, and sustainability*
- *Supporting programs*
  - *Manufacturing and Construction Equipment*
  - *Manufacturing Enterprise Systems*
  - *Materials Processing and Engineering*
  - *Nanomanufacturing*





## ***Current CMMI Research Clusters*** ***Mechanics and Engineering Materials***

- ***Research aimed at advances in the transformation and use of engineering materials efficiently, economically, and sustainably***
- ***Supporting programs***
  - ***Geomechanics and Geomaterials***
  - ***Materials and Surface Engineering***
  - ***Mechanics of Materials***
  - ***Nano/Bio Mechanics***
  - ***Structural Materials and Mechanics***





## ***Current CMMI Research Clusters Resilient and Sustainable Infrastructures***

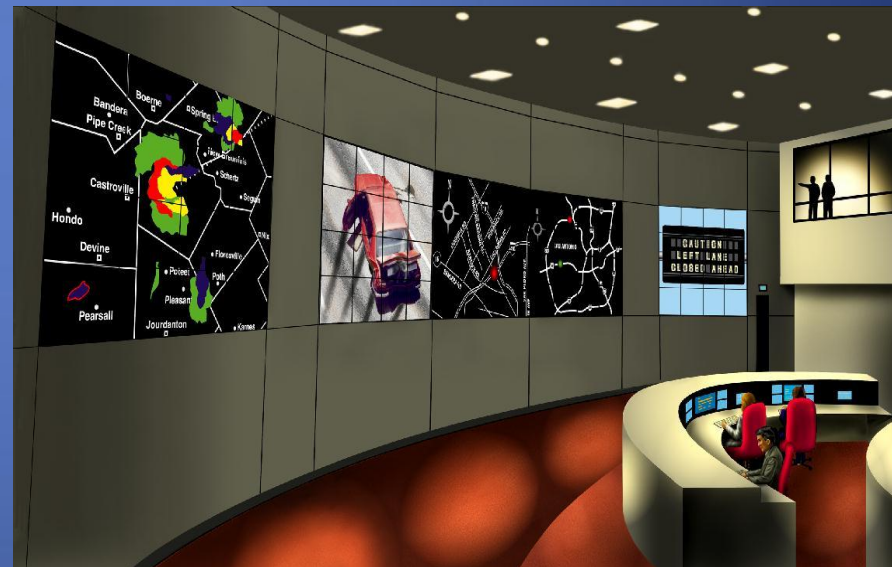
- ***Research to advance fundamental knowledge and innovation for resilient and sustainable civil infrastructure and distributed infrastructure networks***
- ***Supporting programs***
  - *Civil Infrastructure Systems*
  - *NEES – Ops and Research*
  - *Geotechnical Engineering*
  - *Hazard Mitigation and Structural Engineering*
  - *Infrastructure Mgt. and Extreme Events*





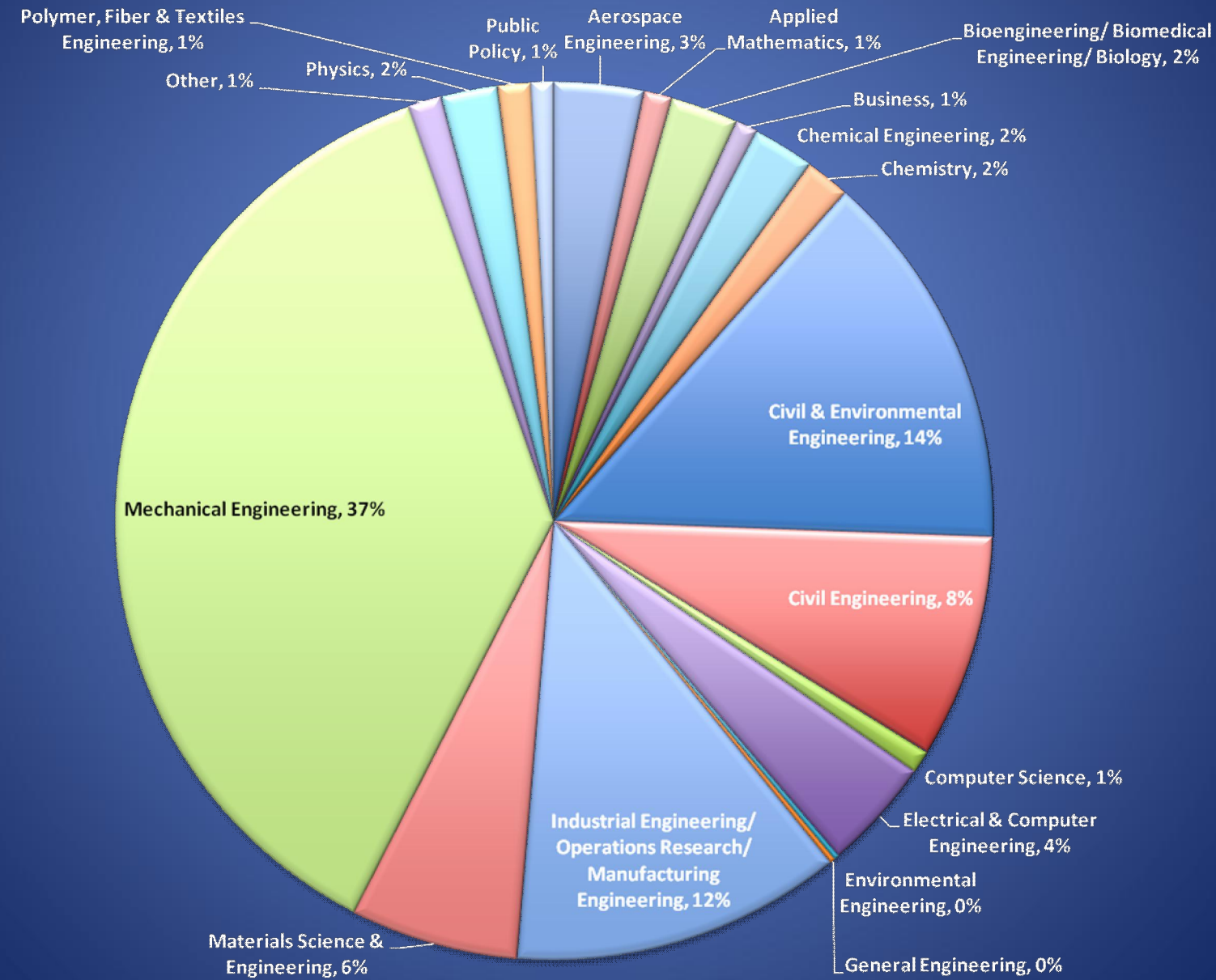
## *Current CMMI Research Clusters Systems Engineering and Design*

- *Research on the decision-making aspects of engineering, including design, control, and optimization*
- *Supporting programs*
  - *Control Systems*
  - *Dynamical Systems*
  - *Engineering Design and Innovation*
  - *Operations Research*
  - *Sensors and Sensing Systems*
  - *Service Enterprise Systems*





# The CMMI Research Community: Awards Made

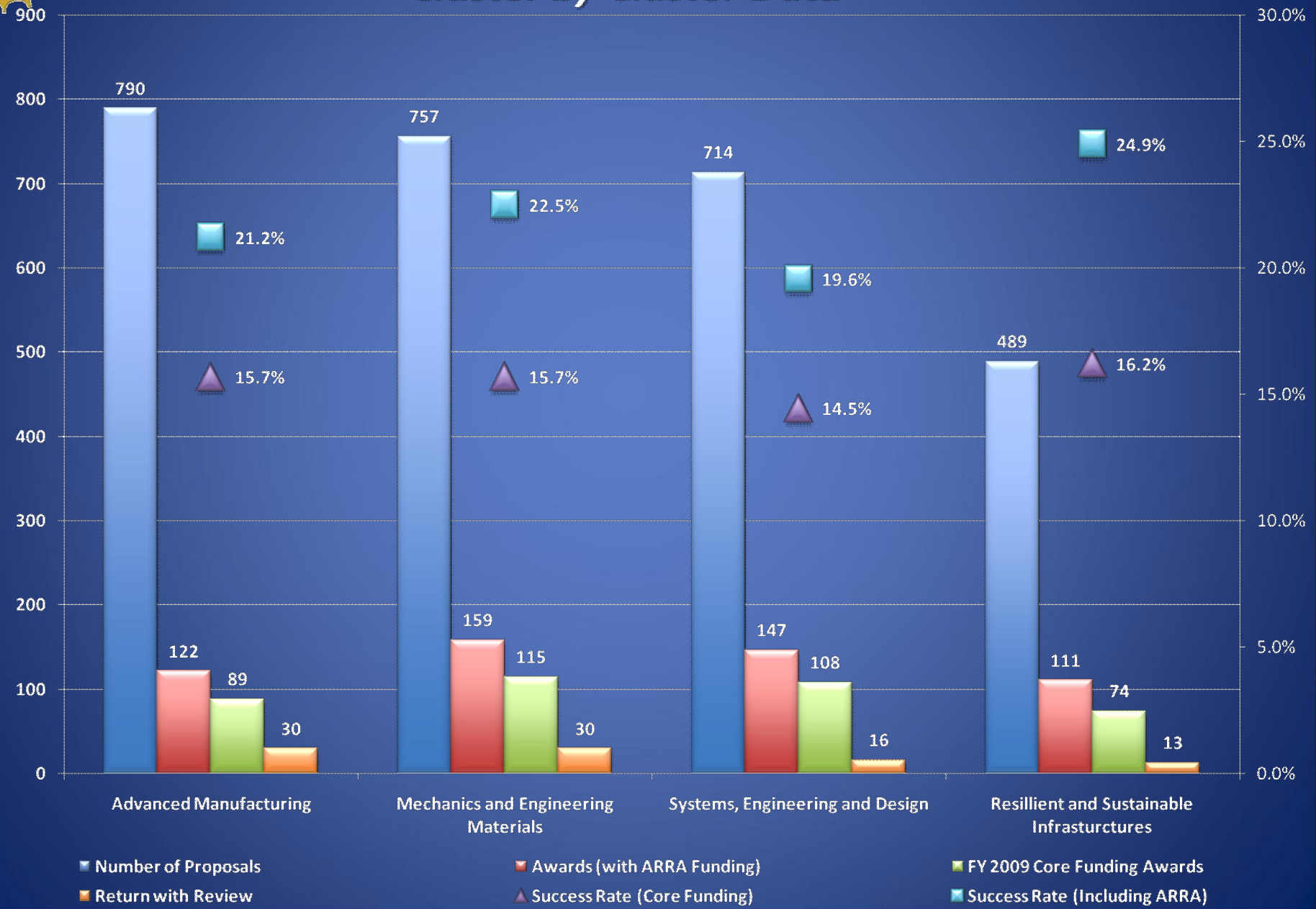






# CMMI FY 2009 Funding at a Glance

## Cluster by Cluster Data





## *CMMI Broadening Participation Activities*

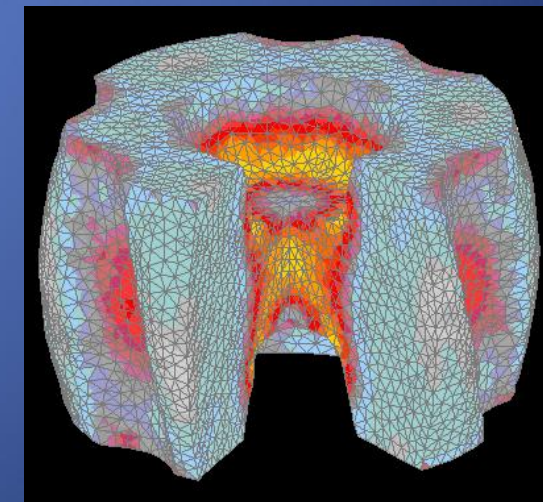
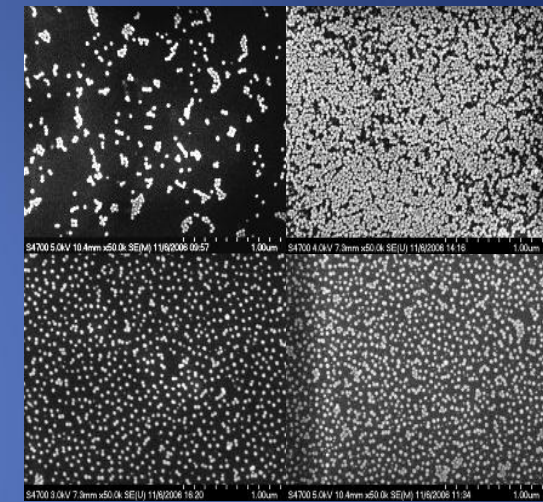
- *CAREER Proposal Writing Workshops*
  - *Sponsored & participated in by CMMI PDs*
- *BRIGE program*
  - *Increased BRIGE awards from 8 in 2008 to 14 awards in 2009*
- *Graduate Research Supplements (GRS)*
  - *doubled the level of funds and increased the number of supplements to 9 awards in 2009*
- *REU supplements to existing awards*
  - *Two undergraduate student supplements if one is a woman/underrepresented group member*



# *Future Directions*

## *Broad Opportunities*

- *Novel materials, processes, and manufacturing technologies*
- *Sustainability*
- *Simulation-based engineering and science*
- *Engineering applied to service-based enterprises and the human dimension*
- *Innovative product and complex system design – underlying theories of design*





# *Proposal Submissions*

## *What We (and Reviewers) Want to Know*

- *What are your research and educational objectives?*
  - *This is what directs your proposal to the appropriate program*
- *What is your approach?*
  - *Outline — just a few sentences*
- *What is the specific research contribution you will make to the knowledge base (the intellectual merit)?*
- *If successful, what will be the benefit to society (the broader impact)?*



*Thank You!*



# *Backups*



## *12 Steps to a Better Proposal*

- 1. Know yourself - strengths/weaknesses*
- 2. Know the program from which you seek support*
- 3. Read the program announcement and GPG*
- 4. Formulate clear and appropriate research and education objectives*
- 5. Develop a viable plan*
- 6. State your objectives up front in your proposal*
- 7. Frame your project around the work of others*



## *12 Steps to a Better Proposal*

- 8. Grammar and spelling count*
- 9. Format and brevity are important*
- 10. Know the review process*
- 11. Proof read the proposal before you submit it*
- 12. Submit your proposal early and proof read it after you submit it*

*Writing a good proposal takes common sense and effort—it's not magic*