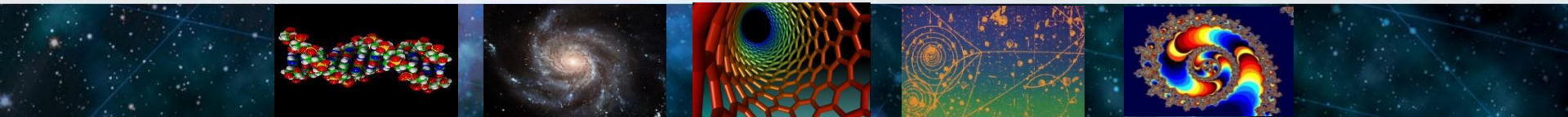
FY 2015 Budget Request

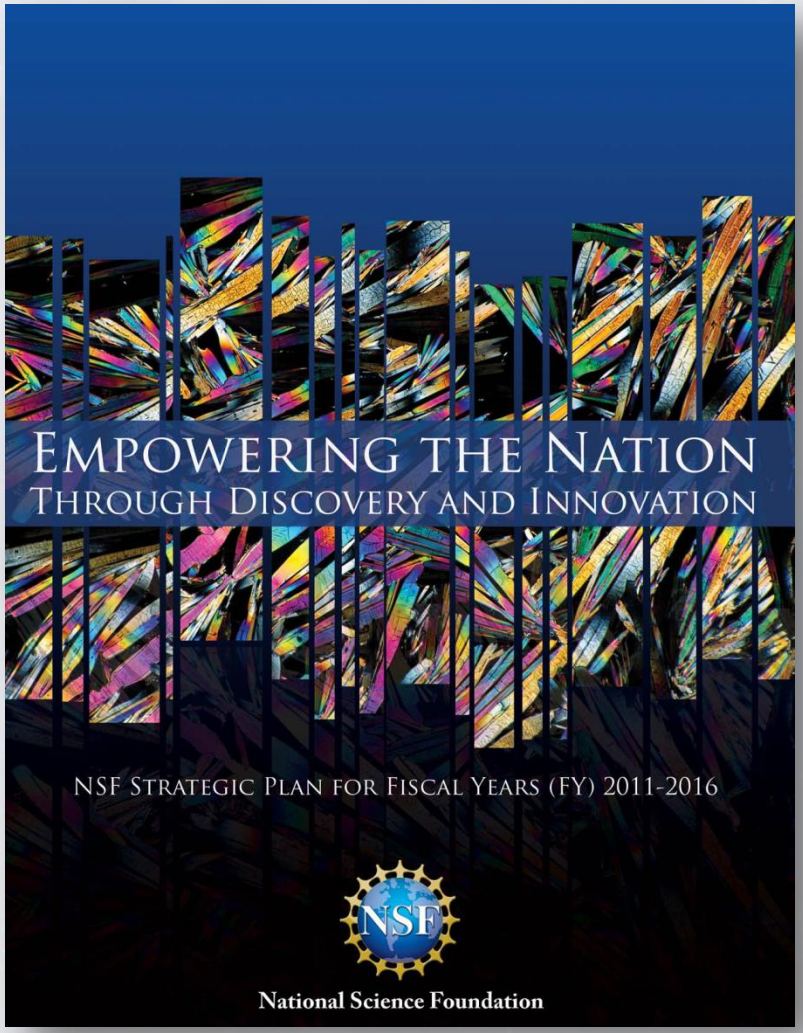
National Science Foundation
Directorate for Mathematical and Physical Sciences

F. Fleming Crim
Assistant Director for
Mathematical and Physical Sciences

March 10, 2014



NSF Core Mission: Fundamental Research



NSF Strategic Goals

Transform the Frontiers

Innovate for Society

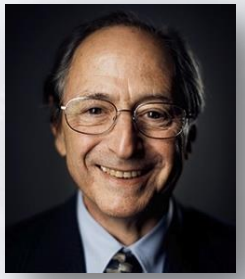
Perform as a Model Organization

The Excitement of Advancing Discovery

Chemistry Nobel Laureates

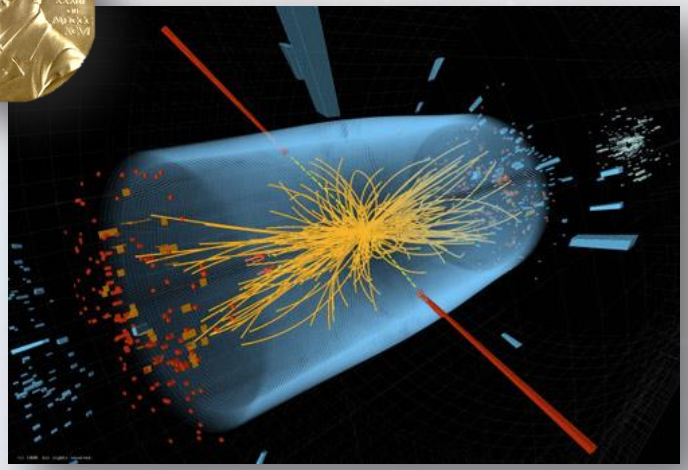
Warshel

Karplus



Levitt

Higgs Particle
LHC



Physics World
"Discovery of the Year"
2012

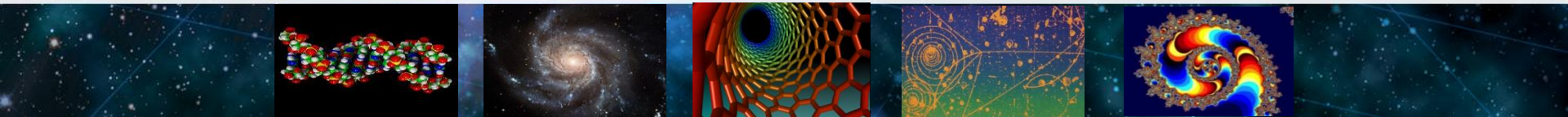
MPS-Supported MacArthur Fellows

Baran	Fennie	Katabi	Murphy	Rey	Seager
(CHE)	(DMR)	(AST)	(DMS)	(PHY)	(AST)

Katabi

Rey

Fennie



The Excitement of Advancing Discovery

Chemistry Nobel Laureates

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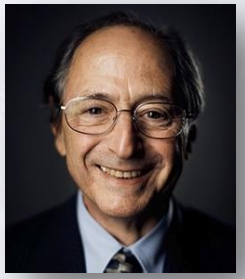


Levitt

MPS-Supported MacArthur Fellows

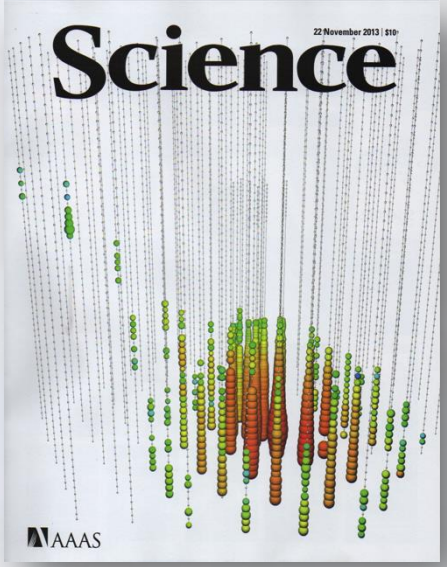
Baran (CHE) Fennie (DMR) Katabi (AST) Murphy (DMS) Rey (PHY) Seager (AST)

Katabi

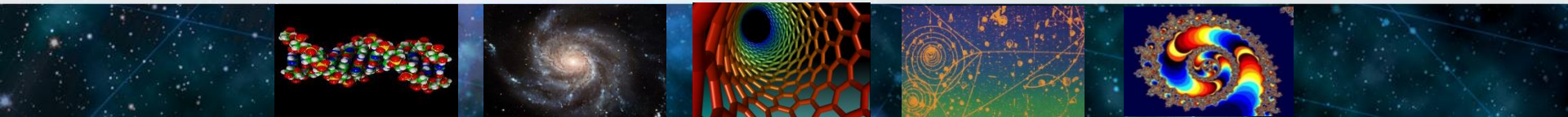
Rey

Fennie

High Energy Neutrinos Ice Cube

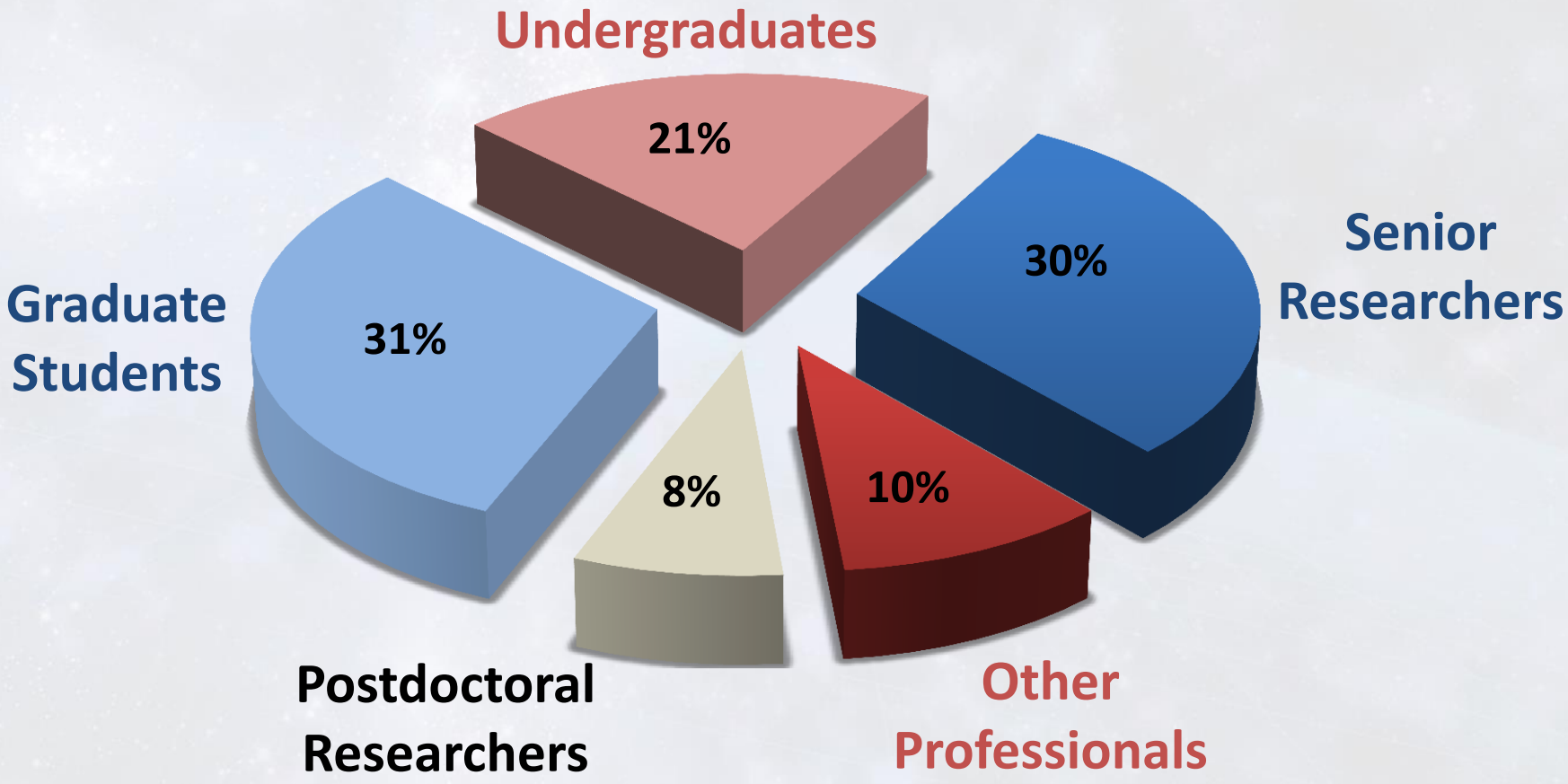


Physics World
"Discovery of the Year"
2013



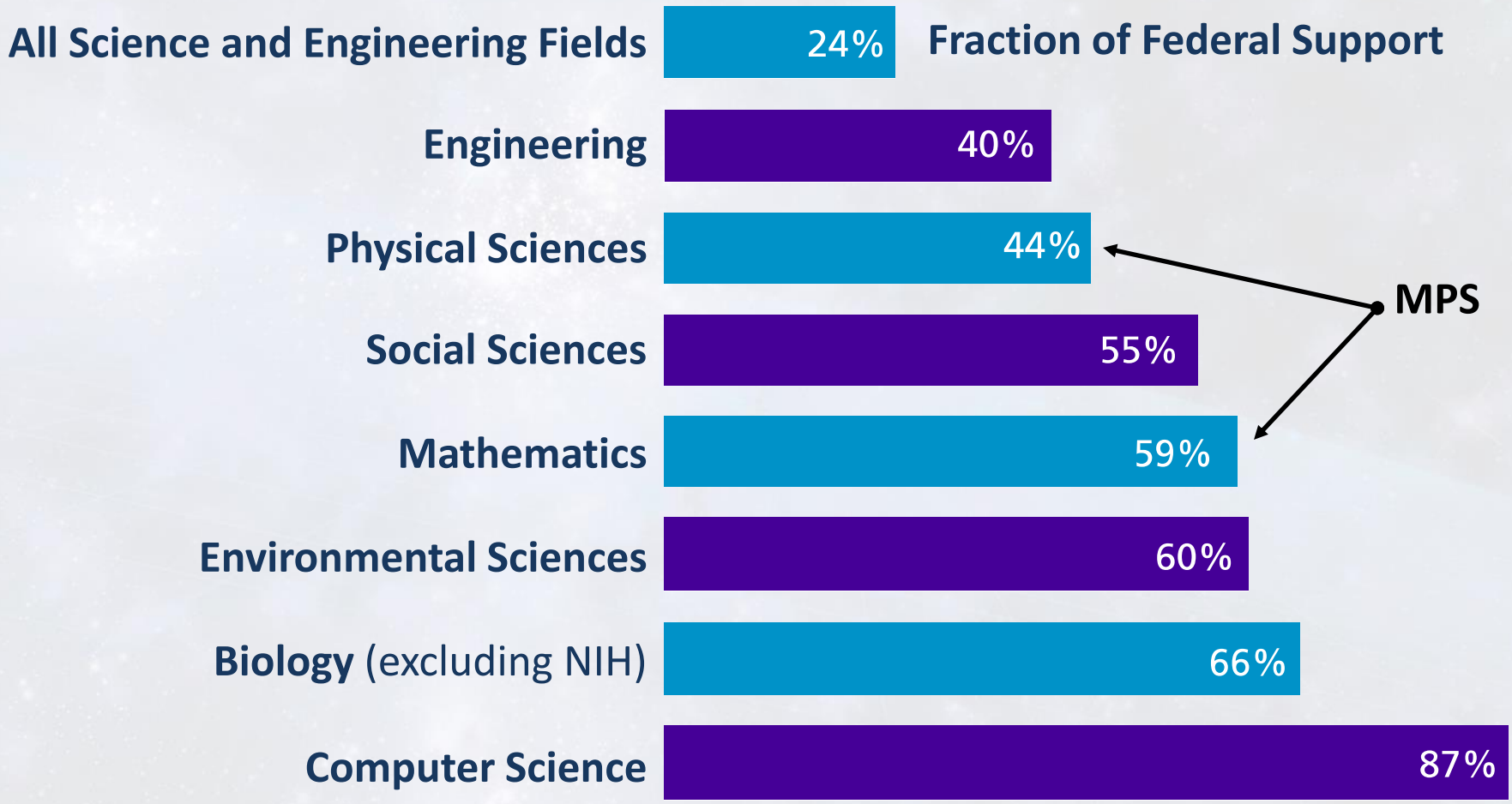
People Do Science

29,000 People in MPS Activities*



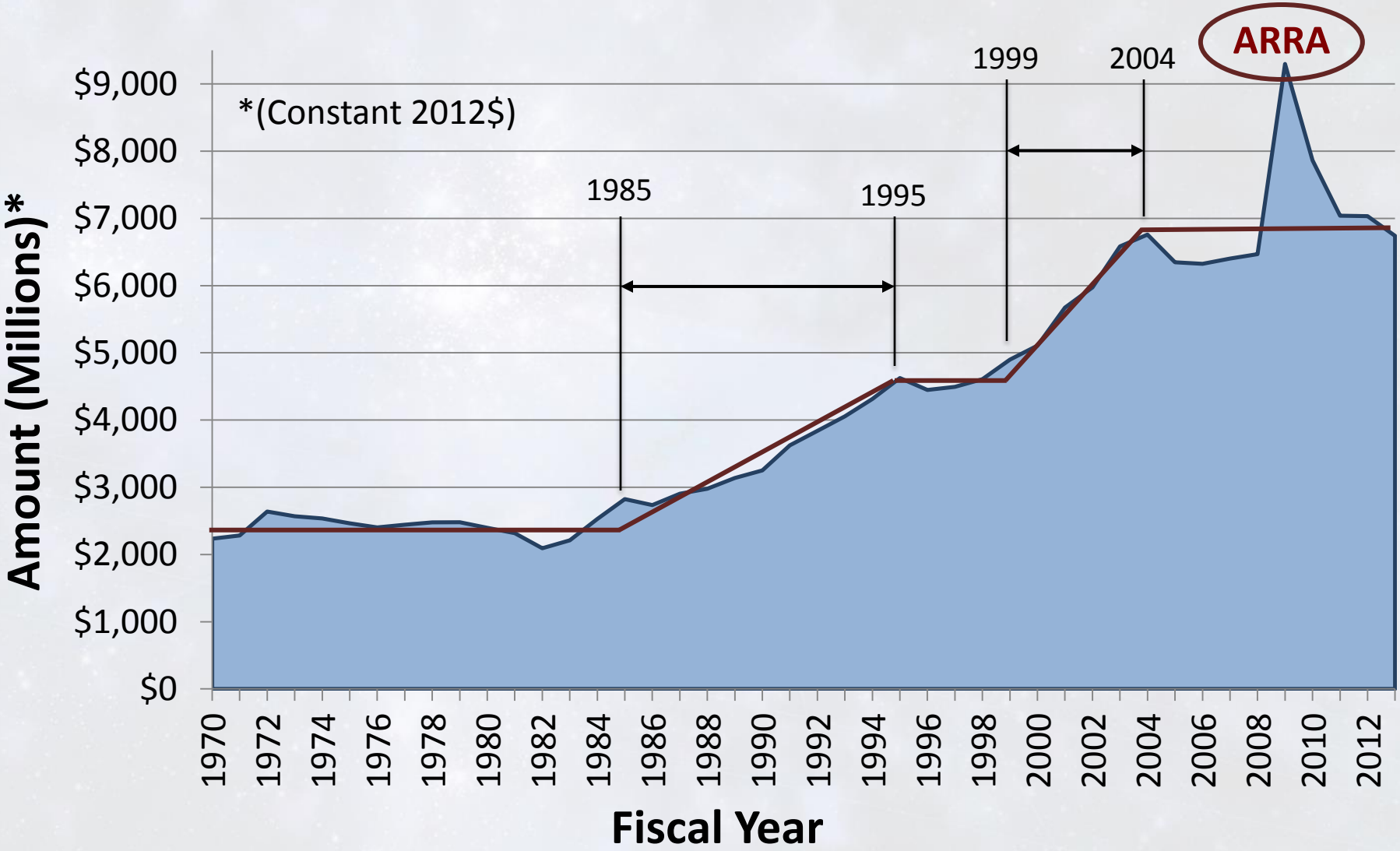
*Estimated for FY 2015

NSF Supports Academic Basic Research



Source: NSF/ Center for National Science and Engineering Statistics, FY 2011

NSF Funding History

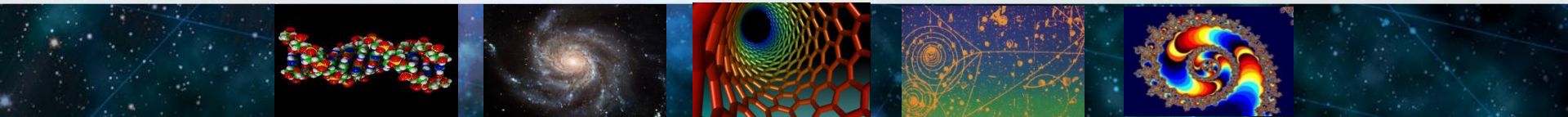


FY 2015 Budget Request

NSF Budget by Appropriation
($ in millions)

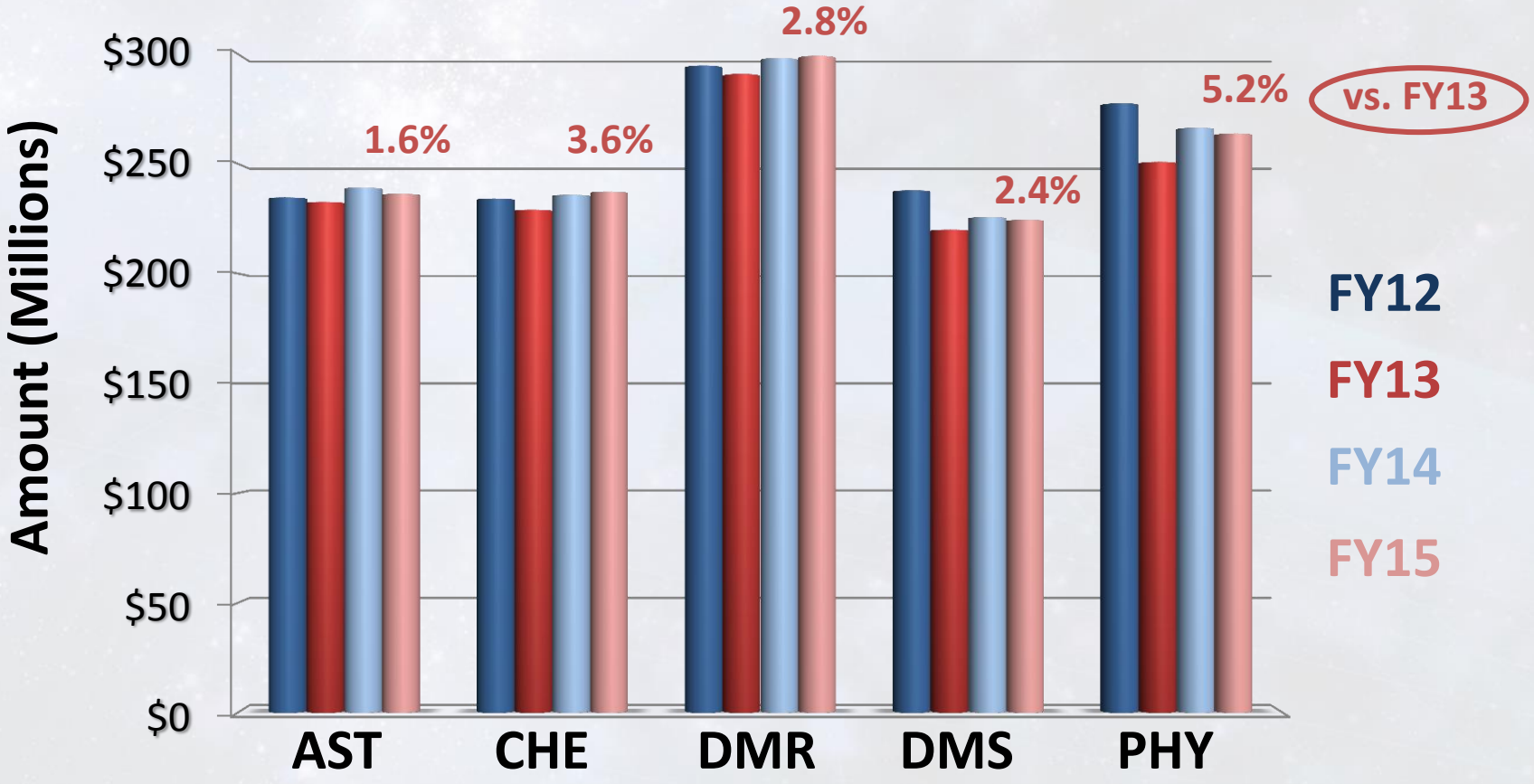
	FY 2015 Request	Change from FY 2014	
Research & Related Activities	$ 5,807	$ -1	-0.03%
Education & Human Resources	890	43	5.1%
Major Research Equipment & Facilities Construction	201	1	0.4%
Agency Operations & Award Management	338	40	13.5%
National Science Board	4	*	1.6%
Office of Inspector General	14	*	1.6%
Total NSF	**$ 7,255**	**$ 83**	**1.2%**
Opportunity, Growth, and Security Initiative	**$ 552**		

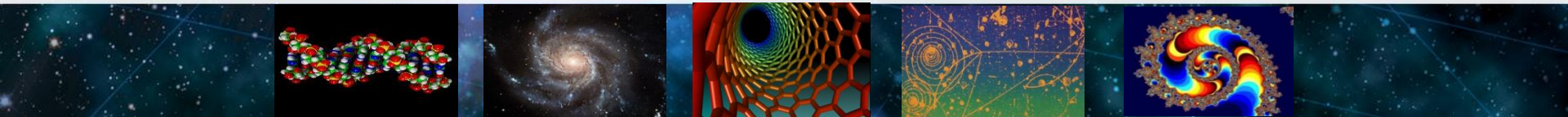
(* Denotes < $ 0.5 M)



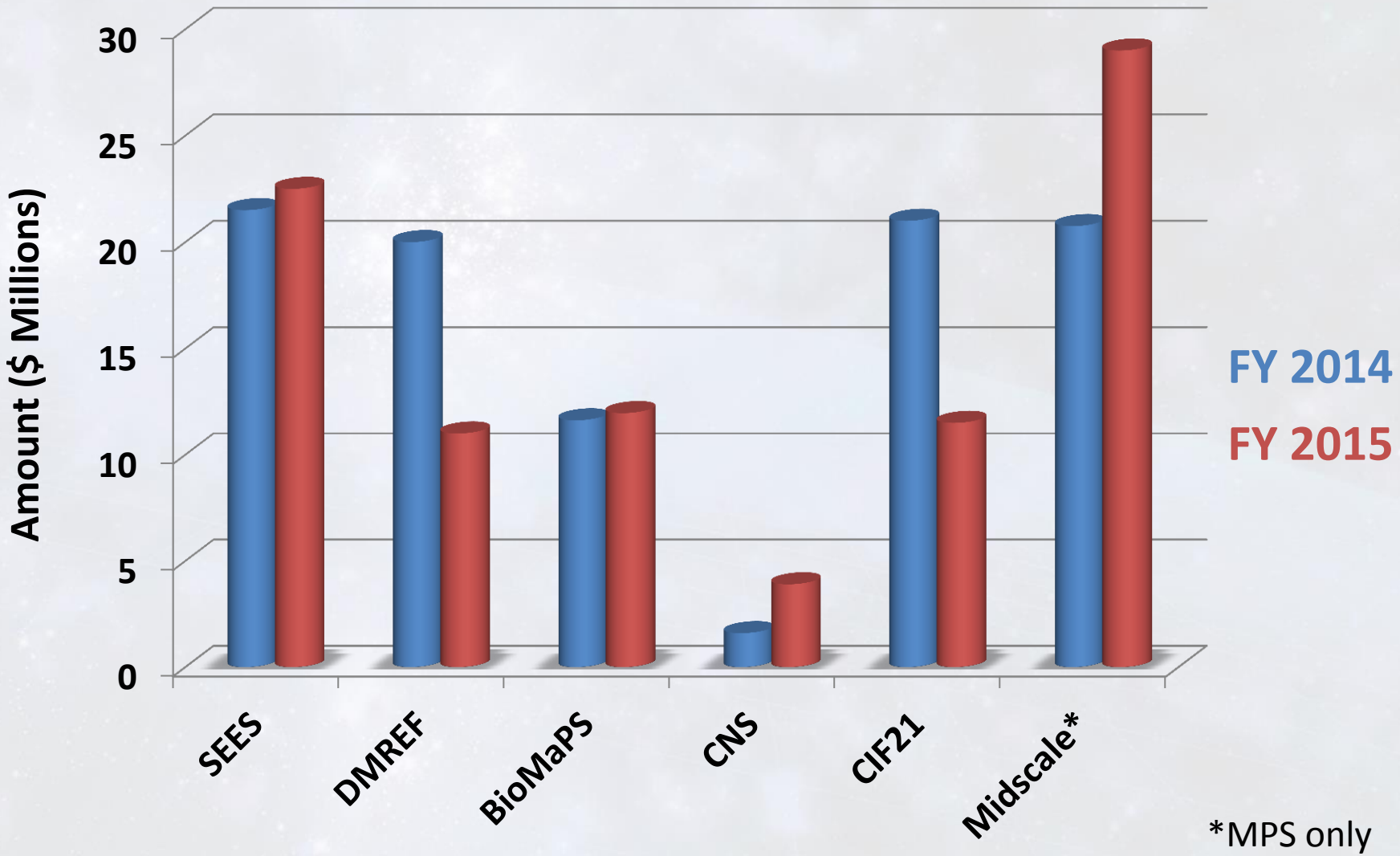
MPS Budgets

FY 2012 $ 1309 M → – 4.5% → FY 2013 $ 1250 M → +4.0% → FY 2014 $ 1300 M (estimate) → -0.3% → FY 2015 $ 1296 M (request)

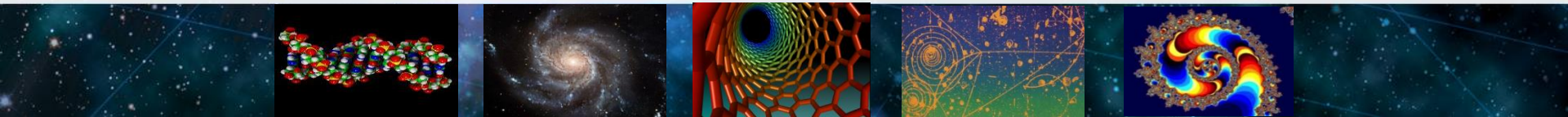




Selected MPS Major Investments



*MPS only



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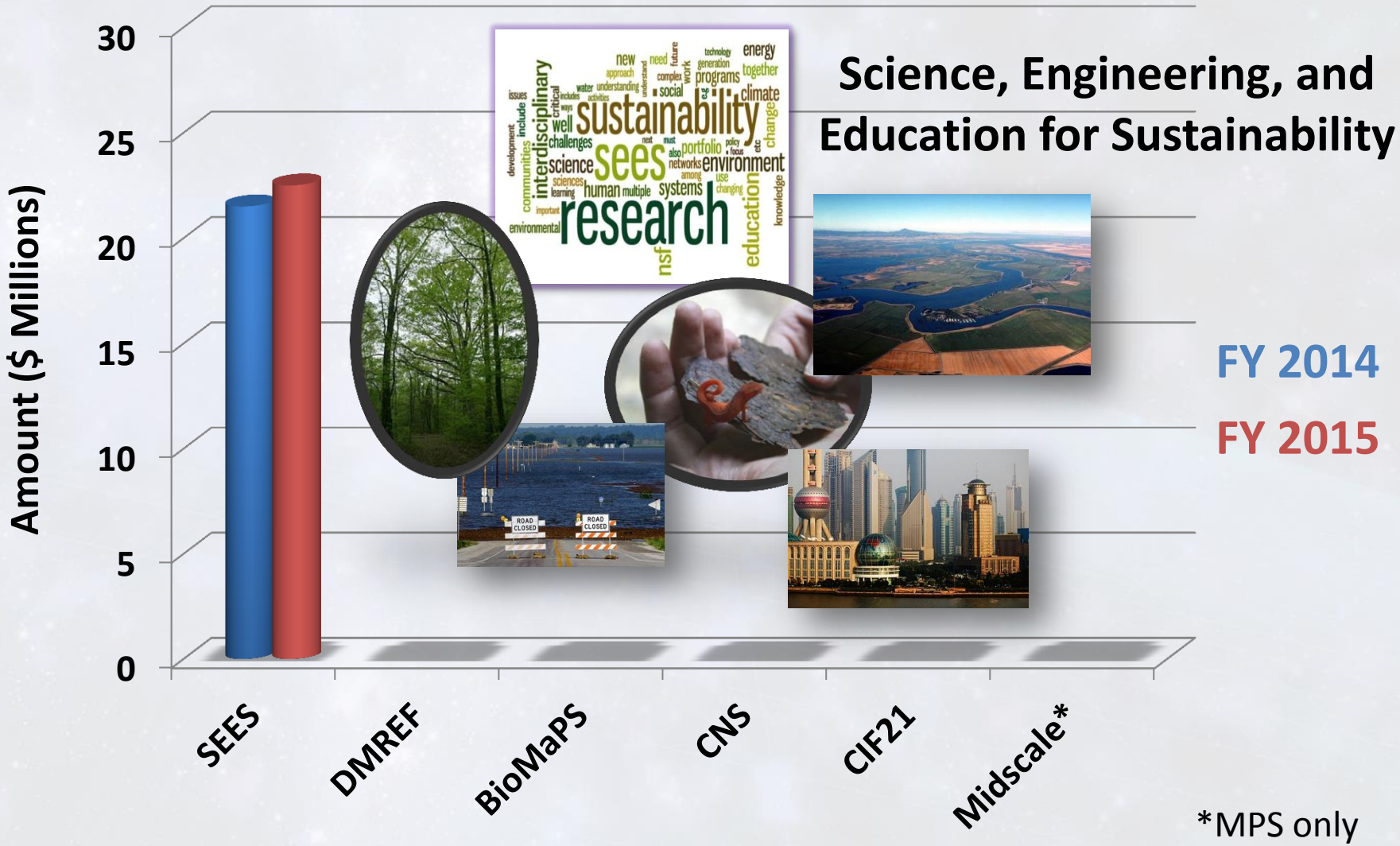

*MPS only

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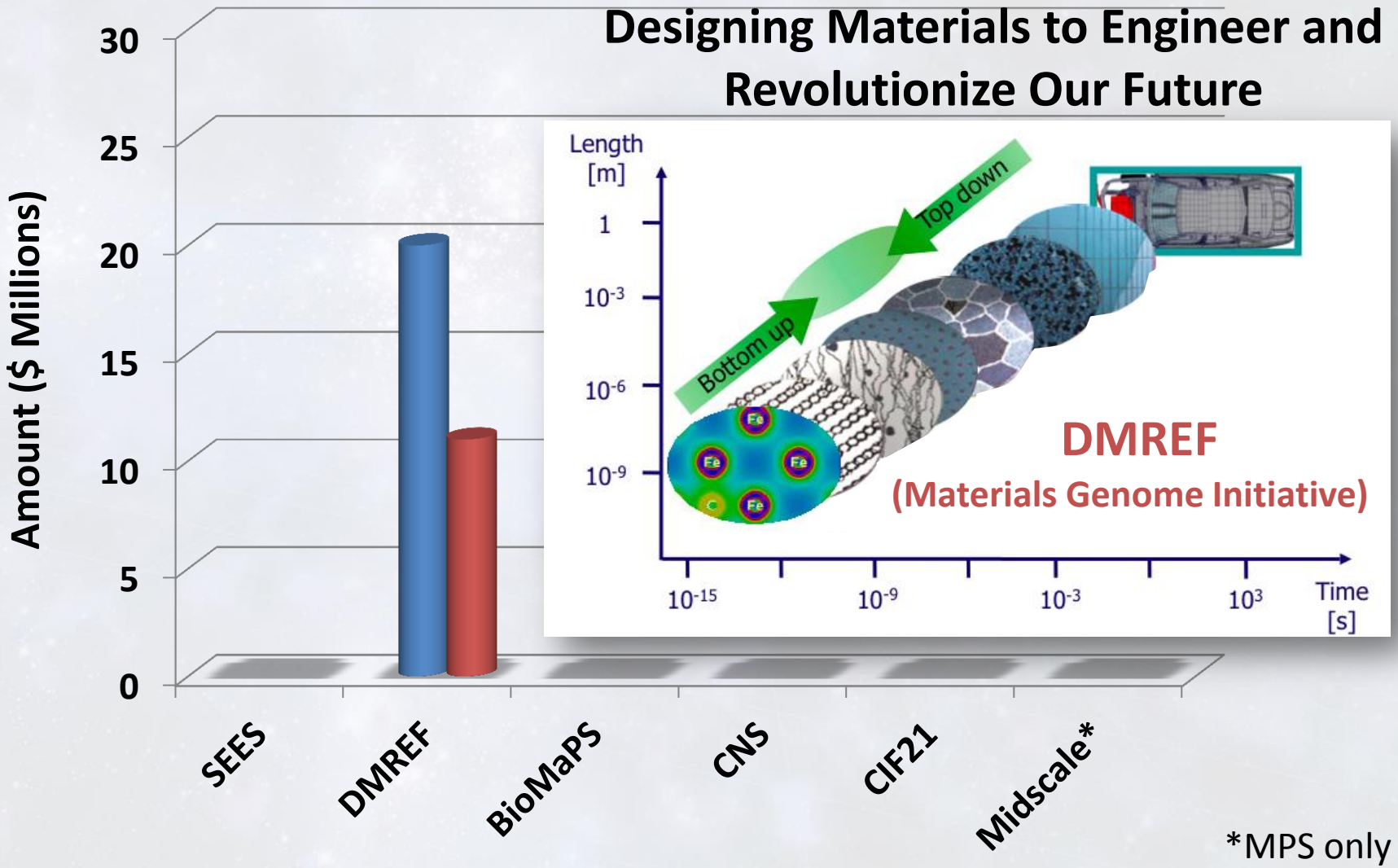
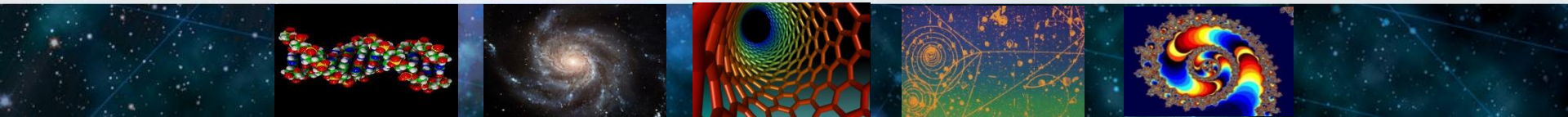


*MPS only



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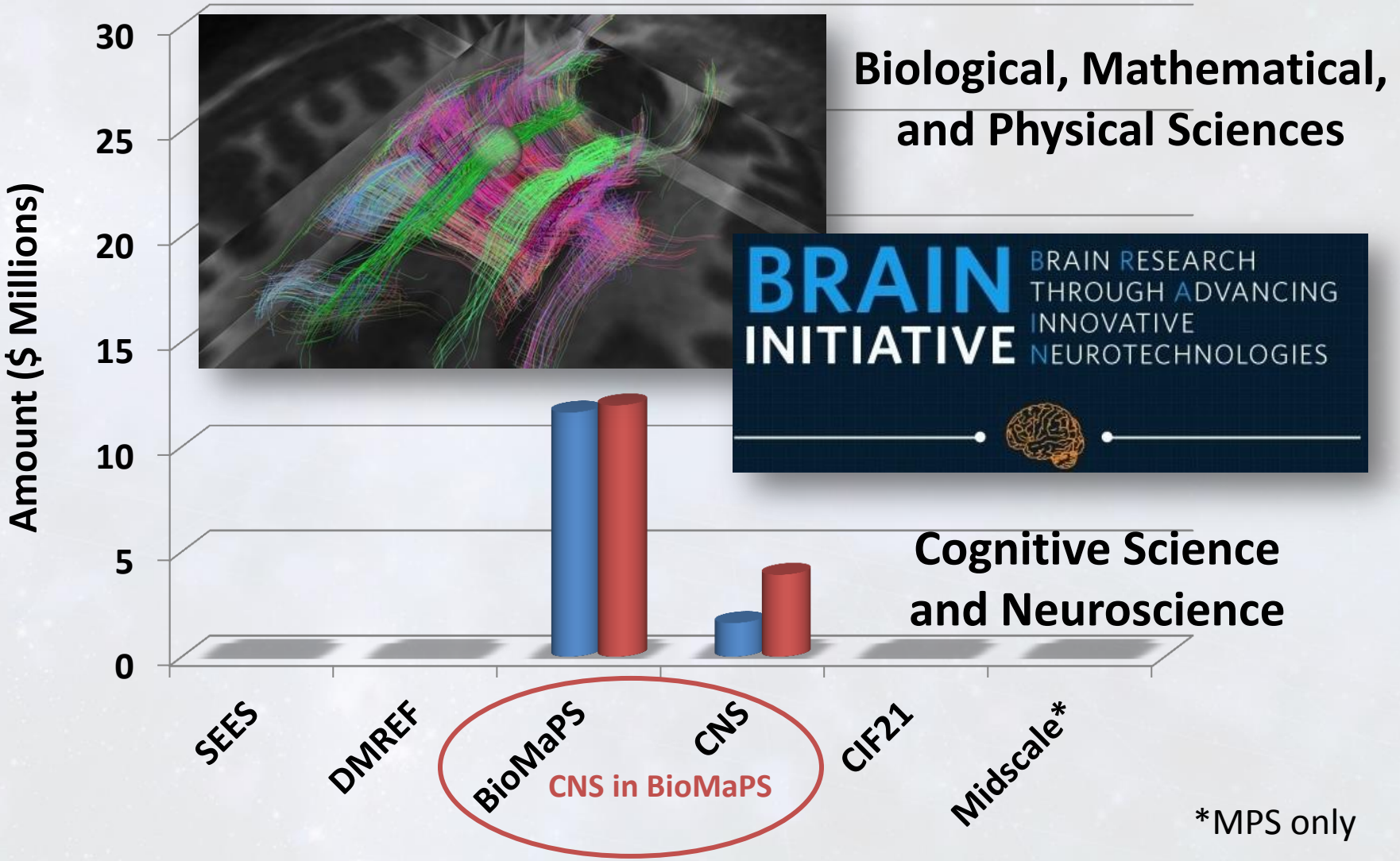

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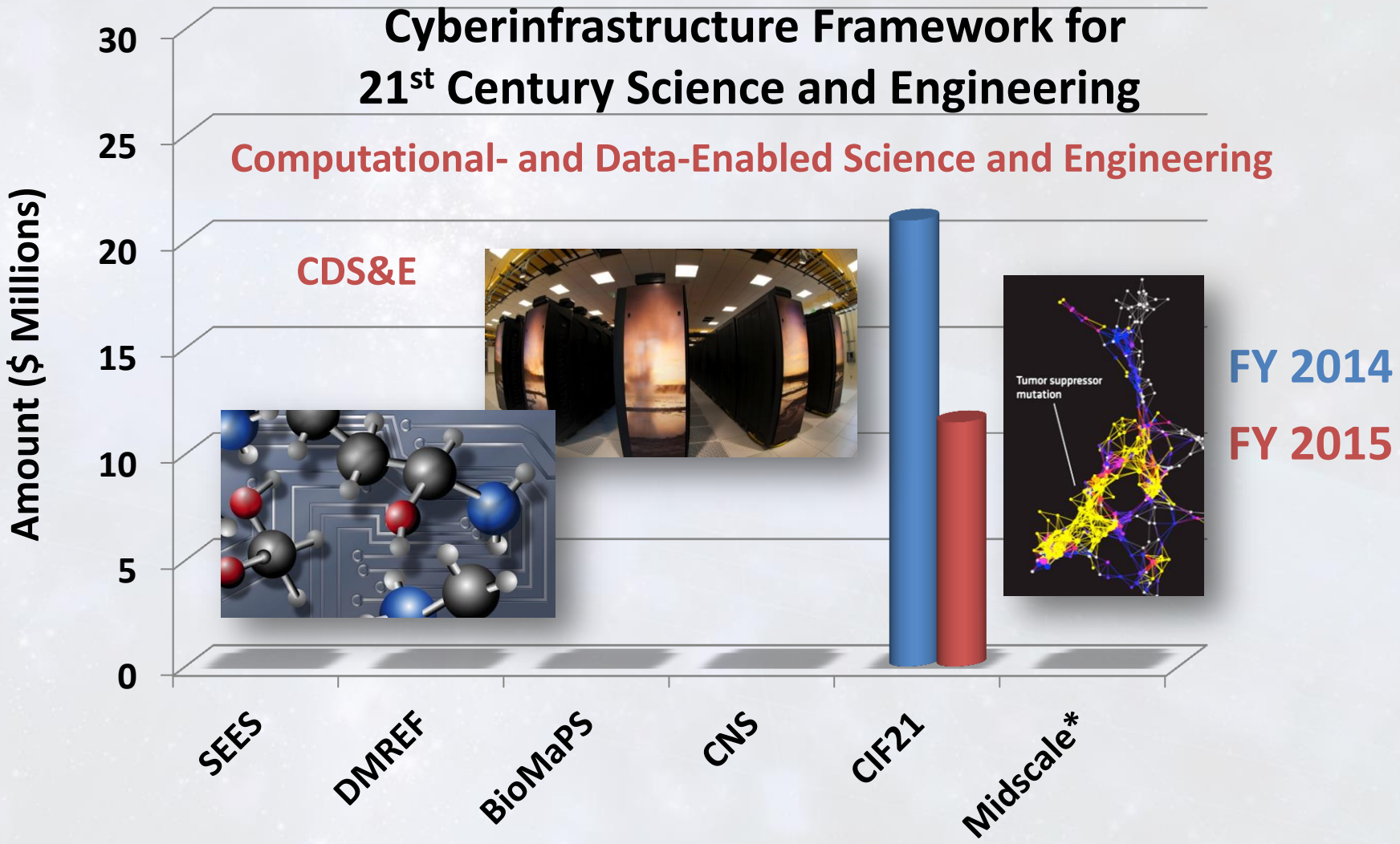
Selected MPS Major Investments



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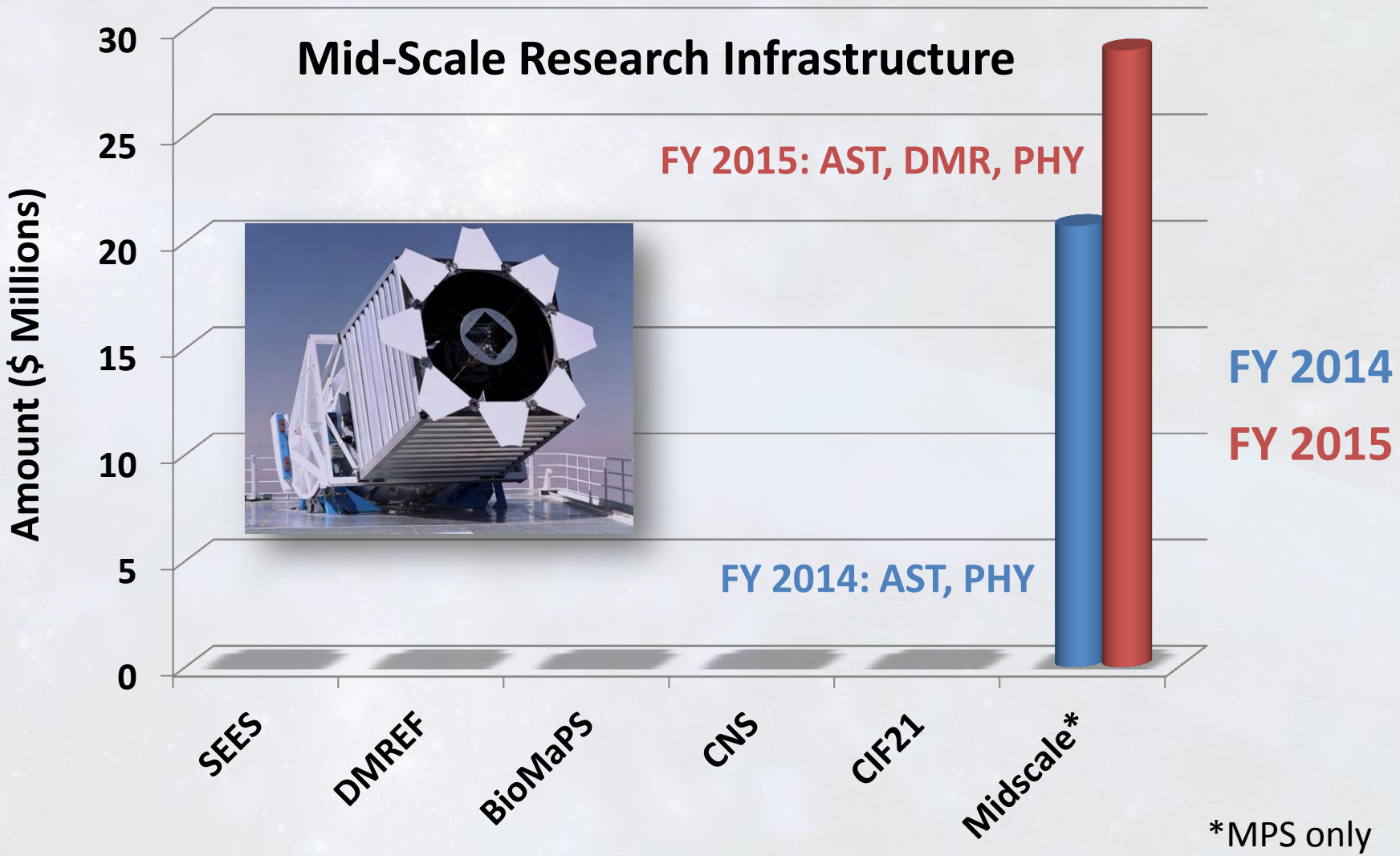
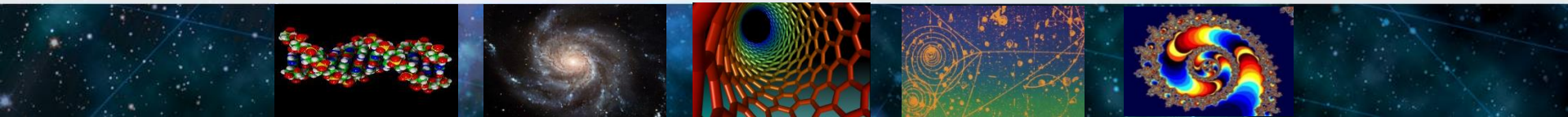


*MPS only



MPS Participation in NSF-Wide Initiatives

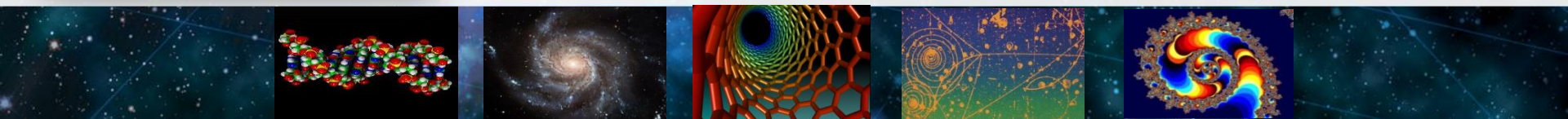
Cognitive Science and Neuroscience
Cyber-Enabled Materials, Manufacturing, and Smart Systems
Cyberinfrastructure Framework for the 21st Century
Science, Engineering, and Education for Sustainability
Secure and Trustworthy Cyberspace

CNS, CEMMSS, CIF21, SEES, SaTC

$75.6M

⬇

5.8% of MPS Budget

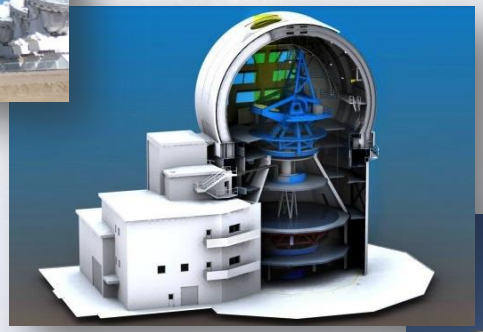


MPS-Supported Multi-user Facilities

ALMA

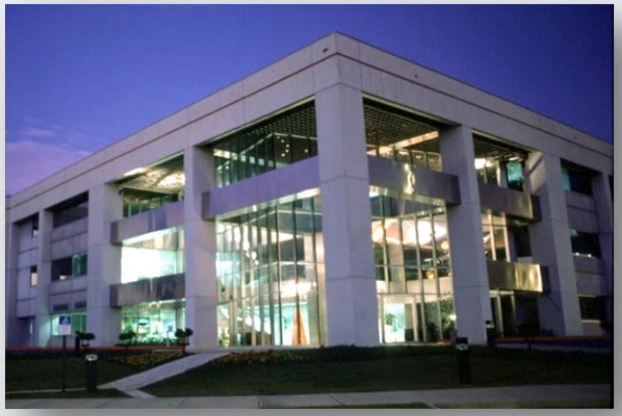
Gemini South

Blanco



DKIST (ATST)

IceCube

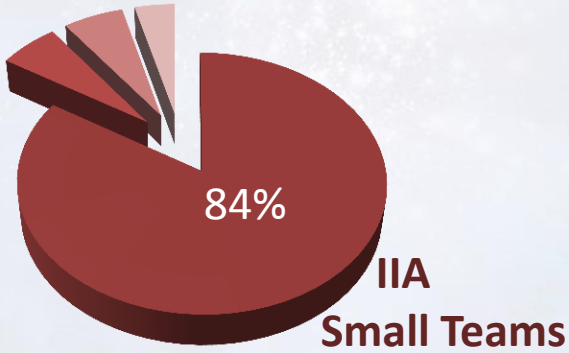


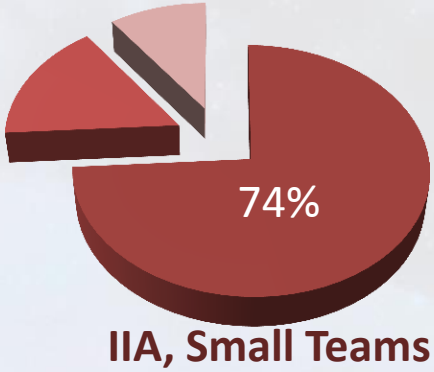
NHMFL

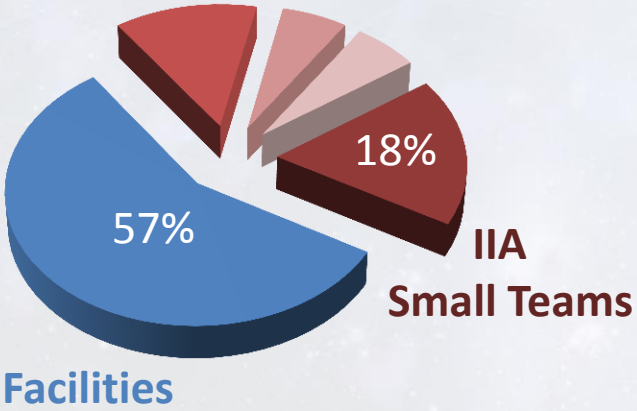
LIGO

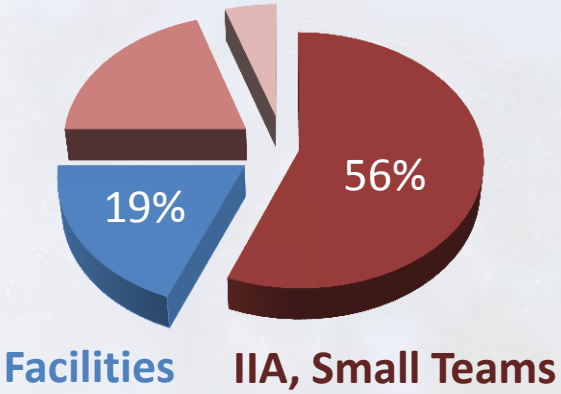
FY 2015 Request: $ 1296M

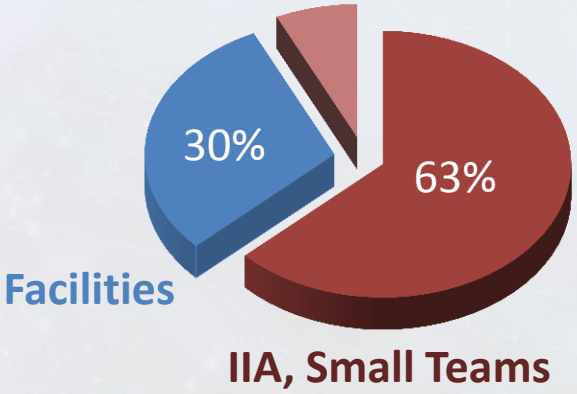
Astronomical Sciences (AST)	Chemistry (CHE)	Materials Research (DMR)	Mathematical Sciences (DMS)	Physics (PHY)
$ 236M	$ 237M	$ 299M	$ 224M	$ 264M

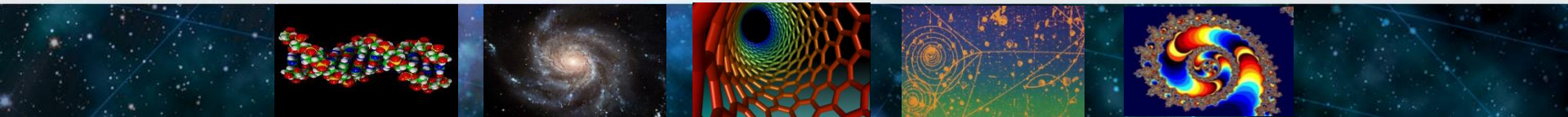




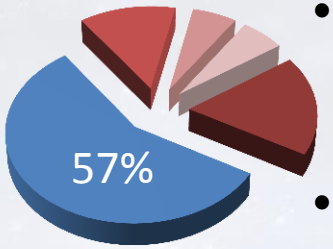




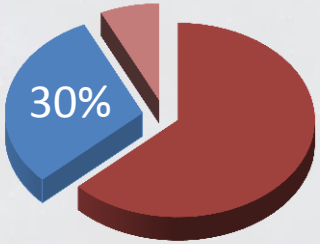




Astronomy (AST)



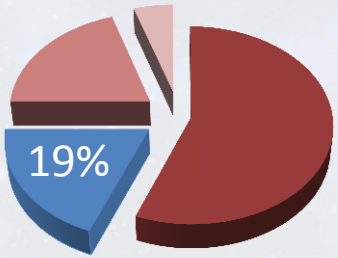
- Arecibo Observatory
- Atacama Large Millimeter Array (ALMA)
- Daniel K. Inouye Solar Telescope (DKIST (ATST))
- Gemini Observatory
- Large Synoptic Survey Telescope (LSST)
- National Optical Astronomy Observatory (NOAO)
- National Radio Astronomy Observatory (NRAO)
- National Solar Observatory (NSO)



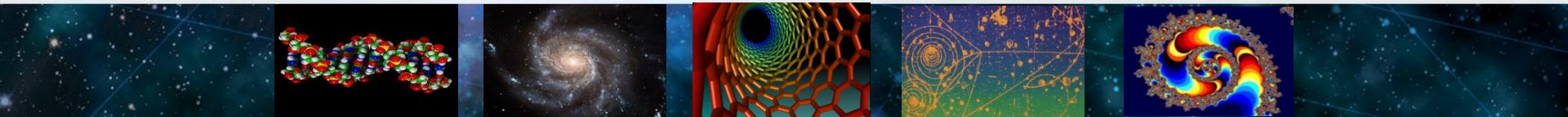
Physics (PHY)

- 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)



Two Different Budget Lines for Facilities

NSF FY 2015 Request ($ in millions)	FY 2015 Request
Research & Related Activities	**$ 5,807**
Education & Human Resources	890
Major Research Equipment & Facilities Construction	**201**
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National Science Board	4
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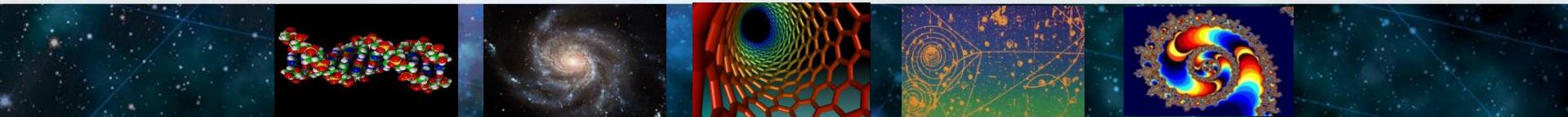
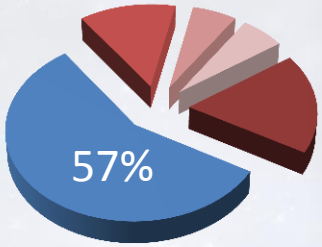
Total NSF	**$ 7,255**



Two Different Budget Lines for Facilities

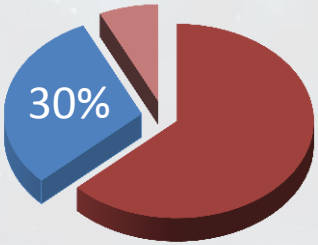
Operations (R&RA)



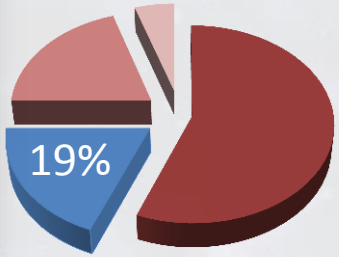
AST

ALMA

IceCube

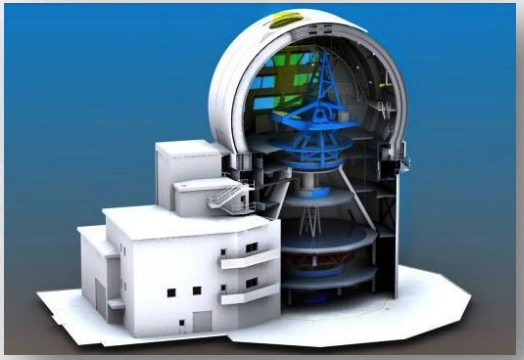


PHY



DMR

Major Research Equipment and Facilities Construction (MREFC)



DKIST

LSST

Building the STEM Pipeline Through MPS Research

CAREER
Young Teacher-Scholars

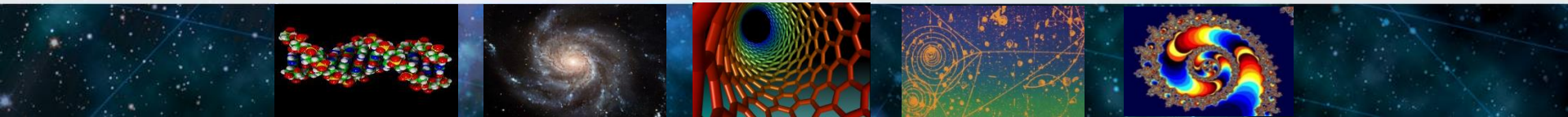
	FY 2014 Estimate	FY2015 Request
MPS	$ 65M	$ 66M
NSF	$ 210M	$ 213M

31% of CAREER funding from MPS

Research Experiences for Undergraduates (REU)
Undergraduate Research Programs

	FY 2014 Estimate	FY2015 Request
MPS	$ 22.4M	$ 21.2M
NSF	$ 75.3M	$ 75.1M

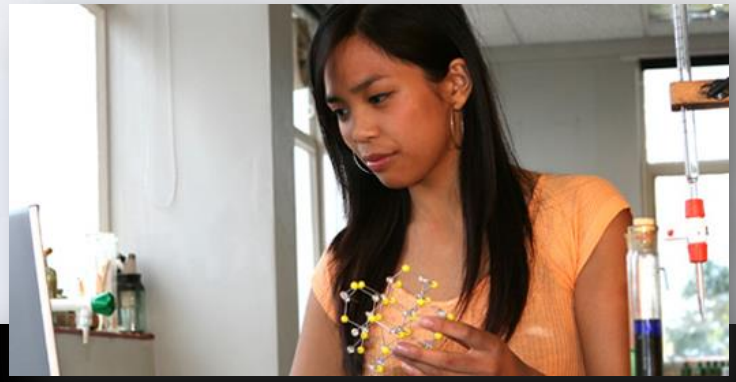
28% of REU funding from MPS



Building the STEM Pipeline Through MPS Research

Alliances for Graduate Education and the Professoriate (AGEP)

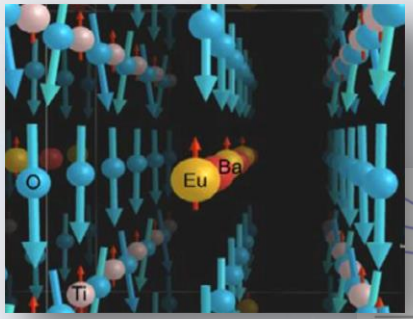
Supplements to support under-represented graduate students

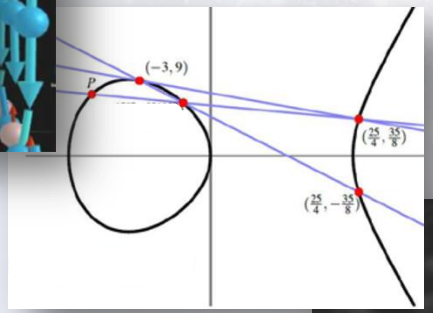


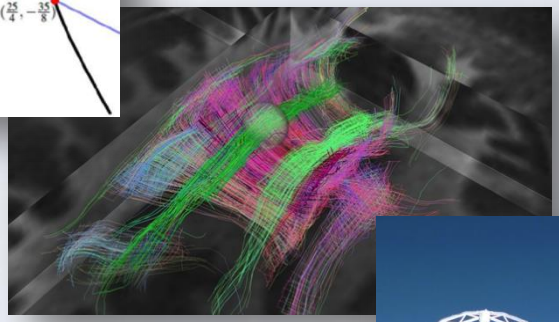
AGEP Alliances for Graduate Education and the Professoriate

FY 2012: 27 **FY 2013: 39** **FY 2014: >40**

Fundamental Research in the Mathematical and Physical Sciences





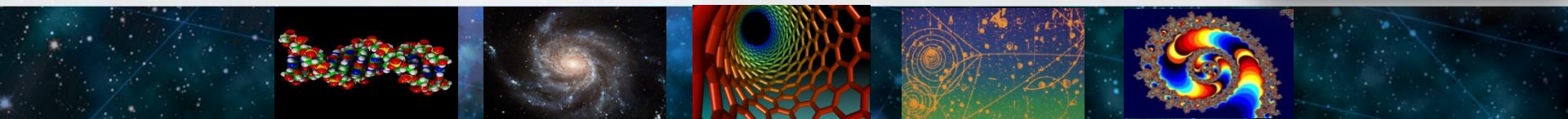


Advancing Discovery

Building Blocks for Innovation

Forefront Facilities

Inspiring the Next Generation



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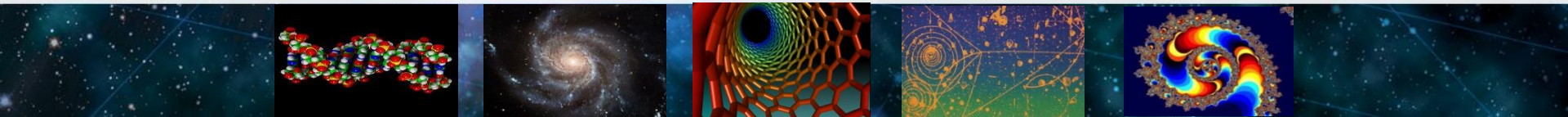
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http://people.csail.mit.edu/dina/
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http://www.aep.cornell.edu/people/profile.cfm?netid=cjf76
http://www.sciencemag.org/content/342/6161.cover-expansion
CERN/CMS Collaboration 2011 http://home.web.cern.ch/about/experiments/cms
Van Wedeen, MGH, Harvard http://www.martinos.org/user/5194
http://www.whitehouse.gov/share/brain-initiative
http://www.ayasdi.com/
Sloan Digital Sky Survey http://www.sdss3.org/
LeEllen Phelps, DKIST, NSO www.nso.edu
http://icecube.wisc.edu/news/view/88
http://www.magnet.fsu.edu/mediacenter/factsheets/imagelibrary/
LIGO http://www.ligo.caltech.edu/
LSST Project Office, 2012 http://www.lsst.org/lsst/about/team
http://www.nsfagep.org/
Nicola A Spalding, Materials Theory, ETH Zurich http://theory.mat.ethz.ch
Karl Rubin, University of California, Irvine http://www.math.uci.edu/~krubin/