

Nuclear Science and MPS

Get Acquainted Presentation to NSAC, 20 February 2004

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MPS MISSION

To make discoveries about the Universe and the laws that govern it; to create new knowledge, materials, and instruments which promote progress across science and engineering; to prepare the next generation of scientists through research, and to share the excitement of exploring the unknown with the nation.

SCIENTIFIC THEMES

- *Charting the evolution of the Universe from the Big Bang to habitable planets and beyond*
- *Understanding the fundamental nature of space, time, matter, and energy*
- *Creating the molecules and materials that will transform the 21st century*
- *Developing tools for discovery and innovation throughout science and engineering*
- *Understanding how microscopic processes enable and shape the complex behavior of the living world*
- *Discovering mathematical structures and promoting new connections between mathematics and the sciences*
- *Conducting basic research that provides the foundation for our national health, prosperity, and security*

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Domestic S&E Workforce Diversity: Survival not Political Correctness



UC Physics Faculty, 2000



Face of the America, 2005



Chemistry Research Group

The number of bright foreigners in science & engineering coming to the US is dropping (visa problems, less welcoming atmosphere, good opportunities elsewhere)

Coupled Problems: Numbers and Diversity

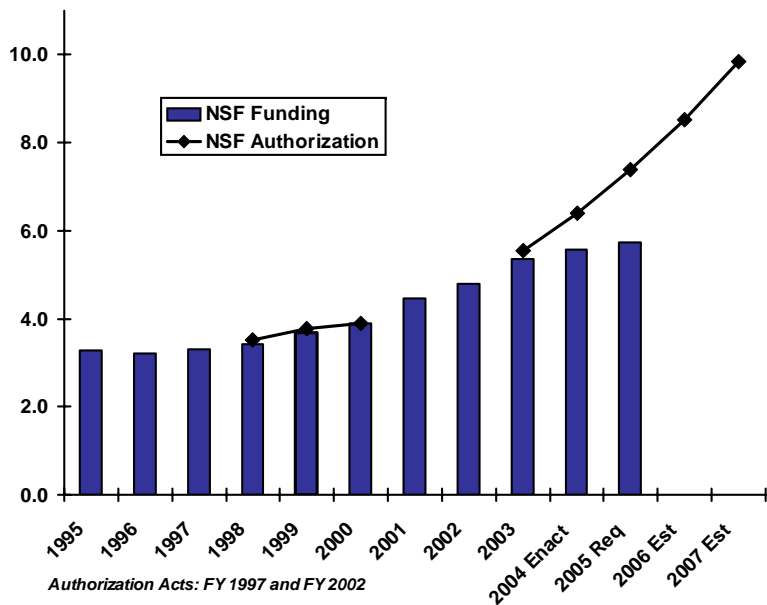
- To maintain our science/technology based prosperity and security we need to attract more domestic students from the full spectrum of our society
- Diversity alone would double the numbers
- Universities and Discovery Science have a critical role to play
 - Attract students to science & engineering
 - Faculties that reflect the face of America

NSF Funding

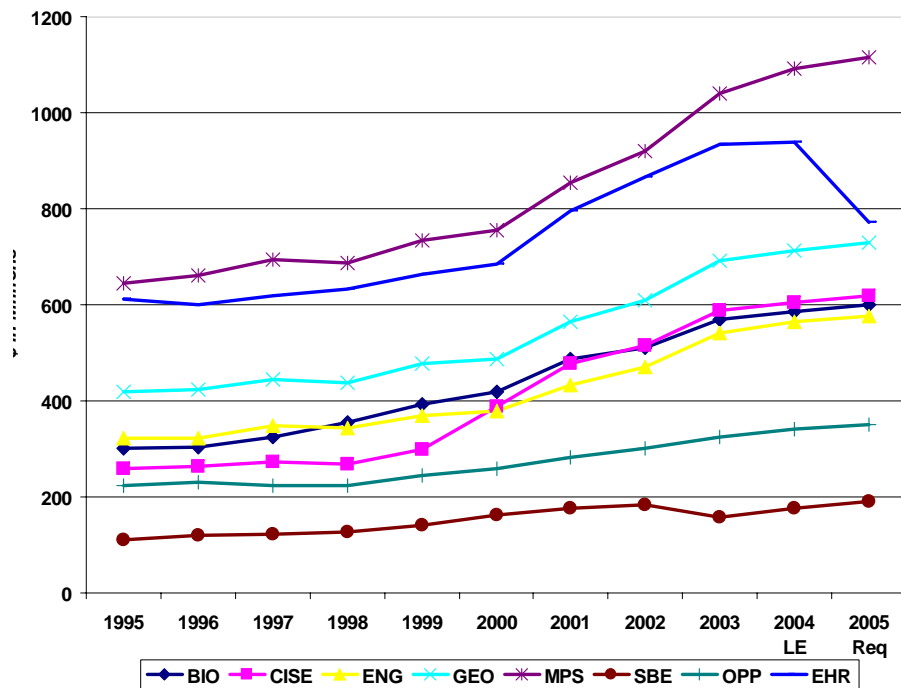
FY 1995 - 2005 Request

\$\$ in Millions

NSF Funding and Authorizations FY 1995- 2007 Estimates



NSF Funding by Directorates/Office FY 1995-2005 Request



+60% since 1999

NSF Budget Request

\$\$ in Millions

	FY2003 Actual	FY 2004 Enacted	FY 2005 Request	Change \$ 05/04	Change % 05/04
R&RA	\$4,054.43	\$4,251.36	\$4,452.31	\$200.95	4.7%
MREFC	179.03	154.97	213.27	58.30	36.7%
EHR	934.98	938.98	771.36	-167.62	-17.9%
S&E	189.42	218.70	294.00	75.30	34.4%
OIG	8.70	9.94	10.11	0.17	1.7%
NSB	2.88	3.88	3.95	0.07	1.8%
Total: NSF	\$5,369.34	\$5,577.83	\$5,745.00	\$167.17	3.0%

MPS Budget Request

\$\$ in Millions

	FY2003 Actual	FY 2004 Enacted	FY 2005 Request	Change \$ 05/04	Change % 05/04
AST	\$187.07	\$196.55	\$204.35	\$7.80	4.0%
CHE	181.61	185.22	188.91	3.69	2.0%
DMR	241.39	250.89	253.18	2.29	0.9%
DMS	178.79	200.41	202.25	1.84	0.9%
PHY	224.50	227.67	235.76	8.09	3.6%
OMA	27.34	30.77	31.05	0.28	0.9%
Total: MPS	\$1,040.70	\$1,091.51	\$1,115.50	\$23.99	2.2%

MPS FY 2005 Highlights

- *Physics of the Universe (\$12M split between AST and PHY)
- *Physical bases of life processes (\$2M CHE)
- *Enhanced support of core (\$10M across MPS)
- *RSVP construction funding requested in FY 2005

Trends in Federal Funding of the Basic Research

- Concern with deficit means tight budgets (0.5% increase in non-Defense discretionary spending in FY05 Budget)
 - NSF (+3.0%)
 - NIH (+2.6%)
 - NASA Space Science (+1.0%) and significant restructuring
 - DOE Office of Science (-1.0%)
- Closer coordination of agencies through Office of Science & Technology Policy (OSTP) and OMB
- Focus on National Priorities (e.g., Homeland Security, Nanotechnology, CyberInfrastructure/CyberScience)
- Emphasis on the Physical Sciences (correct imbalance between Physical Sciences and Lifesciences)

Nuclear Science is Prominent in Physics of the Universe

- Neutrino mass and dark matter (UG Lab)
- Origin of heaviest elements (RIA)
- New states of matter (RHIC)

Strong Program in Place for Discovery and Understanding

- Jefferson Lab
- RHIC
- Neutrinos
- NSCL
- Institute for Nuclear Theory and Joint Institute for Nuclear Astrophysics
- University Labs and smaller-scale experiments (e.g., UCN, ...)
- Embrace of new directions (eg, Neutrino Physics and Astrophysics, UG Lab)

Strong Record of DOE/NSF Cooperation

- JLab
- RHIC and RHIC Spin
- Neutrinos
- NSCL
- NSAC
- Planning for RIA (ANL and NSCL)

NSAC is Effective

- Works smoothly with two masters
- Willing to take on needed tasks
- Works well with community to make hard decisions and set priorities