

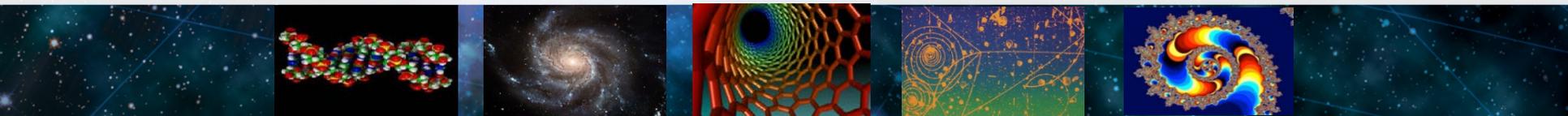
FY 2016 Budget Request

National Science Foundation Directorate for Mathematical and Physical Sciences

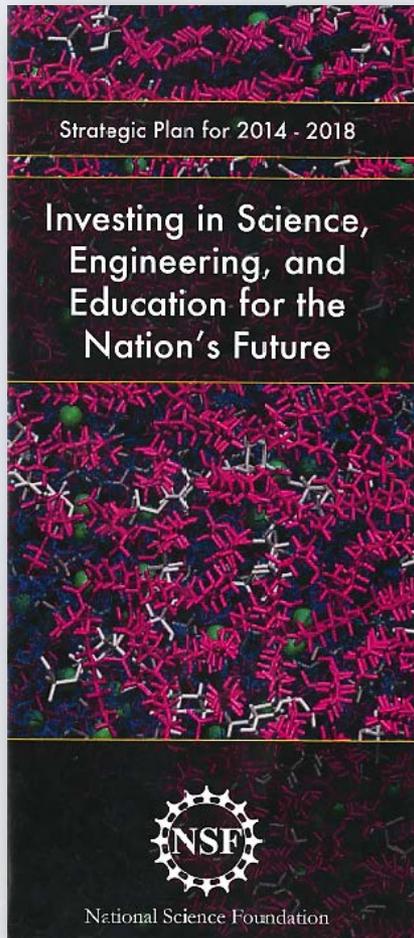


F. Fleming Crim
Assistant Director for
Mathematical and Physical Sciences

February 2, 2015



NSF Core Mission: Fundamental Research

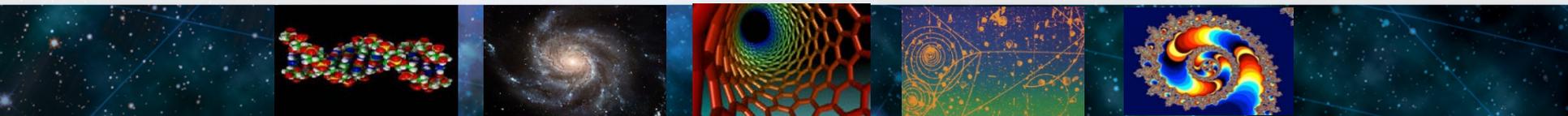


NSF Strategic Goals

Transform the Frontiers

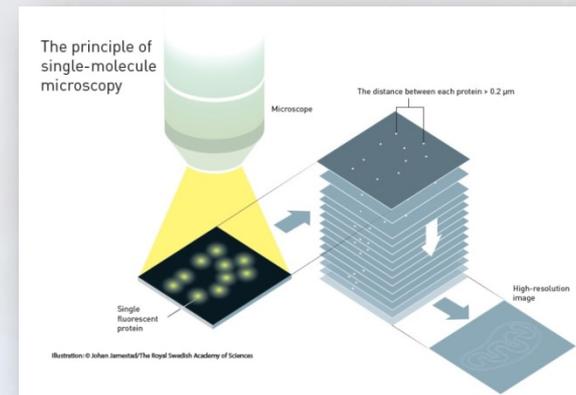
Innovate for Society

Perform as a Model Organization



The Excitement of Advancing Discovery

Super-Resolved Fluorescence Microscopy



Chemistry Nobel Laureates



Betzig



Hell



Moerner



Most Recent Medal of Science Recipients

Blackwell (posth.)



(DMS)

Chorin



(DMS)

Klinman



(CHE)

Meinwald

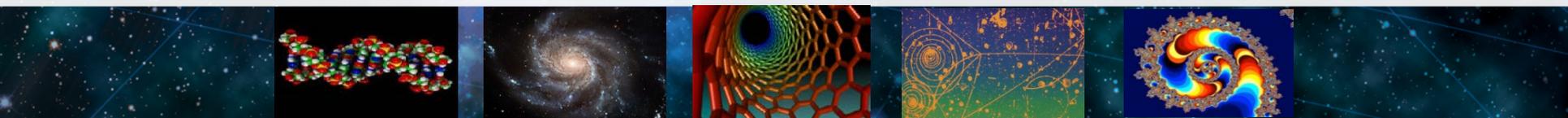


(CHE)

Richter

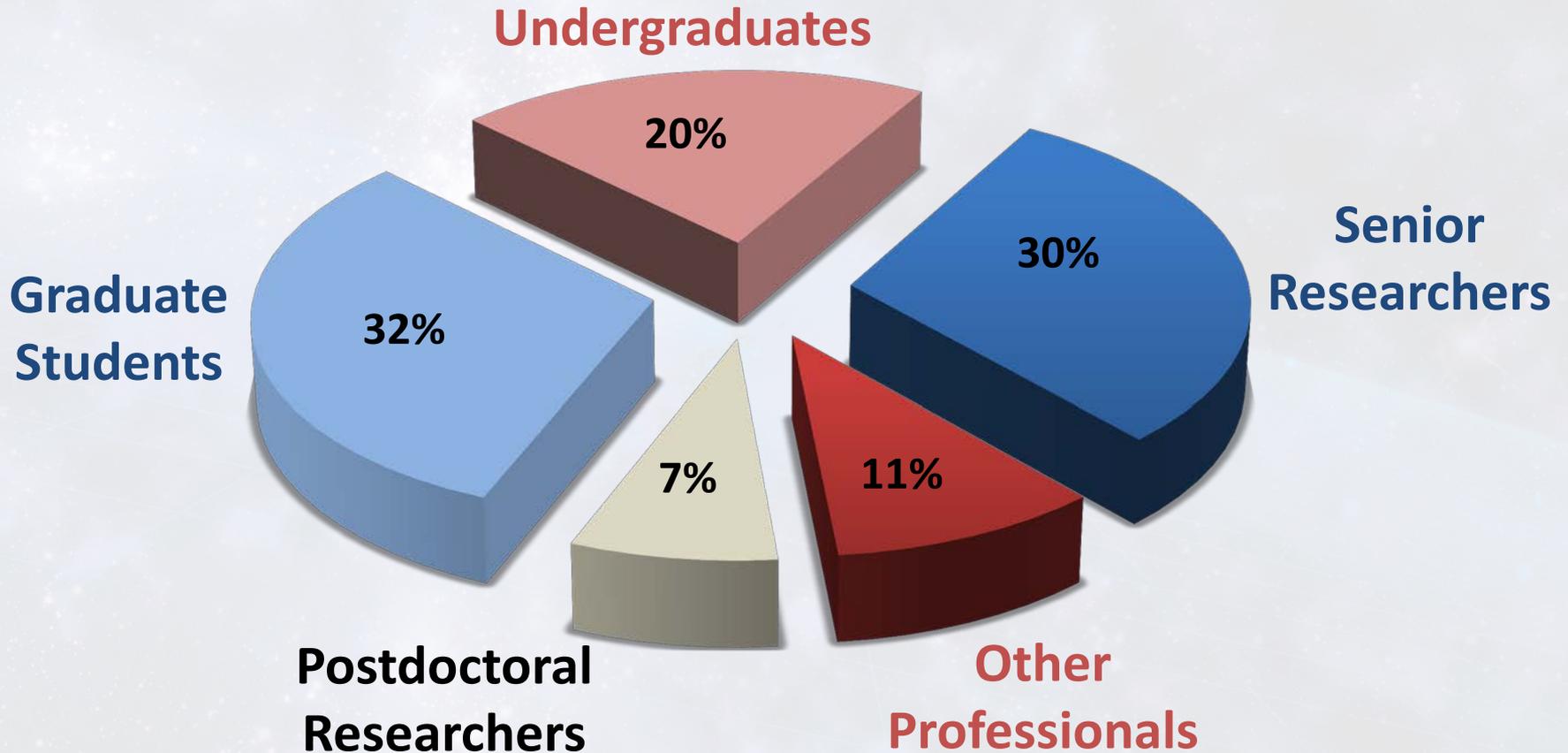


(PHY)

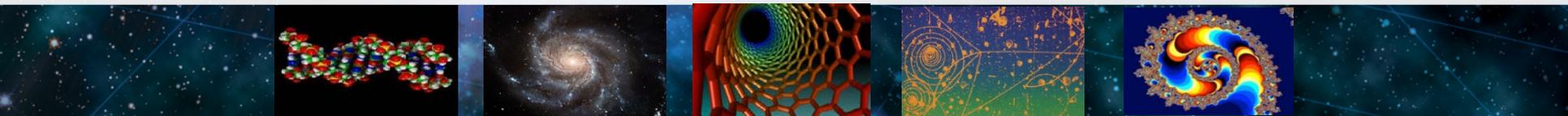


People Do Science

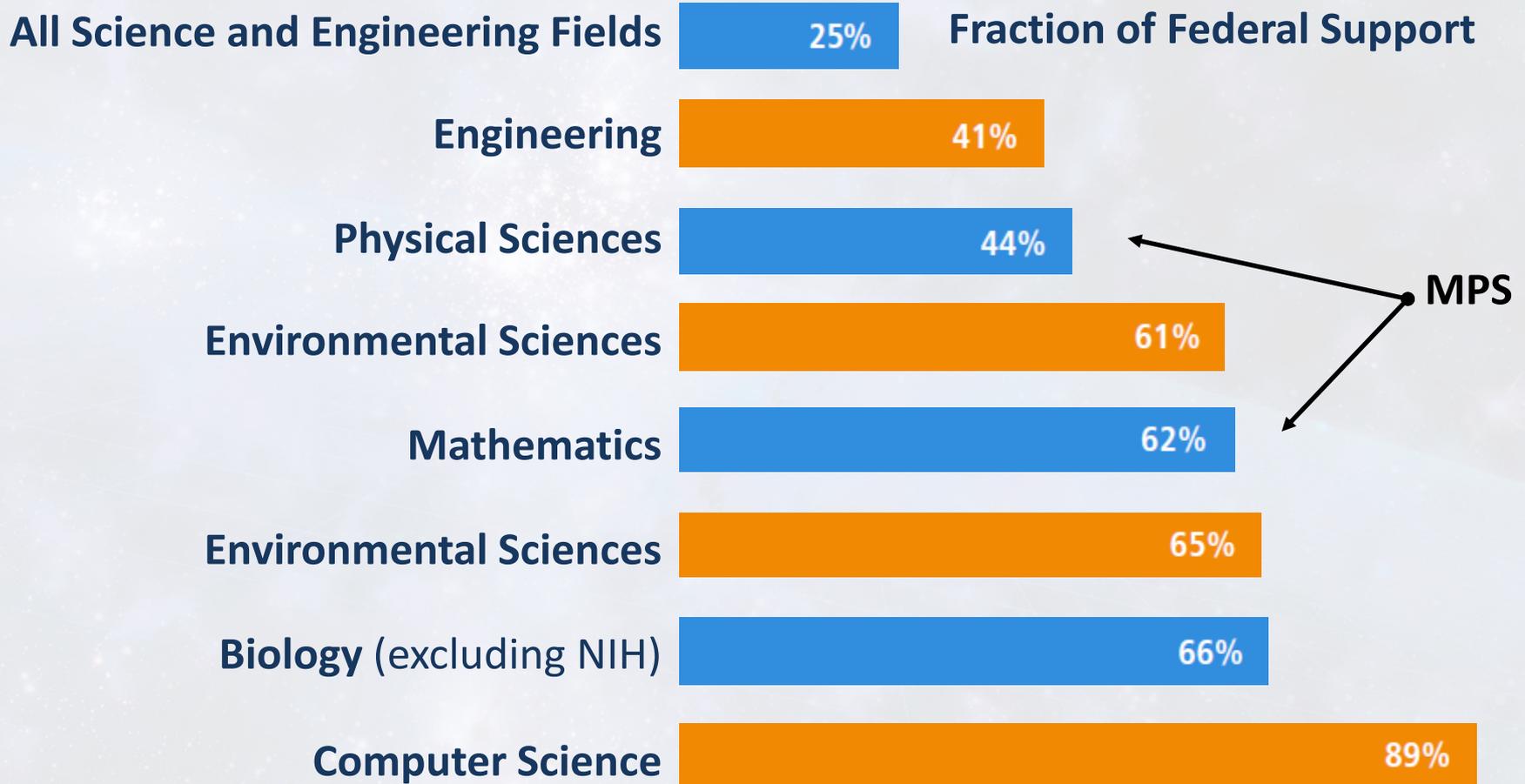
28,400 People in MPS Activities*



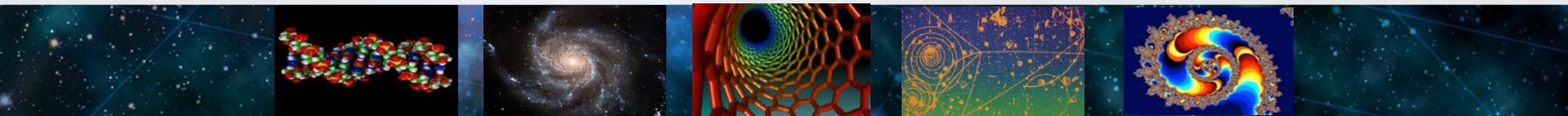
*Estimated for FY 2016



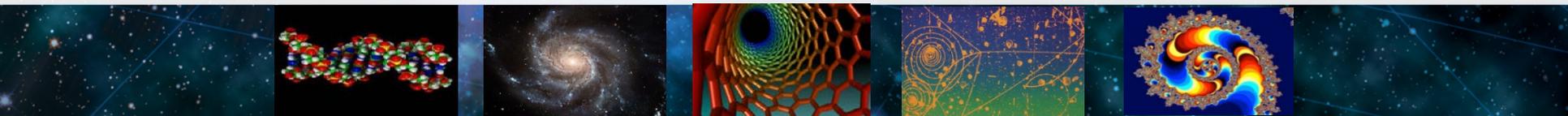
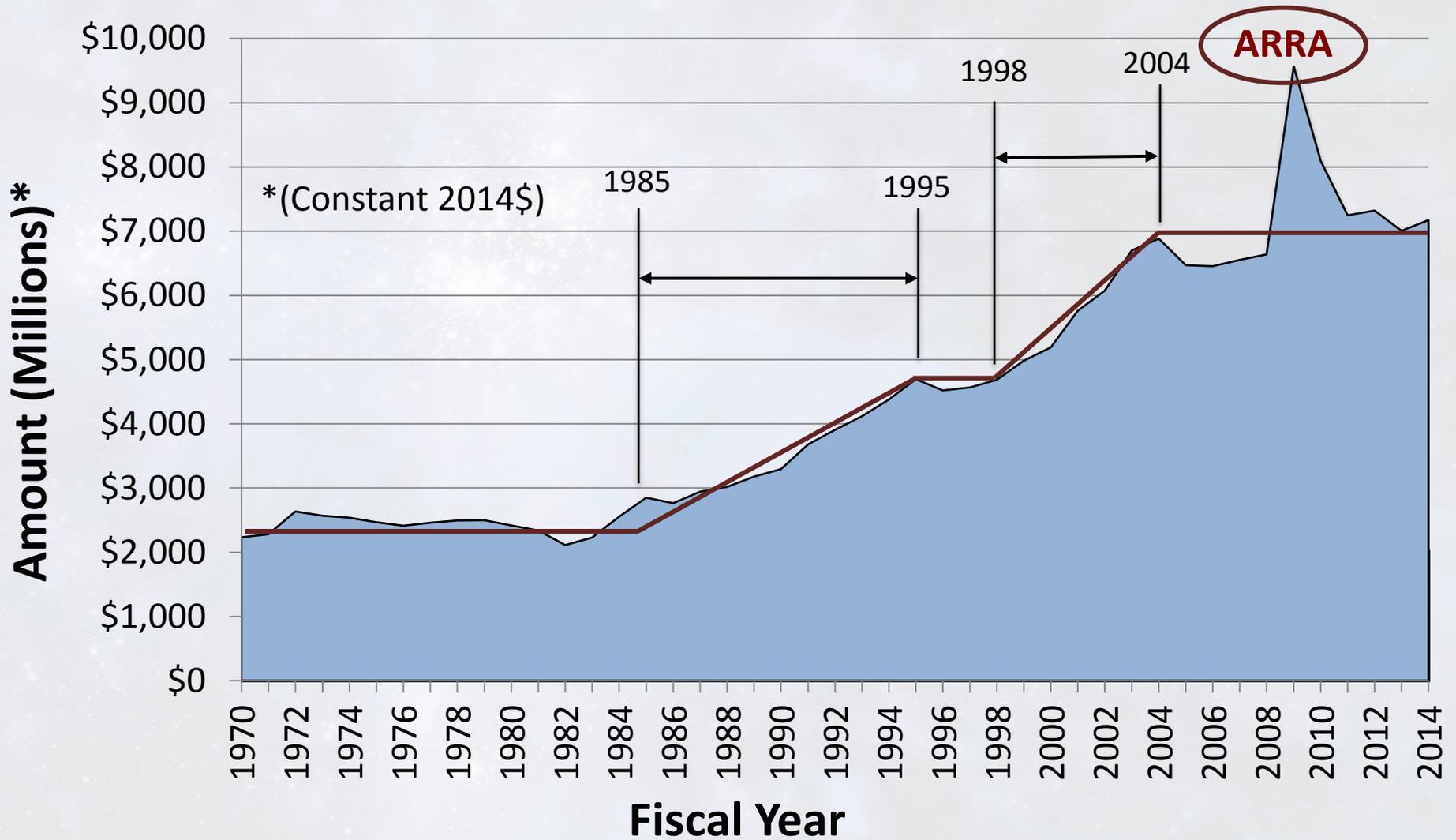
NSF Supports Academic Basic Research



Source: NSF/ Center for National Science and Engineering Statistics, FY 2013



NSF Funding History



UNITED STATES
National Science Foundation

UNITED STATES
National Science Foundation

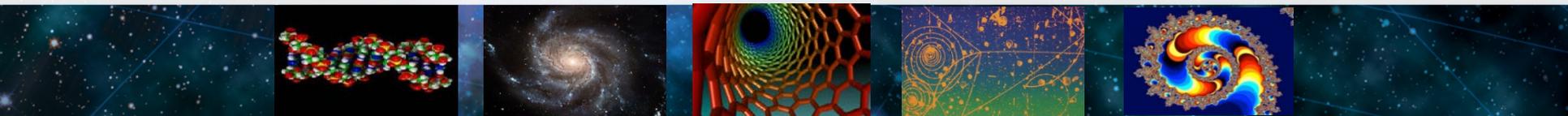
	FY 2014	FY 2015 (request)	
NSF	\$ 7172 M	\$ 7255 M	1.2%
R&RA	\$ 5808 M	\$ 5807 M	--

FY 2015 (CROmnibus)

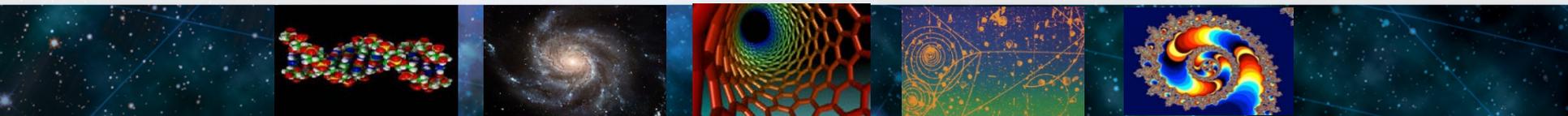
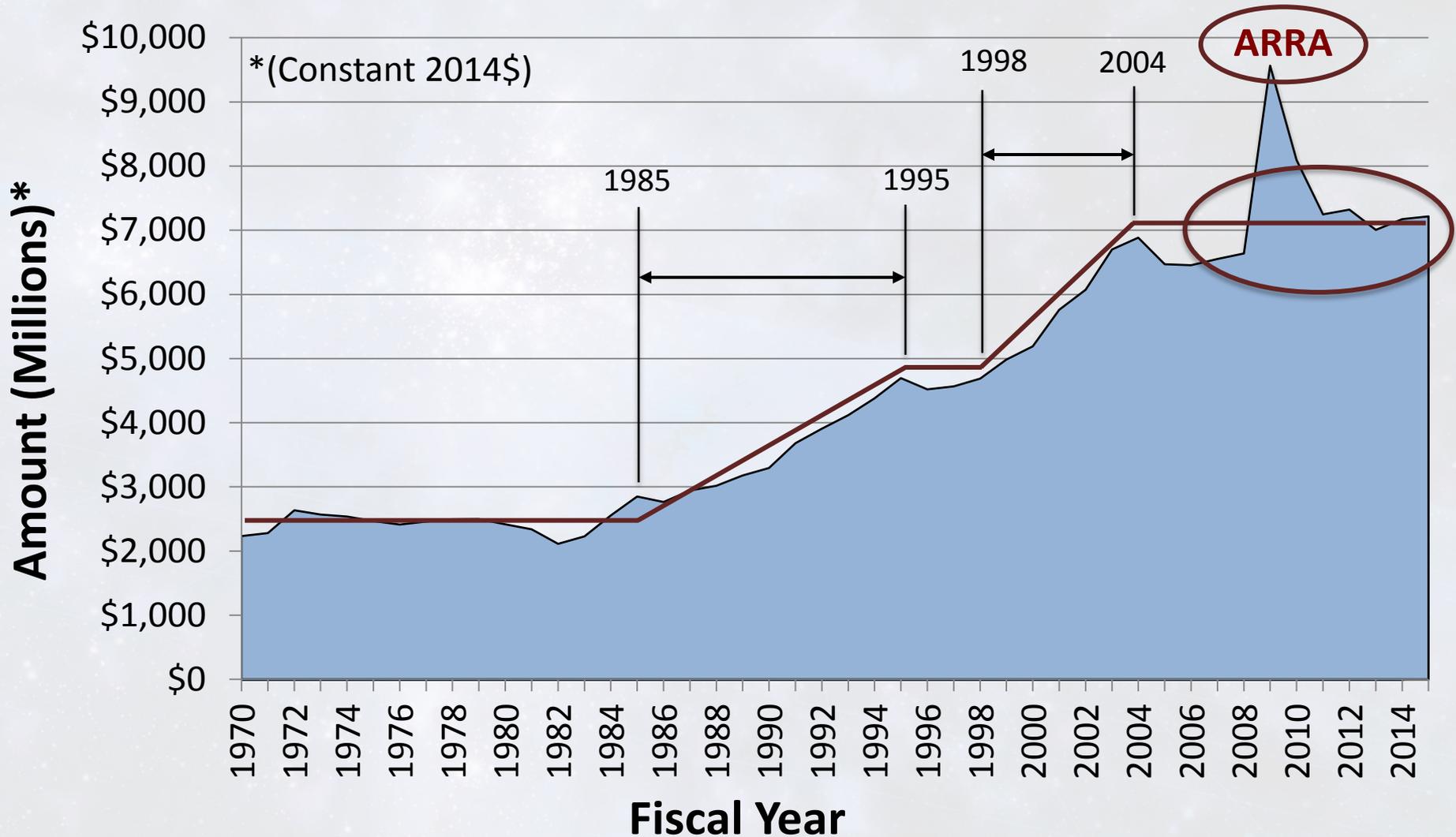
\$ 7344 M	2.4%
\$ 5934 M	2.2%

FY 2015

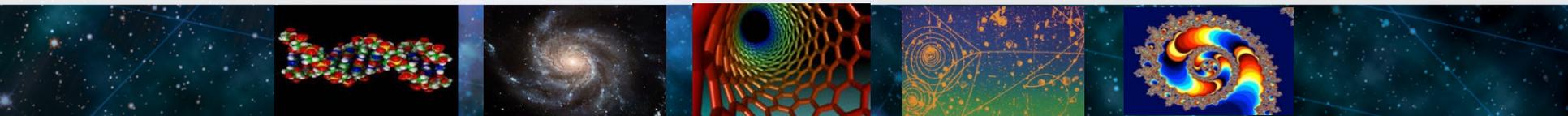
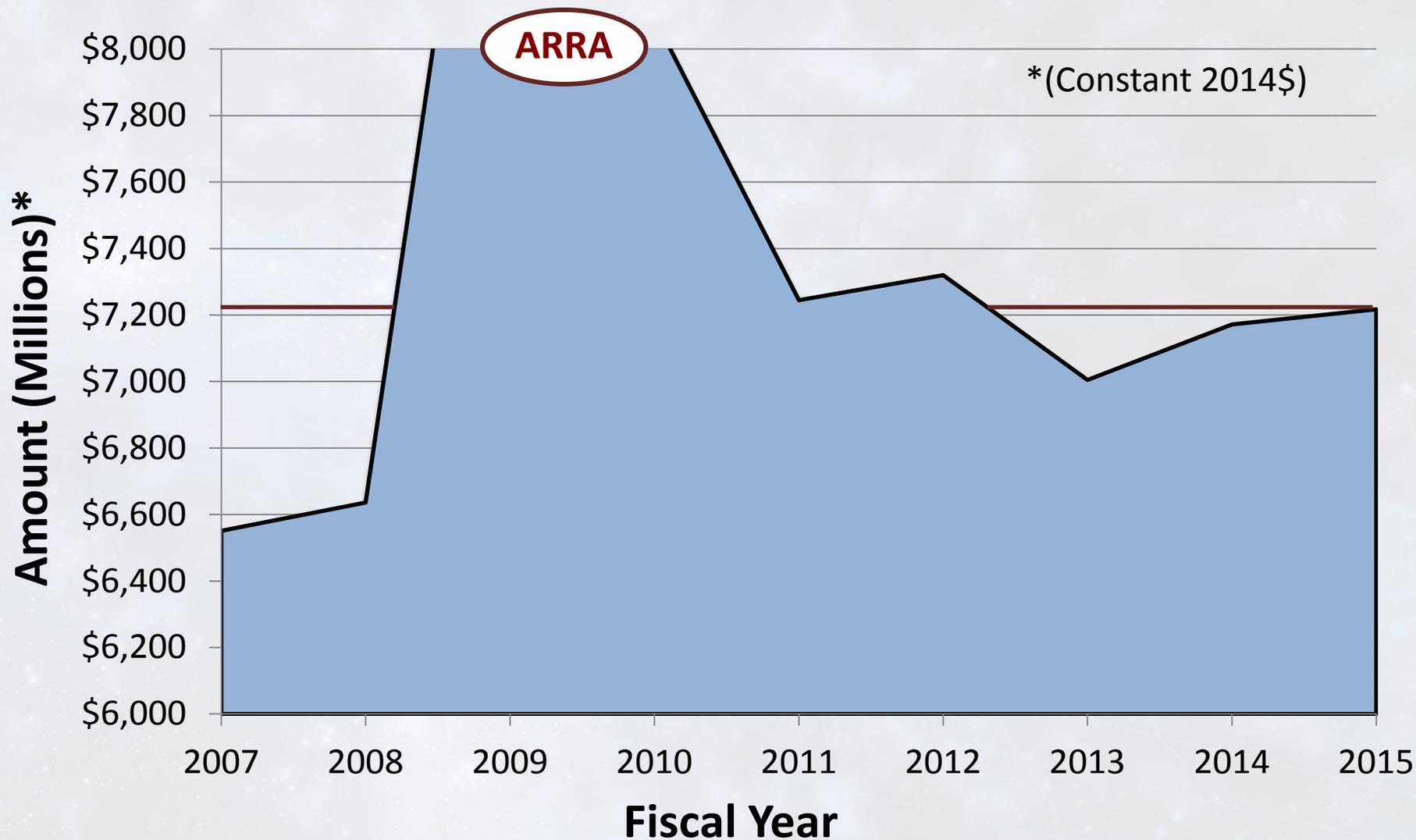
BUDGET REQUEST TO CONGRESS



NSF Funding History

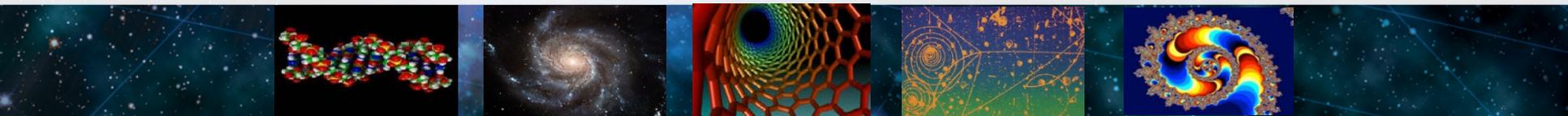
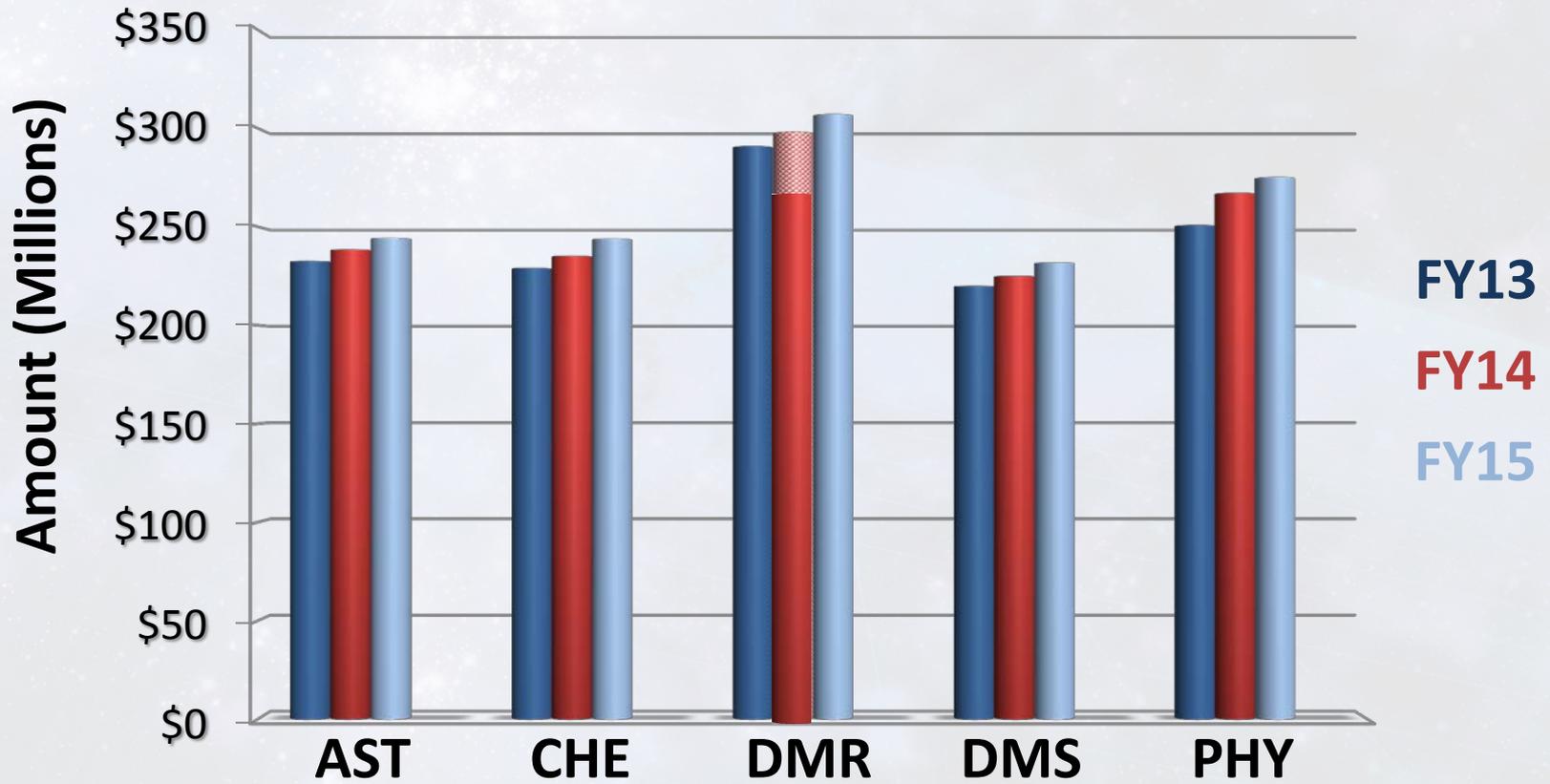


NSF Funding History



MPS Budgets

FY 2013 \$ 1250 M $\xrightarrow{+4.0\%}$ FY 2014 \$ 1300 M $\xrightarrow{+2.8\%}$ FY 2015 \$ 1337 M (estimate)



UNITED STATES
National Science Foundation

	FY 2015	FY 2016 (request)	
NSF	\$ 7344M	\$ 7724 M	5.2%
R&RA	\$ 5934 M	\$ 6186 M	4.2%

FY 2016

BUDGET REQUEST TO CONGRESS

UNITED STATES
National Science Foundation

FY 2016

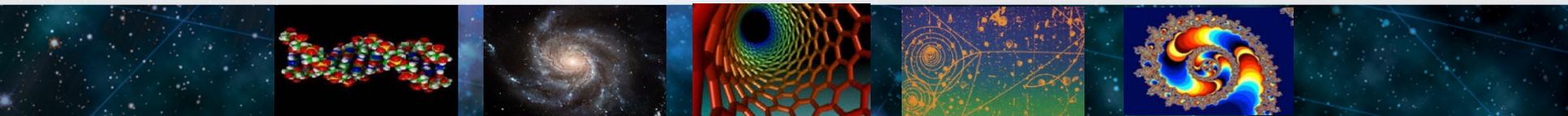
BUDGET REQUEST TO CONGRESS

MISSION: To promote the progress of science; to advance the national health, prosperity, and welfare; and to secure the national defense.

—From the National Science Foundation (NSF) Act of 1950 (PL. 81-507)

VISION: A Nation that creates and exploits new concepts in science and engineering and provides global leadership in research and education.

—From "Investing in Science, Engineering, and Education for the Nation's Future" NSF Strategic Plan for 2014-2018



FY 2016 Budget Request

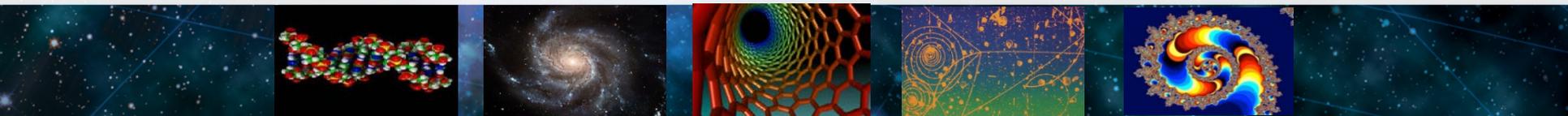
NSF Budget by Appropriation

(\$ in millions)

	FY 2015 Estimate	FY 2016 Request	Change
Research & Related Activities	\$ 5934	\$ 6186	4%
Education & Human Resources	866	963	11%
Major Research Equipment & Facilities Construction	201	200	-0.2%
Agency Operations & Award Management	325	355	9%
National Science Board	4	4	--
Office of Inspector General	14	15	5%
Total NSF	\$ 7344	\$ 7724	5%

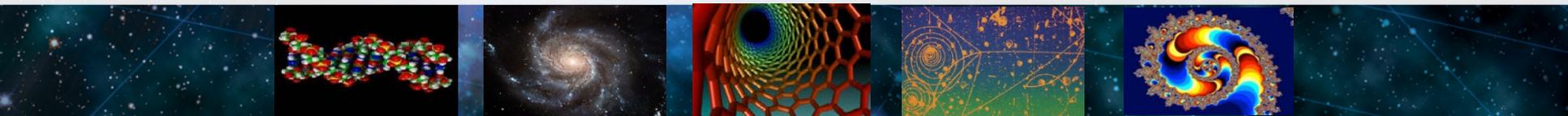
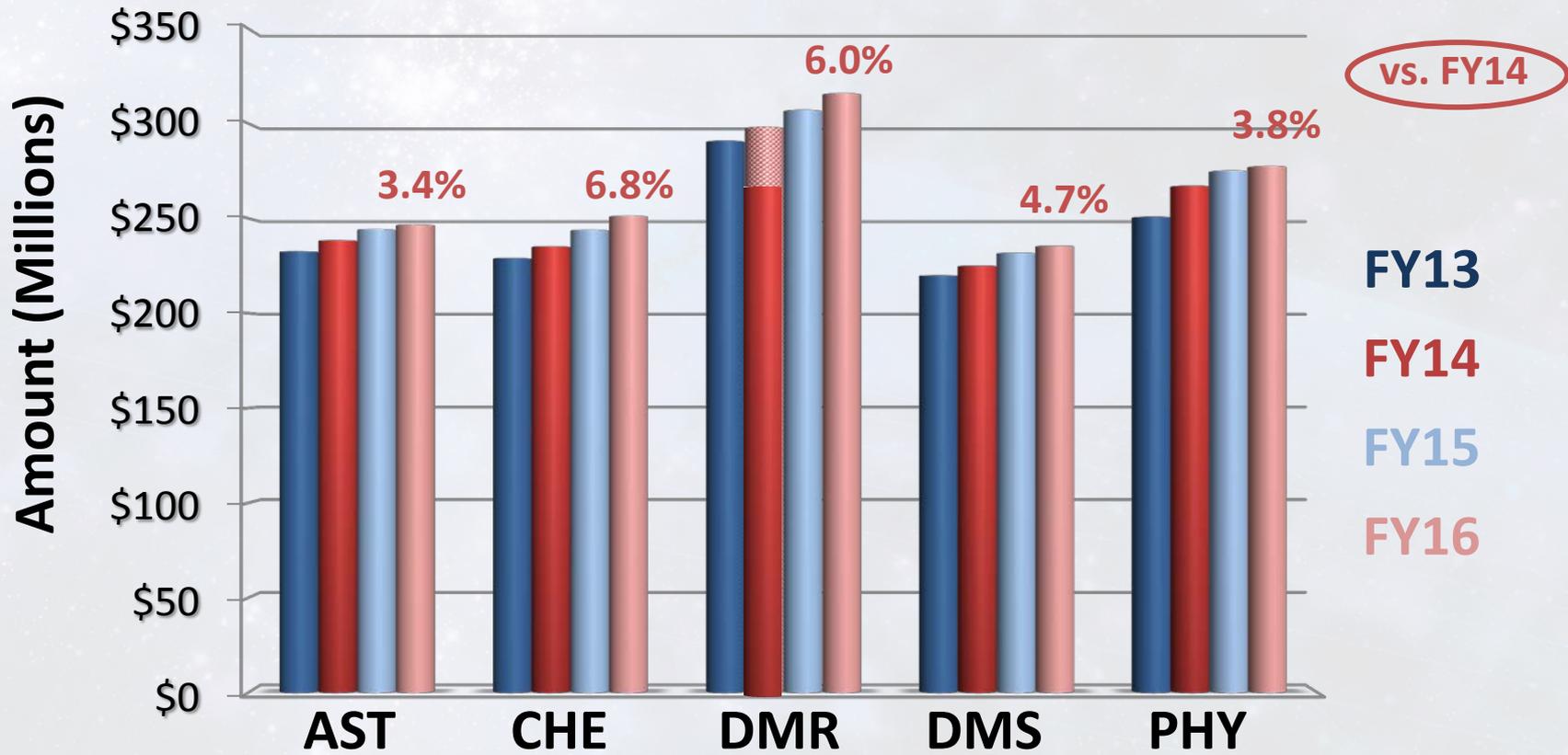
BUDGET REQUEST TO CONGRESS

—From "Investing in Science, Engineering, and Education for the Nation's Future" NSF Strategic Plan for 2014-2018

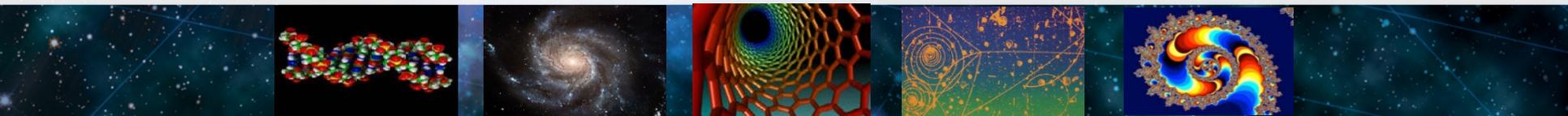
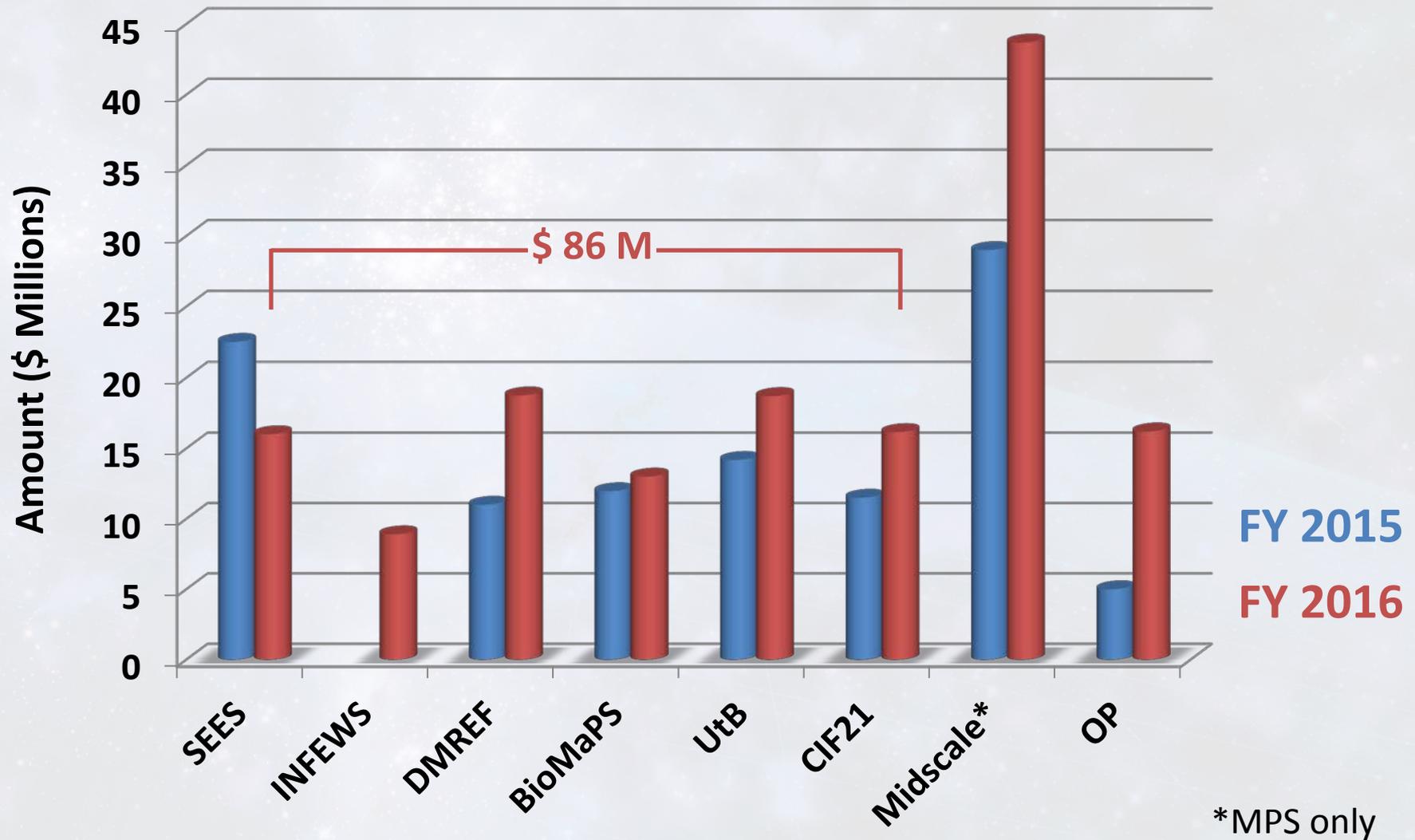


MPS Budgets

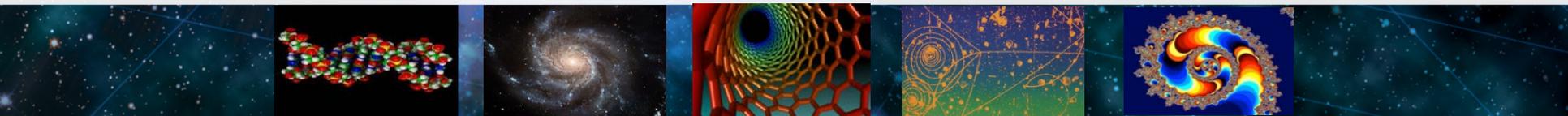
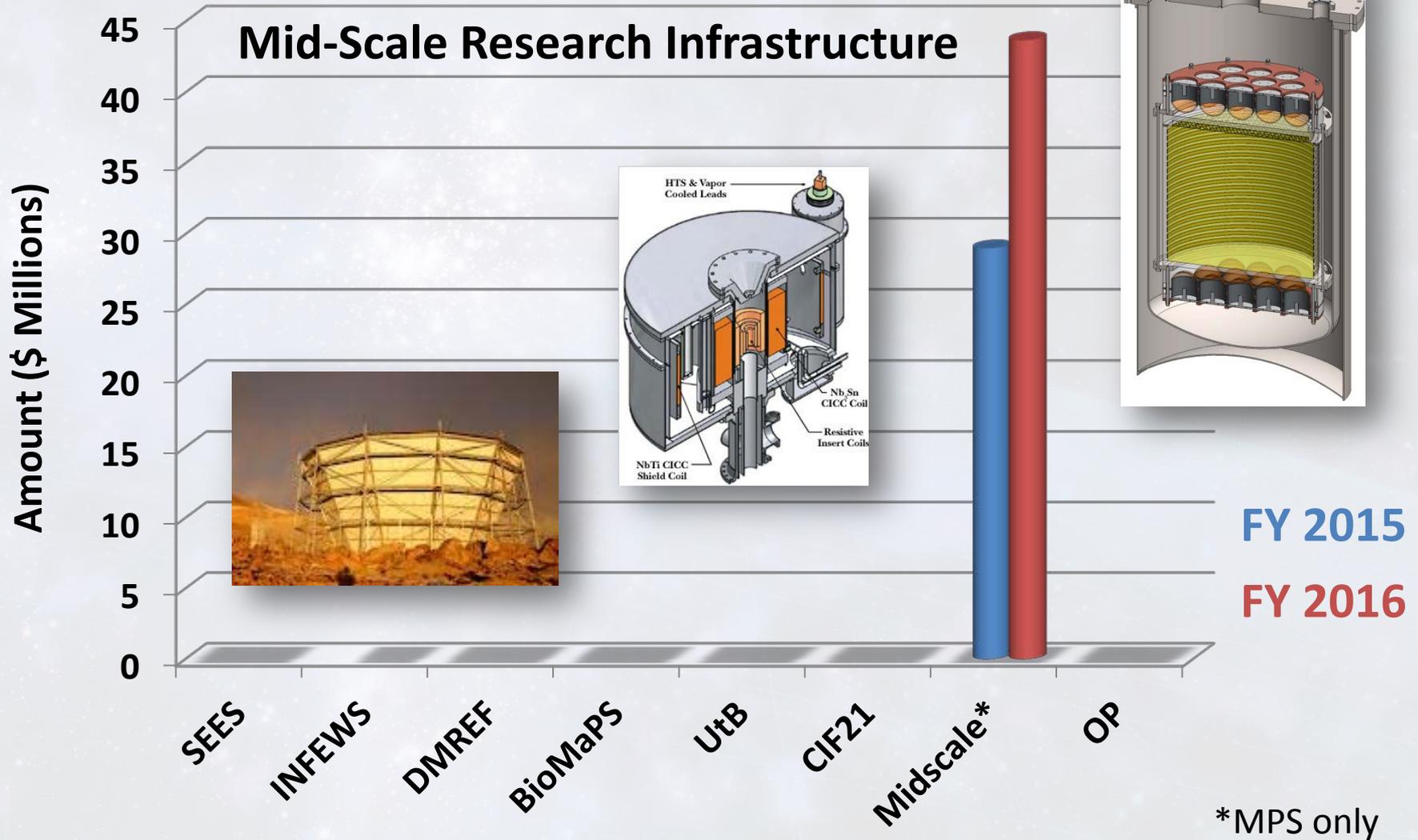
FY 2013 + 4.0% → **FY 2014** + 2.8% → **FY 2015** + 2.2% → **FY 2016**
\$ 1250 M → **\$ 1300 M** → **\$ 1337 M** → **\$ 1366 M**
 (estimate) (request)



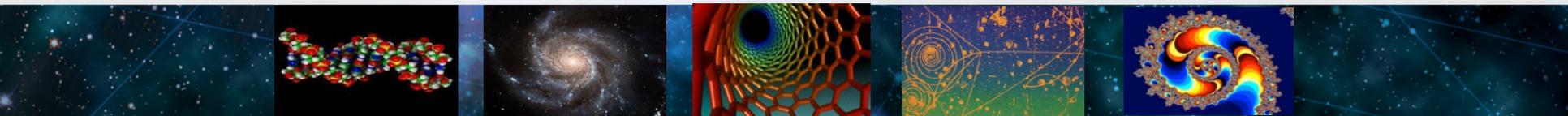
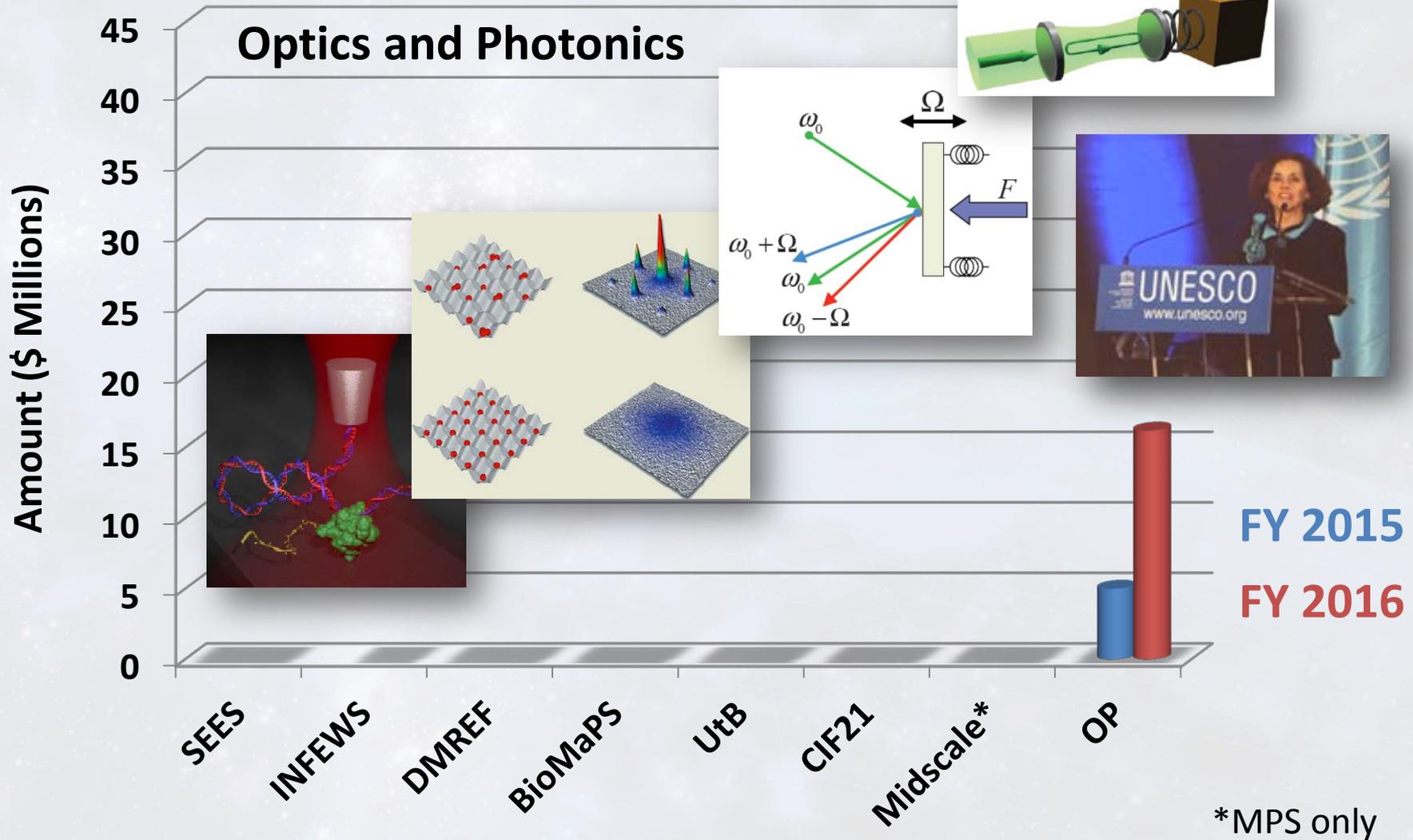
Selected MPS Major Investments



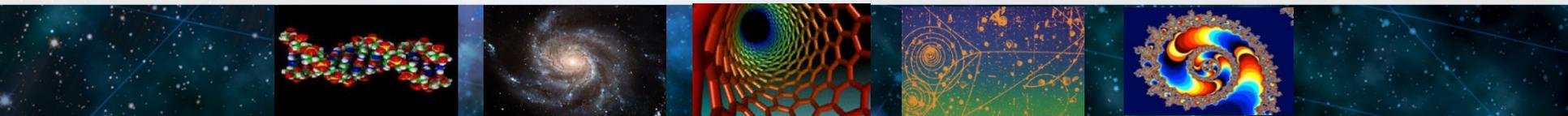
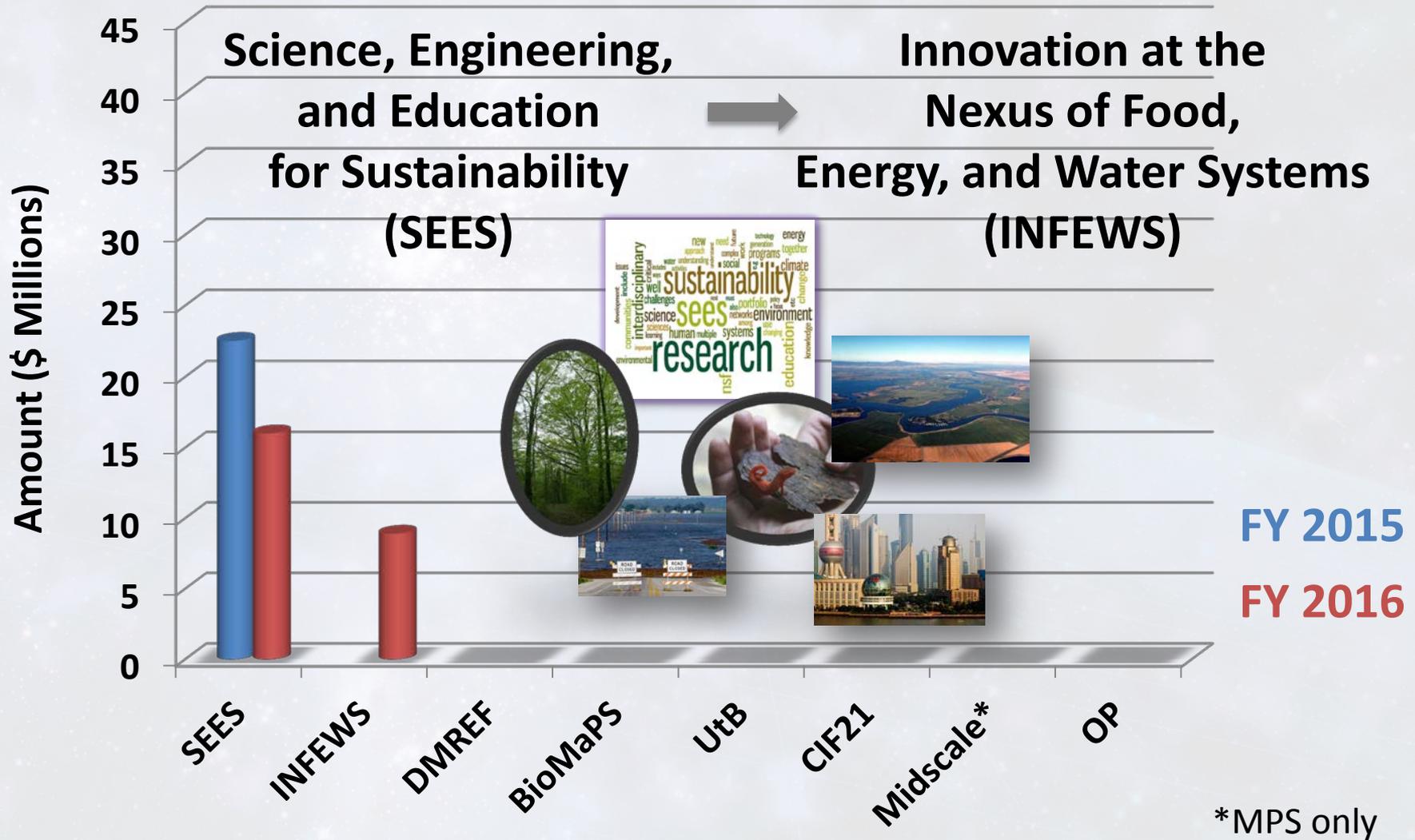
Selected MPS Major Investments



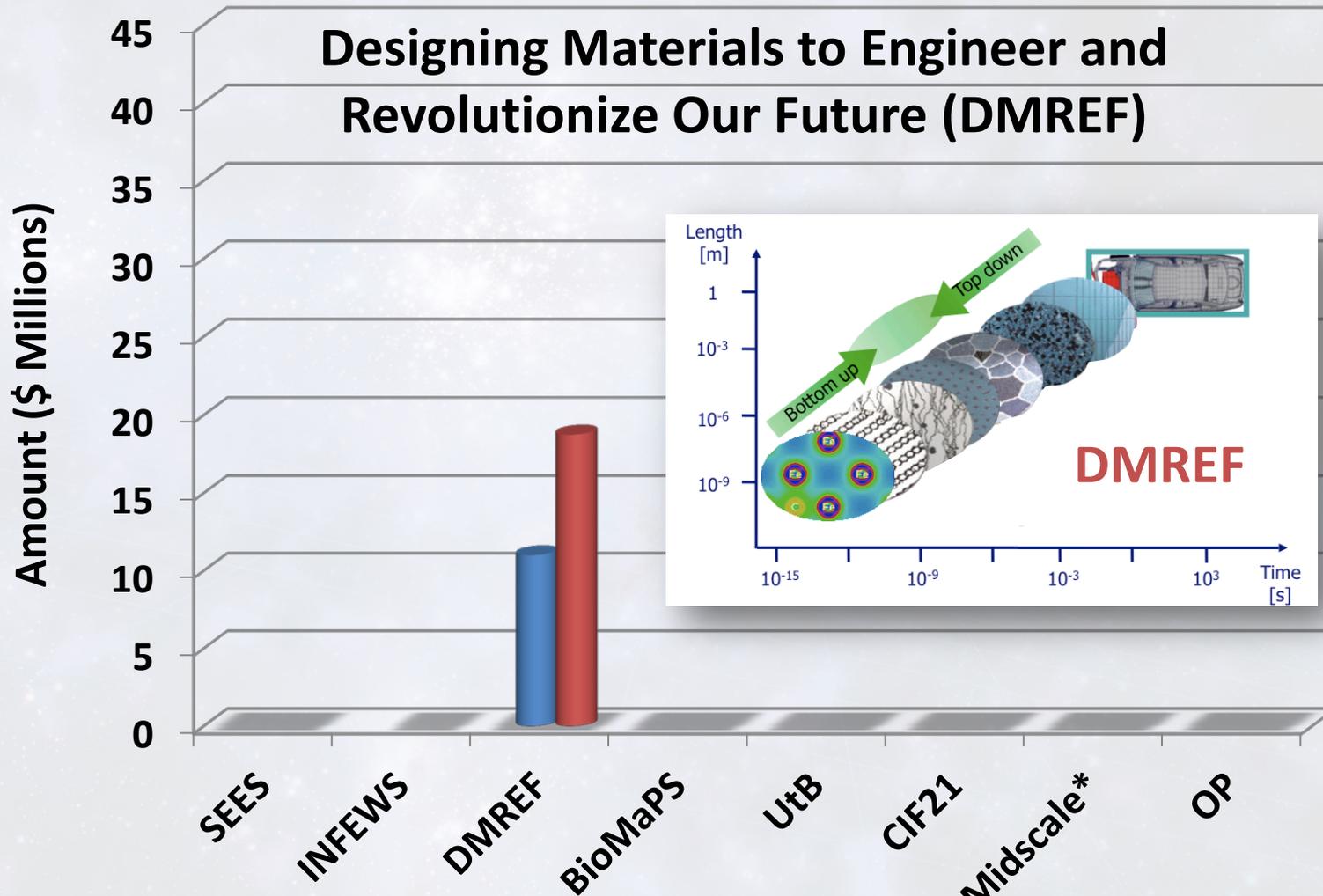
Selected MPS Major Investments



Selected MPS Major Investments



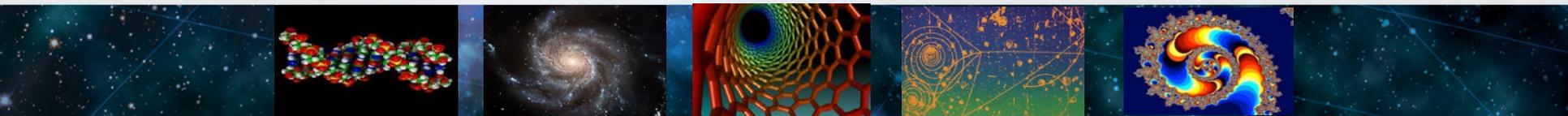
Selected MPS Major Investments



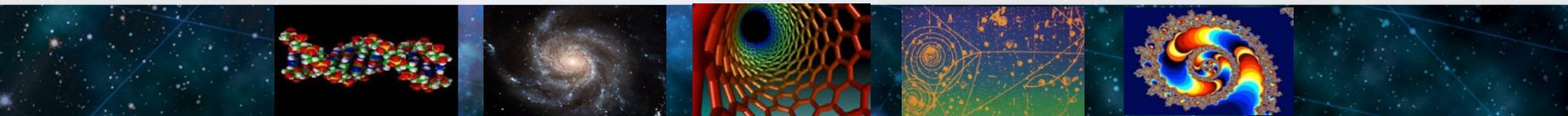
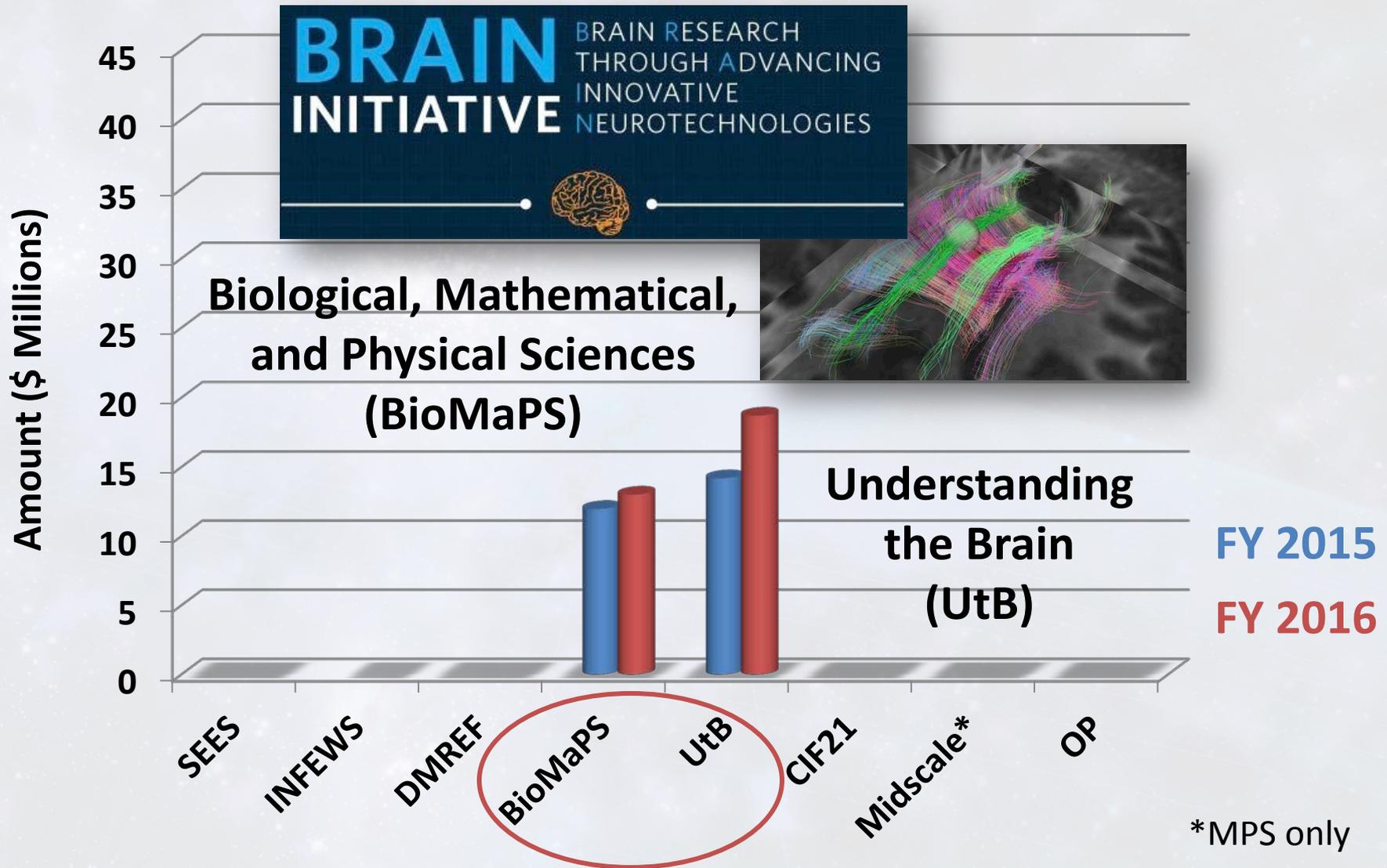
FY 2015

FY 2016

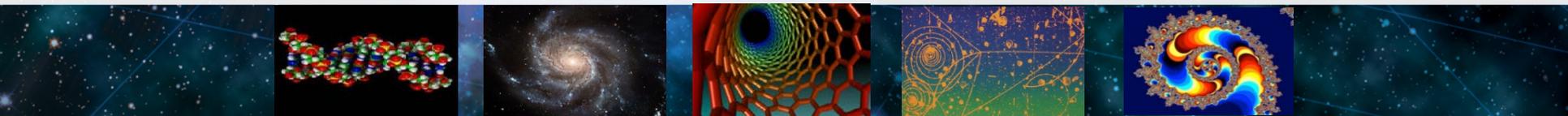
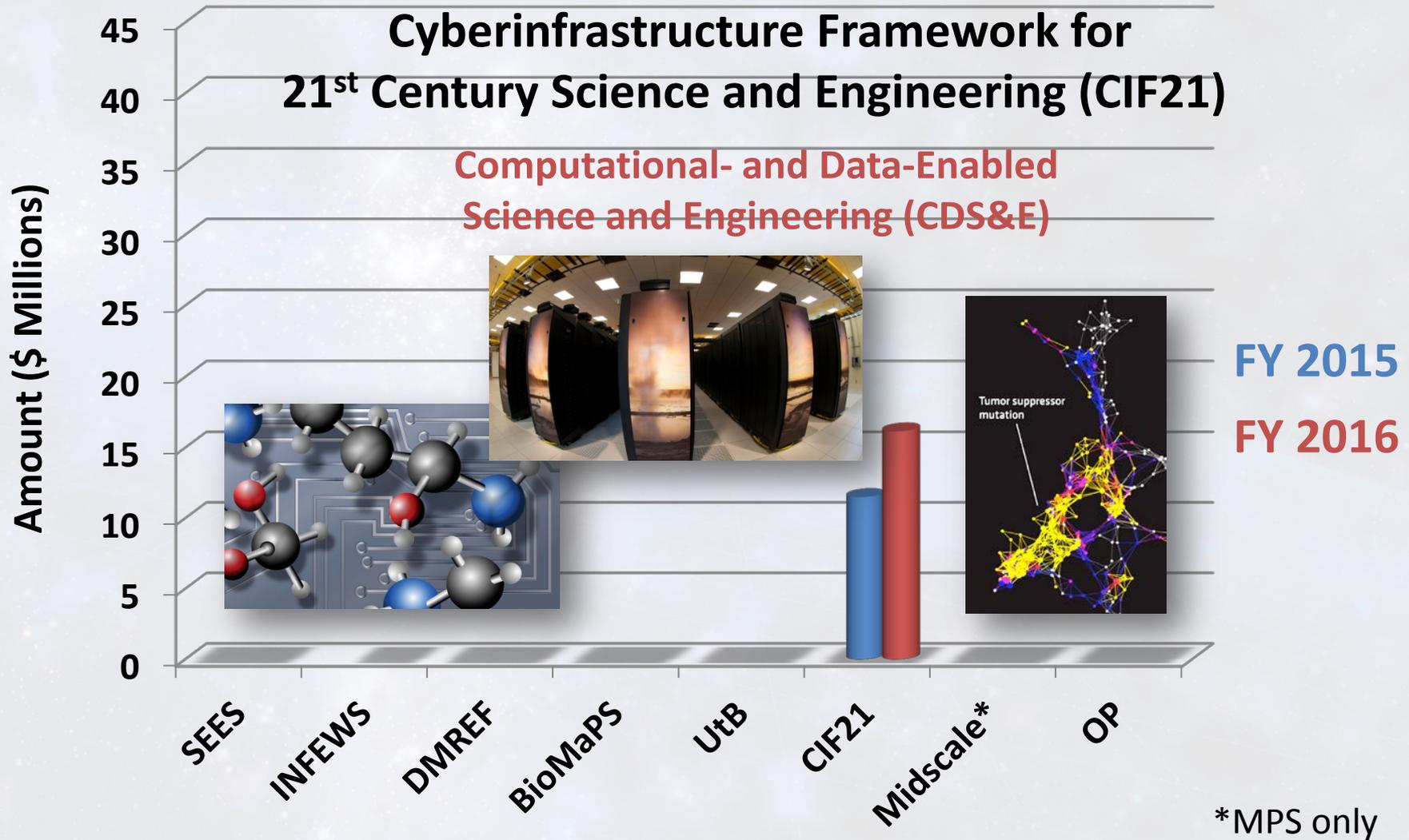
*MPS only



Selected MPS Major Investments



Selected MPS Major Investments



MPS Participation in NSF-Wide Initiatives

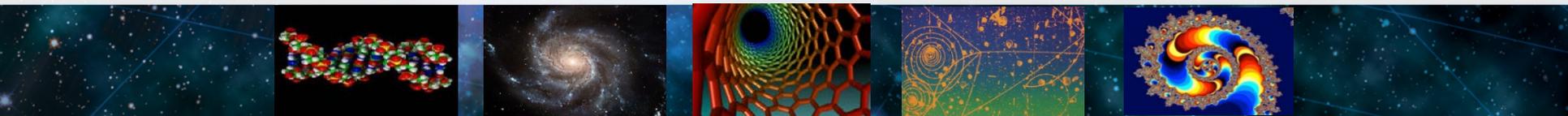
- **Cyber-Enabled Materials, Manufacturing, and Smart Systems**
 - **Cyberinfrastructure Framework for the 21st Century**
 - **Innovation Corps**
 - **INCLUDES**
 - **Innovation at the Nexus of Food, Energy, Water Systems**
 - **Science, Engineering, and Education for Sustainability**
 - **Secure and Trustworthy Cyberspace**
 - **Understanding the Brain**

**CEMMSS, CIF21, I-Corps, INCLUDES,
INFEWS, SEES, SaTC, UtB**

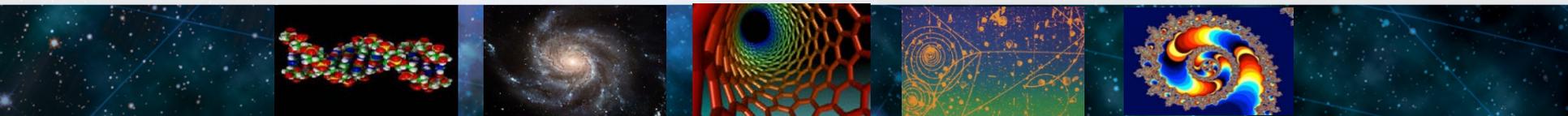
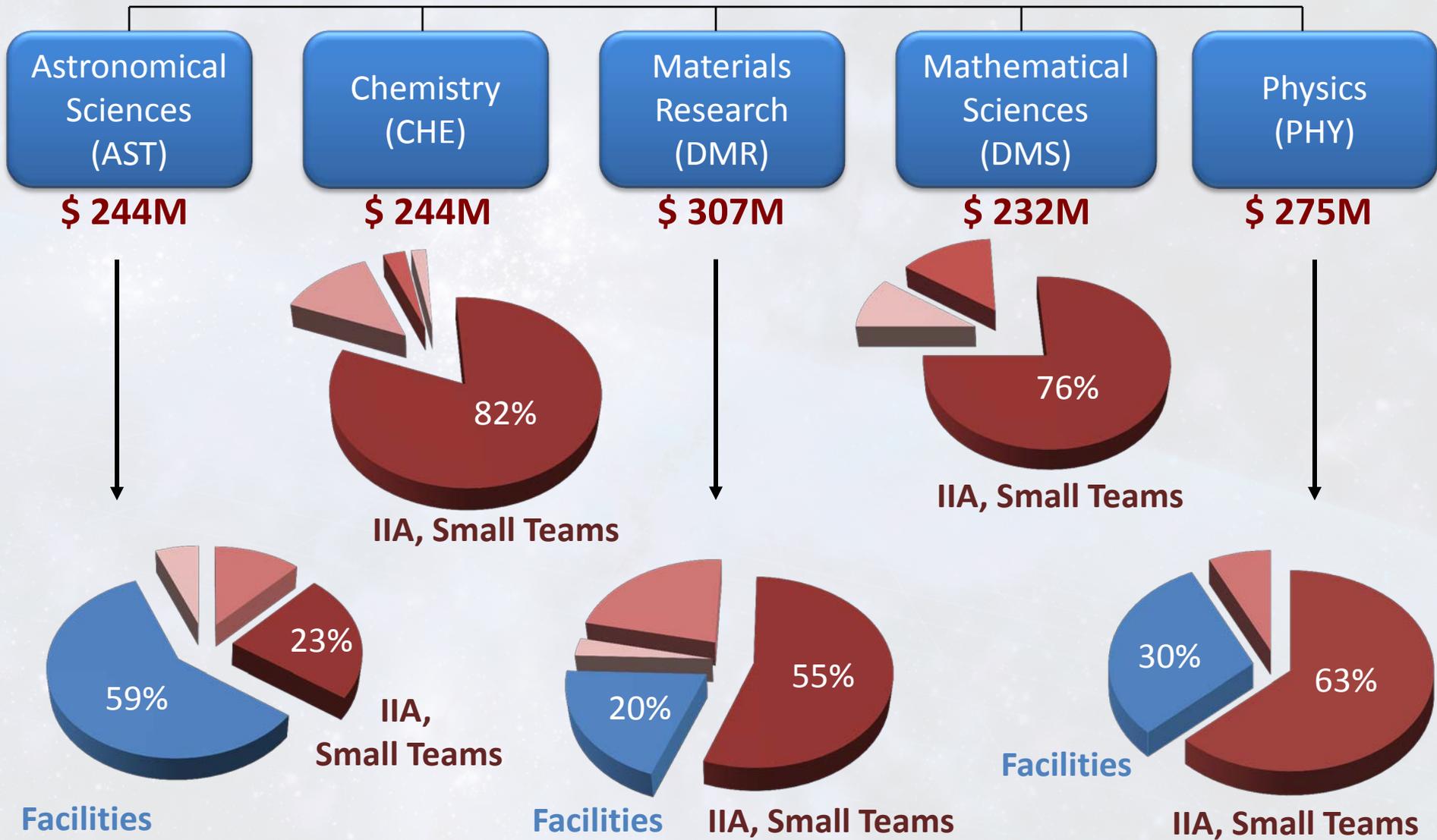
\$87.3M



6.4% of MPS Budget

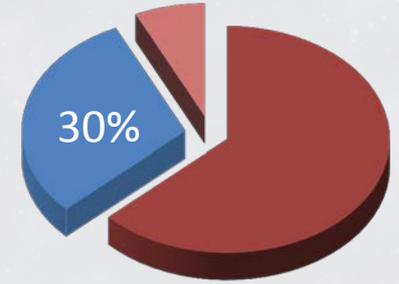
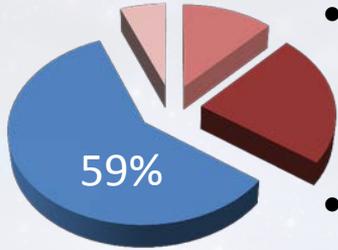


FY 2015 Estimate: \$ 1337M



Astronomy (AST)

- Arecibo Observatory
- Atacama Large Millimeter Array (ALMA)
- Daniel K. Inouye Solar Telescope (DKIST (ATST))
- Gemini Observatory
- Large Synoptic Survey Telescope (LSST)
- National Optical Astronomy Observatory (NOAO)
- National Radio Astronomy Observatory (NRAO)
- National Solar Observatory (NSO)

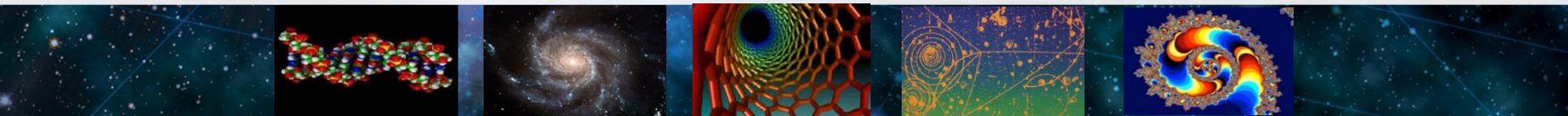
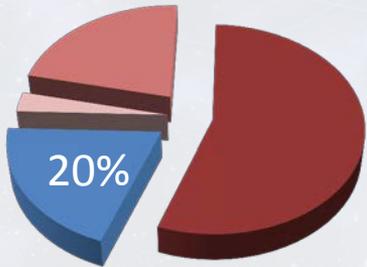


Physics (PHY)

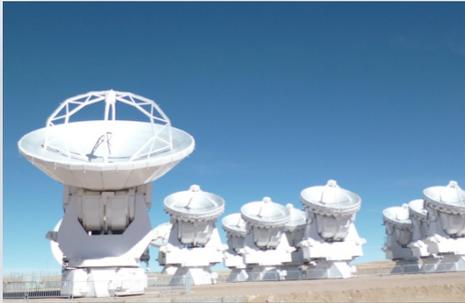
- Ice Cube Neutrino Observatory
- Large Hadron Collider (LHC)
- Laser Interferometer Gravitational Wave Observatory (LIGO)
- National Superconducting Cyclotron Laboratory (NSCL)

Materials Research (DMR)

- Cornell High Energy Synchrotron Source (CHESS)
- National High Magnetic Field Laboratory (NHMFL)
- Center for High Resolution Neutron Scattering (CHRNS)



Examples of MPS-Supported Multi-user Facilities



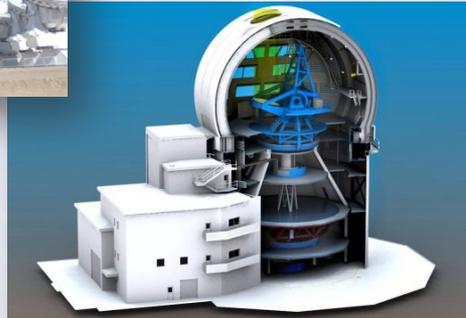
ALMA



Gemini



NOAO



DKIST

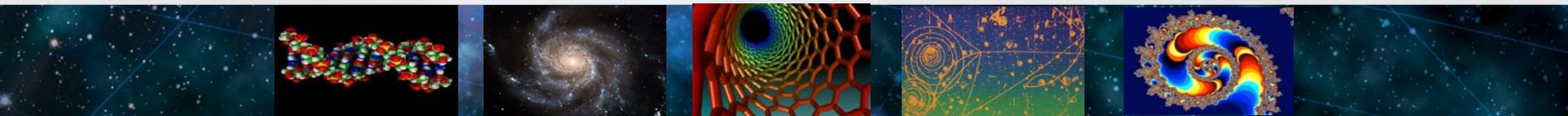


IceCube



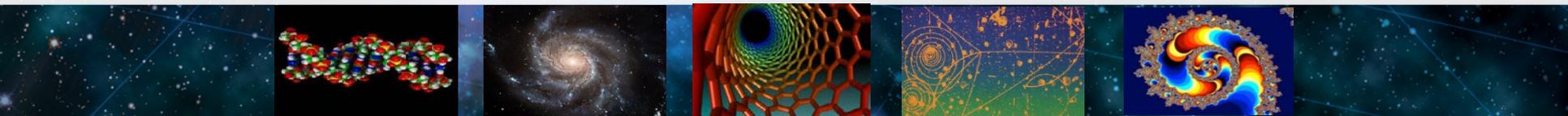
NHMFL

LIGO

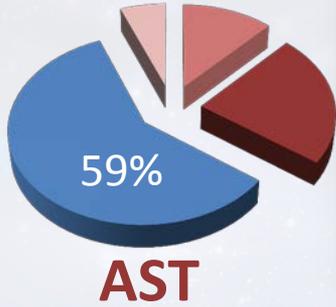


Two Different Budget Lines for Facilities

NSF FY 2016 Request (\$ in millions)	FY 2016 Request
Research & Related Activities	\$ 6186
Education & Human Resources	963
Major Research Equipment & Facilities Construction	200
Agency Operations & Award Management	355
National Science Board	4
Office of Inspector General	15
Total NSF	\$ 7,724



Two Different Budget Lines for Facilities



AST

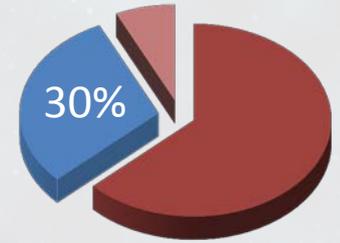


ALMA

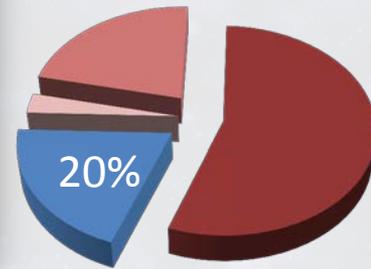
Operations (R&RA)



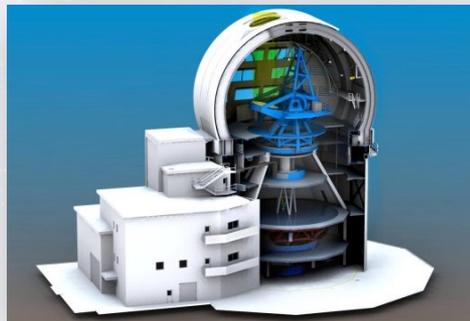
IceCube



PHY

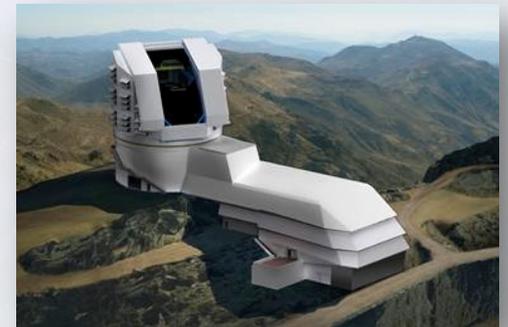


DMR

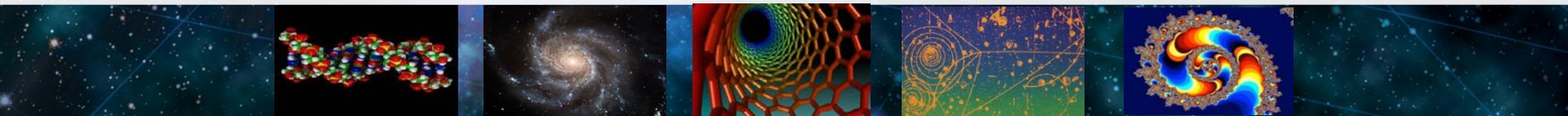


DKIST

Major Research Equipment and Facilities Construction (MREFC)



LSST



Building the STEM Pipeline Through MPS Research

CAREER Young Teacher-Scholars

	FY 2015 Estimate	FY2016 Request
MPS	\$ 67M	\$ 70M
NSF	\$ 223M	\$ 232M

30% of CAREER funding from MPS

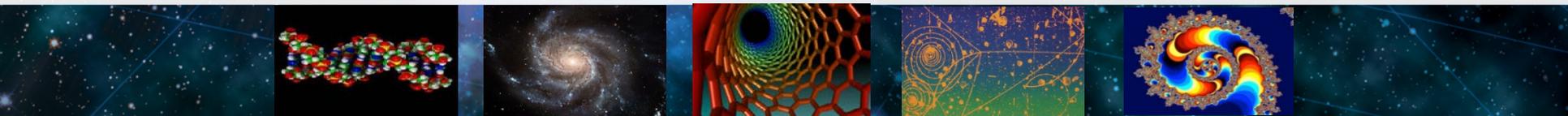
Research Experiences for Undergraduates (REU) Undergraduate Research Programs



	FY 2014 Estimate	FY2015 Request
MPS	\$ 21.2M	\$ 20.8M
NSF	\$ 73.2M	\$ 77.6M



27% of REU funding from MPS



Building the STEM Pipeline Through MPS Research

Alliances for Graduate Education and the Professoriate (AGEP)
Supplements to support under-represented graduate students



AGEP

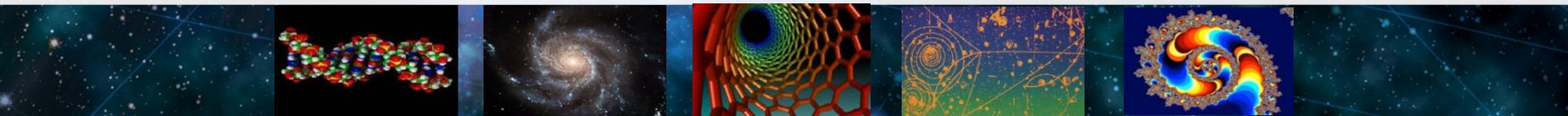
Alliances for Graduate Education and the Professoriate

FY 2012: 27

FY 2013: 39

FY 2014: 42

MPS Graduate Research Supplements for Veterans (MPS-GRSV)
FY 2015 Dear Colleague Letter (NSF 15-024)



Fundamental Research in the Mathematical and Physical Sciences

Advancing Discovery

Building Blocks for Innovation

Forefront Facilities

Inspiring the Next Generation

