National Aeronautics and Space Administration
President's FY 2010 Budget Request Summary

Budget Authority, $ in million By Appropriation Account By Theme	FY 2008 Actuals	FY 2009 Enacted	Recovery Act	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014
Science	**4,733.2**	**4,503.0**	**400.0**	**4,477.2**	**4,747.4**	**4,890.9**	**5,069.0**	**5,185.4**
Earth Science	1,237.4	1,379.6	325.0	1,405.0	1,500.0	1,550.0	1,600.0	1,650.0
Planetary Science	1,312.6	1,325.6		1,346.2	1,500.6	1,577.7	1,600.0	1,633.2
Astrophysics	1,395.6	1,206.2	75.0	1,120.9	1,074.1	1,042.7	1,126.3	1,139.6
Heliophysics	787.6	591.6		605.0	672.6	720.5	742.7	762.6
Aeronautics	**511.4**	**500.0**	**150.0**	**507.0**	**514.0**	**521.0**	**529.0**	**536.0**
Exploration	**3,299.4**	**3,505.5**	**400.0**	**3,963.1***	**6,076.6***	**6,028.5***	**5,966.5***	**6,195.3***
Constellation Systems	2675.9	3033.2	400.0	3505.4	5543.3	5472.0	5407.6	5602.6
Advanced Capabilities	623.5	472.3		457.7	533.3	556.5	558.9	592.7
Space Operations	**5,427.2**	**5,764.7**	**0.0**	**6,175.6**	**3,663.8**	**3,485.3**	**3,318.6**	**3,154.8**
Space Shuttle	3,295.4	2,981.7		3.157.1	382.8	87.8	0.0	0.0
International Space Station	1,685.5	2,060.2		2,267.0	2,548.2	2,651.6	2,568.9	2,405.9
Space and Flight Support	446.2	722.8		751.5	732.7	745.9	749.7	748.9
Education	**146.8**	**169.2**	**0.0**	**126.1**	**123.8**	**123.8**	**123.8**	**125.5**
Education	146.8	169.2		126.1	123.8	123.8	123.8	125.5
Cross-Agency Support	**3,251.4**	**3,306.4**	**50.0**	**3,400.6**	**3,468.4**	**3,525.7**	**3,561.4**	**3,621.4**
Center Management and Operations	2,011.7	2,024.0		2,084.0	2,119.2	2,142.5	2,166.1	2,189.9
Agency Management and Operations	834.1	921.2		961.2	956.9	964.5	972.3	981.5
Institutional Investments	325.5	293.7	50.0	355.4	392.3	418.7	423.0	450.0
Congressionally Directed Items	80.0	67.5		0.0	0.0	0.0	0.0	0.0
Inspector General	**32.6**	**33.6**	**2.0**	**36.4**	**37.0**	**37.8**	**38.7**	**39.6**
NASA FY 2010	**17,401.9**	**17,782.4**	**1,002.0**	**18,686.0**	**18,631.0**	**18,613.0**	**18,607.0**	**18,858.0**
Year to Year Change		2.2%		5.1%	-0.3%	-0.1%	0.0%	1.3%

**** Following the human spaceflight review, the Administration will provide an updated request for Exploration activities reflecting the review's results.***

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National Aeronautics and Space Administration
President's FY 2010 Budget Request Detail

Budget Authority, $ in million
By Appropriation Account
By Theme

	FY 2008 Actuals	FY 2009** Enacted	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014
Science	**4,733.2**	**4,903.0**	**4,477.2**	**4,747.4**	**4,890.9**	**5,069.0**	**5,185.4**
Earth Science	**1,237.4**	**1,704.6**	**1,405.0**	**1,500.0**	**1,550.0**	**1,600.0**	**1,650.0**
Earth Science Research	*358.3*	*437.4*	*397.5*	*407.5*	*404.2*	*416.8*	*412.1*
Earth Science Research and Analysis	259.4	313.7	281.7	300.3	294.2	304.4	296.5
Computing and Management	98.9	123.7	115.8	107.2	110.0	112.4	115.6
Earth Systematic Missions	*546.1*	*898.9*	*715.5*	*725.4*	*786.4*	*818.8*	*867.6*
Global Precipitation Measurement (GPM)	74.4	157.8	159.5	127.6	137.5	111.2	80.4
Glory Mission	82.3	50.7	27.1	10.1	4.4	1.9	0.0
Landsat Data Continuity Mission (LDCM)	127.3	200.9	120.6	137.4	165.0	90.0	15.0
NPOESS Preparatory Project (NPP)	46.1	57.1	112.8	33.8	5.3	5.2	5.1
Ice, Cloud and Land Elevation Satellite (ICESat-II)	9.6	38.8	39.2	74.6	99.1	126.9	161.7
Soil Moisture Active and Passive (SMAP)	9.6	104.3	70.0	132.2	180.4	135.0	40.0
Decadal Survey Missions	16.8	82.3	0.0	10.9	8.8	161.1	374.6
Other Missions and Data Analysis	180.1	206.9	186.3	198.9	186.0	187.5	190.8
Earth System Science Pathfinder	*106.8*	*118.3*	*63.9*	*128.8*	*114.2*	*121.4*	*119.1*
Aquarius	33.4	44.7	18.3	6.3	4.2	2.8	0.0
Venture Class Missions	0.0	21.0	12.9	79.2	66.5	75.1	75.7
Other Missions and Data Analysis	73.4	52.6	32.8	43.3	43.5	43.5	43.4
Earth Science Multi-Mission Operations	*143.0*	*148.1*	*149.9*	*160.3*	*165.4*	*161.3*	*165.5*
Earth Science Multi-Mission Operations	143.0	148.1	149.9	160.3	165.4	161.3	165.5
Earth Science Technology	*43.0*	*54.1*	*45.9*	*47.2*	*48.2*	*49.5*	*52.7*
Earth Science Technology	43.0	54.1	45.9	47.2	48.2	49.5	52.7
Applied Sciences	*40.2*	*47.8*	*32.2*	*30.7*	*31.5*	*32.2*	*33.1*
Pathways	40.2	47.8	32.2	30.7	31.5	32.2	33.1

Budget Authority, $ in million
By Appropriation Account
By Theme

	FY 2008 Actuals	FY 2009** Enacted	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014
Planetary Science	**1,312.6**	**1,325.6**	**1,346.2**	**1,500.6**	**1,577.7**	**1,600.0**	**1,633.2**
Planetary Science Research	*183.1*	*162.1*	*161.7*	*193.5*	*240.2*	*232.6*	*254.2*
Planetary Science Research and Analysis	133.6	135.0	135.1	144.4	153.2	156.9	160.7
Other Missions and Data Analysis	18.6	19.5	21.4	22.2	22.3	22.7	29.3
Education and Directorate Management	27.7	3.9	1.4	23.1	60.7	49.0	60.1
Near Earth Object Observations	3.3	3.7	3.8	3.8	3.9	4.0	4.1
Lunar Quest Program	*41.3*	*105.0*	*103.6*	*142.6*	*138.6*	*145.5*	*118.7*
Lunar Science	36.2	64.8	33.3	52.4	58.5	64.3	39.4
Lunar Atmosphere and Dust Environment Explorer	5.1	30.2	66.5	73.9	31.1	0.0	0.0
International Lunar Network	0.0	10.0	3.7	16.3	48.9	81.2	79.3
Discovery	*136.4*	*247.0*	*213.2*	*234.6*	*256.8*	*256.5*	*264.3*
Gravity Recovery and Interior Laboratory (GRAIL)	67.0	122.4	124.1	104.8	41.4	4.7	0.0
Other Missions and Data Analysis	69.3	124.6	89.1	129.9	215.4	251.8	264.3
New Frontiers	*115.1*	*263.9*	*264.1*	*239.9*	*294.2*	*239.8*	*249.6*
Juno	95.0	245.0	237.2	174.2	71.4	17.8	18.1
Other Missions and Data Analysis	20.2	19.0	26.9	65.7	222.8	222.0	231.5
Mars Exploration	*709.3*	*381.6*	*416.1*	*494.5*	*405.5*	*514.3*	*536.7*
2009 Mars Science Lab	545.0	223.3	204.0	194.6	67.3	65.0	30.0
MAVEN	1.0	6.7	53.4	168.7	182.6	138.4	30.6
Other Missions and Data Analysis	163.3	151.6	158.7	131.2	155.7	310.9	476.1
Outer Planets	*62.2*	*101.1*	*98.6*	*97.1*	*140.3*	*117.7*	*118.5*
Outer Planets	62.2	101.1	98.6	97.1	140.3	117.7	118.5
Technology	*65.2*	*64.9*	*89.0*	*98.4*	*102.1*	*93.5*	*91.4*
Technology	65.2	64.9	89.0	98.4	102.1	93.5	91.4

Budget Authority, $ in million
By Appropriation Account
By Theme

	FY 2008 Actuals	FY 2009** Enacted	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014
Astrophysics	**1,395.6**	**1,281.2**	**1,120.9**	**1,074.1**	**1,042.7**	**1,126.3**	**1,139.6**
Astrophysics Research	*102.2*	*135.0*	*151.9*	*160.0*	*165.0*	*177.2*	*188.0*
Astrophysics Research and Analysis	56.9	60.0	61.1	62.5	64.0	66.2	67.8
Balloon Project	24.0	24.6	26.7	28.8	32.4	33.2	35.8
Other Missions and Data Analysis	21.3	50.4	64.1	68.6	68.5	77.9	84.4
Cosmic Origins	*870.1*	*819.2*	*667.2*	*598.9*	*550.3*	*523.8*	*452.3*
Hubble Space Telescope (HST)	244.9	207.7	112.6	101.6	94.6	91.1	93.2
James Webb Space Telescope (JWST)	510.3	446.9	441.4	385.1	354.6	335.6	259.8
Stratospheric Observatory for Infrared Astronomy (SOFIA)	63.8	72.8	72.8	74.0	75.8	77.6	79.1
Other Missions And Data Analysis	51.2	91.7	40.4	38.3	25.3	19.4	20.2
Physics of the Cosmos	*148.9*	*128.3*	*147.7*	*188.5*	*213.9*	*291.4*	*330.3*
Missions and Data Analysis	148.9	128.3	147.7	188.5	213.9	291.4	330.3
Exoplanet Exploration	*156.7*	*68.1*	*46.2*	*57.3*	*86.9*	*123.5*	*167.3*
Missions and Data Analysis	156.7	68.1	46.2	57.3	86.9	123.5	167.3
Astrophysics Explorer	*117.7*	*130.7*	*107.9*	*69.5*	*26.6*	*10.4*	*1.7*
Wide - Field Infrared Survey Explorer (WISE)	72.7	65.2	13.0	5.2	1.6	0.2	0.0
Nuclear Spectroscopic Telescope Array (NuStar)	16.7	38.7	59.9	33.7	6.8	6.4	0.0
Other Missions and Data Analysis	28.3	26.8	35.0	30.6	18.2	3.8	1.7
Heliophysics	**787.6**	**591.6**	**605.0**	**672.6**	**720.5**	**742.7**	**762.6**
Heliophysics Research	*183.3*	*195.9*	*178.6*	*178.1*	*183.1*	*190.6*	*194.3*
Heliophysics Research and Analysis	33.0	31.0	35.4	38.4	39.1	40.1	41.1
Sounding Rocket Operations	51.0	77.4	66.5	67.5	68.9	71.4	73.1
Other Missions and Data Analysis	99.4	87.5	76.7	72.3	75.1	79.1	80.1
Living with a Star	*218.1*	*238.6*	*212.2*	*204.6*	*208.7*	*230.0*	*236.6*
Solar Dynamics Observatory (SDO)	108.1	20.8	34.1	20.2	18.6	16.3	15.6
Radiation Belt Storm Probes (RBSP)	67.8	154.4	137.1	127.9	105.1	22.0	17.3
Solar Probe Plus	13.9	18.0	4.0	16.6	36.7	57.8	81.3
Other Missions and Data Analysis	28.4	45.3	37.0	39.8	48.3	134.0	122.4

Budget Authority, $ in million
By Appropriation Account
By Theme

	FY 2008 Actuals	FY 2009** Enacted	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014
Solar Terrestrial Probes	*71.9*	*123.1*	*143.0*	*169.1*	*170.6*	*160.8*	*164.3*
Magnetospheric Multiscale (MMS)	43.1	94.6	118.6	149.3	148.8	137.5	143.8
Other Missions and Data Analysis	28.8	28.5	24.4	19.8	21.8	23.3	20.5
Heliophysics Explorer Program	*48.1*	*31.4*	*69.4*	*119.7*	*158.1*	*161.3*	*167.4*
GOLD	0.3	0.5	0.5	10.6	10.9	6.7	0.9
Other Missions and Data Analysis	47.9	30.9	68.9	109.1	147.2	154.6	166.5
New Millennium	*15.0*	*2.7*	*1.8*	*1.1*	*0.0*	*0.0*	*0.0*
New Millennium	15.0	2.7	1.8	1.1	0.0	0.0	0.0
Near Earth Networks	*40.9*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Near Earth Networks	40.9	0.0	0.0	0.0	0.0	0.0	0.0
Deep Space Mission Systems (DSMS)	*210.3*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Deep Space Network	210.3	0.0	0.0	0.0	0.0	0.0	0.0
Aeronautics	**511.4**	**650.0**	**507.0**	**514.0**	**521.0**	**529.0**	**536.0**

Aeronautics	**511.4**	**650.0**	**507.0**	**514.0**	**521.0**	**529.0**	**536.0**
Aviation Safety	*66.5*	*89.3*	*60.1*	*59.6*	*59.2*	*61.7*	*62.5*
Integrated Vehicle Health Management	21.5	22.2	19.8	18.2	18.3	18.9	18.9
Aging Aircraft and Durability	9.1	13.4	11.4	11.2	11.7	12.1	12.1
Integrated Resilient Aircraft Control	21.8	37.3	16.4	17.0	17.6	18.2	18.2
Integrated Intelligent Flight Deck Technologies	14.1	16.3	12.5	13.3	11.6	12.6	13.4
Airspace Systems	*100.1*	*121.5*	*81.4*	*82.9*	*83.9*	*87.2*	*88.3*
NextGen Concepts and Technology Development	83.3	105.3	53.3	54.5	55.3	57.8	58.7
NextGen Systems Analysis, Integration, and Evaluation	16.8	16.2	28.1	28.4	28.5	29.5	29.6
Fundamental Aeronautics	*269.6*	*307.6*	*228.4*	*230.0*	*233.6*	*239.0*	*245.9*
Subsonic - Rotary Wing	30.8	38.9	26.1	26.1	26.3	27.4	27.9
Subsonic - Fixed Wing	119.6	155.2	101.6	103.7	105.4	107.3	110.8
Supersonics	53.0	55.6	40.6	40.0	40.7	42.0	42.8
Hypersonics	66.2	57.9	60.0	60.2	61.1	62.3	64.4

Budget Authority, $ in million By Appropriation Account By Theme	FY 2008 Actuals	FY 2009** Enacted	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014
Aeronautics Test Program	*75.1*	*131.6*	*74.7*	*77.1*	*77.2*	*76.6*	*78.7*
Aero Ground Test Facilities	50.0	100.0	48.6	50.1	50.2	49.8	51.2
Flight Operations and Test Infrastructure	25.1	31.6	26.1	27.0	27.0	26.8	27.5
Integrated Systems Research	*0.0*	*0.0*	*62.4*	*64.4*	*67.1*	*64.4*	*60.5*
Environmentally Responsible Aviation Project	0.0	0.0	62.4	64.4	67.1	64.4	60.5
Exploration	**3,299.4**	**3,905.5**	**3,963.1***	**6,076.6***	**6,028.5***	**5,966.5***	**6,195.3***
Constellation Systems	**2,675.9**	**3,433.2**	**3,505.4**	**5,543.3**	**5,472.0**	**5,407.6**	**5,602.6**
Constellation Systems Program	*2,545.3*	*3,130.2*	*3,466.4*	*5,531.3*	*5,472.0*	*5,407.6*	*5,602.6*
Program Integration and Operations	610.4	645.5	642.5	1,423.9	1,405.4	1,501.5	1,813.9
Crew Exploration Vehicle	889.5	1,387.2	1,383.5	1,938.9	2,056.1	1,931.0	1,751.7
Crew Launch Vehicle	1,030.5	1,067.4	1,415.4	2,143.3	1,985.5	1,950.1	2,012.0
Cargo Launch Vehicle	15.0	30.0	25.0	25.0	25.0	25.0	25.0
Commercial Crew and Cargo	*130.5*	*303.0*	*39.1*	*12.2*	*0.0*	*0.0*	*0.0*
Advanced Capabilities	**623.5**	**472.3**	**457.7**	**533.3**	**556.5**	**558.9**	**592.7**
Human Research Program	*149.6*	*151.9*	*151.5*	*151.9*	*157.4*	*161.4*	*166.2*
Exploration Technology Development	*286.9*	*264.1*	*287.0*	*381.2*	*399.0*	*397.5*	*426.5*
Lunar Precursor Robotic Program	*187.1*	*56.3*	*19.1*	*0.2*	*0.1*	*0.0*	*0.0*

**** Following the human spaceflight review, the Administration will provide an updated request for Exploration activities reflecting the review's results. FY 2010 and outyear funding levels for Exploration activities shown here represent the budget request if there were no changes to ongoing activities.***

Budget Authority, $ in million
By Appropriation Account
By Theme

	FY 2008 Actuals	FY 2009** Enacted	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014
Space Operations	**5,427.2**	**5,764.7**	**6,175.6**	**3,663.8**	**3,485.3**	**3,318.6**	**3,154.8**
Space Shuttle	**3,295.4**	**2,981.7**	**3,157.1**	**382.8**	**87.8**	**0.0**	**0.0**
Space Shuttle Program	*3,295.4*	*2,981.7*	*3,157.1*	*382.8*	*87.8*	*0.0*	*0.0*
Program Integration	516.6	489.6	678.1	152.0	22.7	0.0	0.0
Flight and Ground Operations	1,124.9	1,031.2	1,035.1	109.5	49.1	0.0	0.0
Flight Hardware	1,653.9	1,460.9	1,443.9	121.3	16.0	0.0	0.0
International Space Station	**1,685.5**	**2,060.2**	**2,267.0**	**2,548.2**	**2,651.6**	**2,568.9**	**2,405.9**
International Space Station Program	*1,685.5*	*2,060.2*	*2,267.0*	*2,548.2*	*2,651.6*	*2,568.9*	*2,405.9*
ISS Operations	1,603.2	1,755.4	1,639.0	1,717.3	1,513.9	1,437.8	1,449.0
ISS Cargo Crew Services	82.3	304.8	628.0	830.9	1,137.7	1,131.1	956.9
Space and Flight Support	**446.2**	**722.8**	**751.5**	**732.7**	**745.9**	**749.7**	**748.9**
Space Communications and Navigation	*303.9*	*582.9*	*496.6*	*506.9*	*520.3*	*524.0*	*524.0*
Space Communications Networks	56.5	363.5	427.2	423.0	440.8	431.1	444.3
Space Communications Support	97.4	65.4	43.4	64.9	56.9	79.5	79.7
TDRS Replenishment	150.0	154.0	26.0	19.0	22.6	13.4	0.0
Human Space Flight Operations	*0.0*	*0.0*	*114.7*	*88.5*	*88.6*	*88.7*	*89.0*
Space Flight Crew Operations	0.0	0.0	114.7	88.5	88.6	88.7	89.0
Launch Services	*91.8*	*89.6*	*85.9*	*84.1*	*83.9*	*83.9*	*82.8*
Launch Services	91.8	89.6	85.9	84.1	83.9	83.9	82.8
Rocket Propulsion Test	*41.9*	*41.8*	*45.8*	*44.6*	*44.5*	*44.5*	*44.5*
Rocket Propulsion Testing	41.9	41.8	45.8	44.6	44.5	44.5	44.5
Crew Health & Safety	*8.7*	*8.6*	*8.6*	*8.5*	*8.5*	*8.5*	*8.5*
Crew Health and Safety	8.7	8.6	8.6	8.5	8.5	8.5	8.5

Budget Authority, $ in million

By Appropriation Account
By Theme

	FY 2008 Actuals	FY 2009** Enacted	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014
Education	**146.8**	**169.2**	**126.1**	**123.8**	**123.8**	**123.8**	**125.5**
Education	**146.8**	**169.2**	**126.1**	**123.8**	**123.8**	**123.8**	**125.5**
Higher Ed. STEM Education	*92.0*	*107.7*	*80.6*	*80.6*	*80.6*	*80.7*	*80.7*
STEM Opportunities (Higher Education)	9.0	9.5	11.6	11.6	11.6	11.6	11.6
NASA Space Grant	35.7	40.0	28.4	28.4	28.4	28.4	28.4
Experimental Program to Stimulate Competitive Research	12.8	20.0	10.0	10.0	10.0	10.0	10.0
Minority University Research & Education Program	27.5	28.2	30.7	30.7	30.7	30.7	30.7
Global Climate Change Education	7.0	10.0	0.0	0.0	0.0	0.0	0.0
K-12 STEM Education	*41.3*	*47.5*	*43.3*	*41.0*	*41.0*	*41.0*	*42.7*
STEM Student Opportunities (K-12)	9.6	10.5	14.5	14.5	14.5	14.5	14.5
STEM Teacher Development (K-12)	20.1	21.0	28.9	26.5	26.5	26.5	28.2
K-12 Competitive Educational Grant Program	11.6	16.0	0.0	0.0	0.0	0.0	0.0
Informal STEM Education	*13.5*	*14.0*	*2.1*	*2.1*	*2.1*	*2.1*	*2.1*
Science Museums and Planetarium Grants	7.8	7.0	0.0	0.0	0.0	0.0	0.0
NASA Visitor Centers	5.8	7.0	0.0	0.0	0.0	0.0	0.0
NASA Informal Education Opportunities	0.0	0.0	2.1	2.1	2.1	2.1	2.1
Cross-Agency Support	**3,251.4**	**3,356.4**	**3,400.6**	**3,468.4**	**3,525.7**	**3,561.4**	**3,621.4**
Center Management and Operations	**2,011.7**	**2,024.0**	**2,084.0**	**2,119.2**	**2,142.5**	**2,166.1**	**2,189.9**
Center Management and Operations	*2,011.7*	*2,024.0*	*2,084.0*	*2,119.2*	*2,142.5*	*2,166.1*	*2,189.9*
Center Institutional Capabilities	1,555.6	1,579.0	1,608.6	1,626.1	1,631.7	1,637.2	1,644.5
Center Programmatic Capabilities	456.1	445.0	475.4	493.1	510.8	528.9	545.4
Agency Management and Operations	**834.1**	**921.2**	**961.2**	**956.9**	**964.5**	**972.3**	**981.5**
Agency Management	*353.8*	*390.0*	*412.7*	*417.4*	*422.0*	*426.6*	*431.3*
Agency Management	353.8	390.0	412.7	417.4	422.0	426.6	431.3

Budget Authority, $ in million
By Appropriation Account
By Theme

	FY 2008 Actuals	FY 2009** Enacted	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014
Safety and Mission Success	*171.5*	*179.1*	*183.9*	*186.1*	*188.6*	*190.9*	*193.0*
Safety and Mission Assurance	43.9	42.9	48.3	48.8	49.3	49.7	50.4
Chief Engineer	94.8	87.0	102.2	103.6	105.3	106.8	107.0
Chief Health and Medical Officer	2.3	4.1	3.7	3.7	3.7	3.8	3.8
Independent Verification and Validation	30.5	45.0	29.7	30.0	30.3	30.6	31.9
Agency IT Services	*134.9*	*163.9*	*150.4*	*138.3*	*138.0*	*138.3*	*139.7*
IT Management	17.3	17.3	31.9	25.8	25.1	24.0	23.0
Applications	68.3	67.2	70.2	66.1	66.7	67.1	68.8
Infrastructure	49.3	79.4	48.3	46.4	46.2	47.2	47.9
Innovative Partnerships Program	*146.8*	*160.2*	*184.8*	*184.9*	*185.7*	*186.3*	*187.0*
Technology Infusion	6.7	9.1	13.5	13.1	13.5	13.7	14.0
Small Business Innovative Research	86.9	113.4	124.1	124.1	124.1	124.1	124.1
Small Business Technology Transfer Research	13.2	13.6	14.1	14.1	14.1	14.1	14.1
Innovation Incubator	0.0	0.0	2.5	2.5	2.5	2.5	2.5
Future Centennial Challenges	0.0	0.0	4.0	4.0	4.0	4.0	4.0
Partnership Development	39.9	24.1	23.8	20.2	19.9	19.7	21.3
Innovative Technology	0.0	0.0	2.8	6.8	7.5	8.1	7.0
Strategic Capabilities Assets Program	*27.2*	*28.0*	*29.4*	*30.2*	*30.2*	*30.2*	*30.5*
Simulators	10.9	11.5	11.7	12.1	12.1	12.1	11.9
Thermal Vacuum Chambers	7.7	7.2	8.3	8.4	8.4	8.4	8.7
Arc Jets	8.6	9.3	9.4	9.7	9.7	9.7	9.9
Institutional Investments	**325.5**	**343.7**	**355.4**	**392.3**	**418.7**	**423.0**	**450.0**
Institutional Construction of Facilities	*249.0*	*268.9*	*284.2*	*326.0*	*367.4*	*371.6*	*397.4*
Institutional Construction Of Facilities	249.0	268.9	284.2	326.0	367.4	371.6	397.4
Environmental Compliance and Restoration	*76.5*	*74.8*	*71.2*	*66.3*	*51.3*	*51.4*	*52.6*
Environmental Compliance and Restoration	76.5	74.8	71.2	66.3	51.3	51.4	52.6

Budget Authority, $ in million
By Appropriation Account
By Theme

	FY 2008 Actuals	FY 2009** Enacted	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014
Congressionally Directed Items	**80.0**	**67.5**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Congressionally Directed Items	*80.0*	*67.5*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Congressionally Directed Items	80.0	67.5	0.0	0.0	0.0	0.0	0.0
Inspector General	**32.6**	**35.6**	**36.4**	**37.0**	**37.8**	**38.7**	**39.6**
Inspector General	**32.6**	**35.6**	**36.4**	**37.0**	**37.8**	**38.7**	**39.6**
IG Program	*32.6*	*35.6*	*36.4*	*37.0*	*37.8*	*38.7*	*39.6*
Inspector General	32.6	35.6	36.4	37.0	37.8	38.7	39.6
NASA FY 2010	**17,401.9**	**18,784.4**	**18,686.0**	**18,631.0**	**18,613.0**	**18,607.0**	**18,858.0**

** FY 2009 enacted column contains Recovery Act funding of $400M for Science, $150M for Aeronautics, $400M for Exploration, $50M for Cross Agency Support and $2M for Inspector General.

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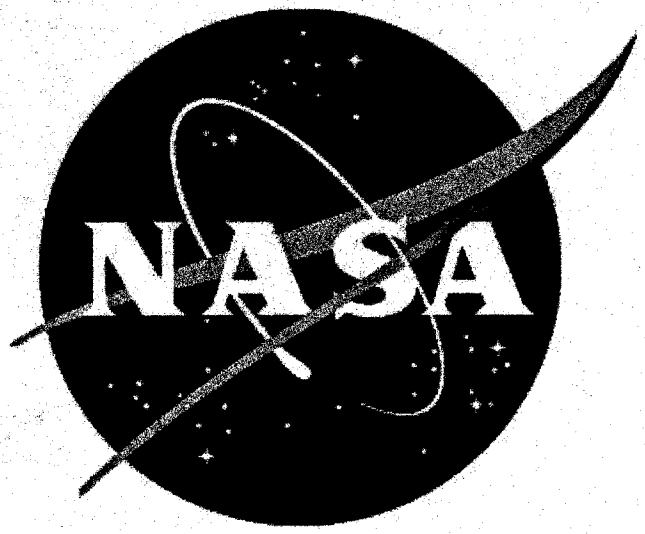
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION



FY 2010 Budget Request Summary

Message from the Administrator

Today, I am pleased to release NASA's FY2010 budget request in the amount of $18.686 billion to advance Earth science, complete the International Space Station, explore the solar system and conduct aeronautics research. The budget request represents an increase of $903.6 million, about 5 percent, above the amount provided NASA in the FY 2009 Omnibus Appropriations Act.

The FY 2010 budget does a number of things: it supports the Administration's commitment to deploy a global climate change research and monitoring system; it funds a strong program of space exploration involving humans and robots with the goal of returning Americans to the moon and exploring other destinations; and it supports the safe flight of the Space Shuttle to complete assembly of the International Space Station by the Space Shuttle's planned retirement.

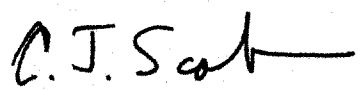
With the FY 2010 budget request, we will advance our global climate change research. NASA's investment in Earth science research satellites, airborne sensors, computer models and analysis already has revolutionized scientific knowledge and predictions of climate change and its effects. Using the National Research Council's recommended priorities for space-based Earth science research, we will develop new sensors to support the Administration's goal of deploying a global climate research and monitoring system.

The budget request also renews NASA's commitment to aeronautics research to address aviation safety, air traffic control, noise and emissions reduction, and fuel efficiency. And NASA's diverse portfolio of science, technology, engineering and mathematics educational activities is aligned with the administration's goal of improving American innovation and global competitiveness.

Along with the budget release, the White House also announced the launch of an independent review of NASA's human space flight activities. The Review of United States Human Space Flight Plans will examine our development programs and suggest possible alternatives. The goal is to provide options that will ensure the nation's human space flight program remains safe, innovative and affordable in the years following the space shuttle's retirement. During the review, work on the Constellation Program will continue.

The review team will work closely with NASA and seek input from the Congress, the White House, the public, industry and international partners as it develops these options. The review will be done by a blue-ribbon panel of experts. The panel's results will support an administration decision by August 2009 on how to proceed.

As we move forward into the future, I'm confident that with your expertise and hard work, NASA will continue its record of amazing accomplishments in exploration and research. The President's FY 2010 request represents a major investment in this future.



Christopher J. Scolese
Acting Administrator

FY 2010 Budget Overview

NASA's astronauts and robotic spacecraft have been exploring our solar system and the universe for more than 50 years. NASA's FY 2010 request funds a robust program to continue our missions of space exploration and aeronautics research. NASA's FY 2010 budget request, at $18.686 billion, represents an increase of $903.6 million above the amount provided for NASA in the FY 2009 Omnibus Appropriations Act (P.L. 110-8), a 5% increase.

NASA's FY 2010 budget request supports the Administration's commitment to deploy a global climate change research and monitoring system, funds a robust program of space exploration involving humans and robots with a goal to return Americans to the Moon and explore other destinations, and funds the safe flight of the Shuttle to complete assembly of the ISS through its retirement at the end of 2010. The FY 2010 budget request funds continued use of the ISS to enable the Agency to develop, test, and validate critical exploration technologies and processes and, in coordination with our international partners, to make the ISS available support other government entities, commercial industry and academic institutions to conduct unique research in the microgravity environment of space. It will also stimulate private sector development and demonstration of vehicles that may support NASA's cargo and crew requirements. And it renews NASA's commitment to aeronautics research to address aviation safety, air traffic control, noise and emissions reduction, and fuel efficiency. NASA's diverse portfolio of science, technology, engineering and mathematics (STEM) educational activities is also aligned with the Administration's goal of improving American innovation and global competitiveness.

The Agency will create a new chapter of our legacy as we embark on a renewed program of human exploration to the Moon and other destinations beyond low Earth orbit. In the summer of 2009, NASA will participate in a review of planned U.S. human space flight activities with the goal of ensuring that the nation is on a vigorous and sustainable path to achieving its boldest aspirations in space. The review will examine ongoing Exploration activities as well as alternatives to ensure the Nation is pursuing the best technical solution for future human spaceflight – one that is safe, innovative, and affordable. NASA also will send a broad suite of robotic missions to destinations throughout the solar system and develop a bold new set of astronomical observatories to probe the mysteries of the universe, increasing investment in research, data analysis, and technology development in support of these goals.

With the FY 2010 budget request, NASA advances global climate change research. The NASA investment in Earth science research satellites, airborne sensors, computer models and analysis has revolutionized scientific knowledge and predictions of climate change and its effects. Using the National Research Council's recommended priorities for space-based Earth science research as its guide, NASA will develop new space-based research sensors in support of the Administration's goal to deploy a global climate research and monitoring system. NASA will deploy these new sensors expeditiously while coordinating with other Federal agencies to ensure continuity of measurements that have long-term research and applications benefits.

With the FY 2010 request, NASA will complete the International Space Station (ISS) and advance the development of new space transportation systems and the unique scientific research that can be conducted onboard the ISS. NASA will fly the Space Shuttle to complete the ISS and then retire the Shuttle. NASA is committed to completing the nine remaining scheduled shuttle flights, which we believe can be accomplished by the end of 2010. . Funds freed from the Shuttle's retirement will enable the Agency to support development of systems to deliver people and cargo to the ISS and the Moon and explore other destinations. As part of

this effort, NASA will stimulate private-sector development and demonstration of vehicles to support the Agency's human crew and cargo space flight requirements. In addition, the Agency will continue to utilize the ISS, the permanently crewed facility orbiting Earth that enables the Agency to develop, test, and validate critical space exploration technologies and processes, and to conduct microgravity research. NASA also will continue to coordinate with international partners to make this platform available for other government entities, commercial industry, and academic institutions to conduct research.

The FY 2010 budget request renews NASA's commitment to a strong national program of aeronautics research and technology that contributes to the economic well-being and quality of life of American citizens. NASA will renew its commitment to cutting-edge, fundamental research in traditional and emerging disciplines to help transform the Nation's air transportation system and to support future aircraft. NASA research will increase airspace capacity and mobility, enhance aviation safety, and improve aircraft performance while reducing noise, emissions, and fuel consumption.

Finally, consistent with Administration priorities, NASA is developing plans to stimulate innovation and increase investments in technologies for the future while ensuring nearer-term Agency commitments are met.

Budget Authority ($M)	FY 2008	FY 2009	Recovery Act	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014
Science	4,733.2	4,503.0	400.0	4,477.2	4,747.4	4,890.9	5,069.0	5,185.4
Earth Science	1,237.4	1,379.6	325.0	1,405.0	1,500.0	1,550.0	1,600.0	1,650.0
Planetary Science	1,312.6	1,325.6		1,346.2	1,500.6	1,577.7	1,600.0	1,633.2
Astrophysics	1,395.6	1,206.2	75.0	1,120.9	1,074.1	1,042.7	1,126.3	1,139.6
Heliophysics	787.6	591.6		605.0	672.6	720.5	742.7	762.6
Aeronautics	511.4	500.0	150.0	507.0	514.0	521.0	529.0	536.0
Exploration	3,299.4	3,505.5	400.0	3963.1*	6076.6*	6028.5*	5966.5*	6195.3*
Constellation Systems	2,675.9	3,033.1	400.0	3,505.4	5,543.3	5,472.0	5,407.6	5,602.6
Advanced Capabilities	623.5	472.3		457.7	533.3	556.5	558.9	592.7
Space Operations	5,427.2	5,764.7	0.0	6,175.6	3,663.8	3,485.3	3,318.6	3,154.8
Space Shuttle	3,295.4	2,981.7		3,157.1	382.8	87.8	0.0	0.0
International Space Station	1,685.5	2,060.2		2,267.0	2,548.2	2,651.6	2,568.9	2,405.9
Space and Flight Support (SFS)	446.2	722.8		751.5	732.7	745.9	749.7	748.9
Education	146.8	169.2	0.0	126.1	123.8	123.8	123.8	125.5
Cross-Agency Support	3,251.4	3,306.4	50.0	3,400.6	3,468.4	3,525.7	3,561.4	3,621.4
Center Management and Operations	2,011.7	2,024.0		2,084.0	2,119.2	2,142.5	2,166.1	2,189.9
Agency Management and Operations	834.1	921.2		961.2	956.9	964.5	972.3	981.5
Institutional Investments	325.5	293.7	50.0	355.4	392.3	418.7	423.0	450.0
Congressionally Directed Items	80.0	67.5		0.0	0.0	0.0	0.0	0.0
Inspector General	32.6	33.6	2.0	36.4	37.0	37.8	38.7	39.6
NASA FY 2010	17,401.9	17,782.4	1,002.0	18,686.0	18,631.0	18,613.0	18,607.0	18,858.0
Year to Year Change		*2.2%*		*5.1%*	*-0.3%*	*-0.1%*	*0.0%*	*1.3%*

*Following the human spaceflight review, the Administration will provide an updated request for Exploration activities reflecting the review's results.

Science

NASA's Science Mission Directorate continues to expand humanity's understanding of our Earth, our Sun, the solar system and the universe with 57 science missions in operation and 32 more in formulation or development. The Science budget funds these missions as well as the research of over 3,000 scientists and their students across the nation. NASA's request and plans for FY 2010 – FY 2013 increases funding for Science by $762 million over the FY 2009 request.

Budget Authority ($ millions)	FY 2008 Actual	FY 2009 Enacted	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014
FY 2010 President's Budget Request	**4,733.2**	**4,903.0**	**4,477.2**	**4,747.4**	**4,890.9**	**5,069.0**	**5,185.4**
Earth Science	1,237.4	1,704.6	1,405.0	1,500.0	1,550.0	1,600.0	1,650.0
Planetary Science	1,312.6	1,325.6	1,346.2	1,500.6	1,577.7	1,600.0	1,633.2
Astrophysics	1,395.6	1,281.2	1,120.9	1,074.1	1,042.7	1,126.3	1,139.6
Heliophysics	787.6	591.6	605.0	672.6	720.5	742.7	762.6
FY 2009 President's Budget Request	**4,706.2**	**4,441.5**	**4,482.0**	**4,534.9**	**4,643.4**	**4,761.6**	**-**
Earth Science	1,280.3	1,367.5	1,350.7	1,250.9	1,264.4	1,290.3	-
Planetary Science	1,247.5	1,334.2	1,410.1	1,537.5	1,570.0	1,608.7	-
Astrophysics	1,337.5	1,162.5	1,122.4	1,057.1	1,067.7	1,116.0	-
Heliophysics	840.9	577.3	598.9	689.4	741.2	746.6	-
Total Change from FY2009 President's Budget Request	**27.0**	**461.5**	**-4.8**	**212.5**	**247.5**	**307.4**	

Reflecting the Administration's commitment to global climate change research, NASA has increased the Earth Science budget for FY 2010 – FY 2013 by $0.9 billion. Including the additional resources provided in the FY 2009 appropriation and the Recovery Act, NASA's Earth Science programs will have been increased by almost $1.2 billion over 5 years, a 19 per cent increase. NASA's 15 Earth Science missions in operation provide a large part of the global observations used for climate change research in the United States and elsewhere. This year, NASA's Earth Science satellites enabled research to understand how changes both in the tropics and in the Arctic sea ice are changing ocean biology globally. NASA also recently conducted the first Ice Bridge aircraft campaign to demonstrate a new airborne laser capability to bridge the gap in time between ICESats I and II. In FY 2010, NASA plans to launch the Glory mission to map atmospheric aerosols and continue the long record of solar influences on climate, and the Aquarius mission to provide the first global measurements of sea surface salinity. NASA will complete development of the NPOESS Preparatory Project and continue development of the Global Precipitation Mission and the Landsat Data Continuity Mission (LDCM), and initiate work on development of a Thermal Infra-Red Sensor (TIRS). The launch vehicle failure of the Orbiting Carbon Observatory (OCO) was a significant loss to the climate science communities, and NASA is assessing options to recover from that loss. NASA is continuing to work aggressively to implement the recommendations of the National Research Council Decadal Survey for Earth Science. The first two new missions the Decadal Survey recommended, SMAP and ICESat-II, will continue formulation in FY2010, with launches expected in late 2013/early 2014 and late 2014/early 2015 respectively. The next two, DESDynI and CLARREO, will be accelerated and transition to formulation. NASA also expects to issue its first Venture-class

Announcement of Opportunity later this year, implementing another decadal survey recommendation.

NASA's Planetary Science missions continue to return images and data from the far reaches of the Solar System. This year, the Mars Phoenix Lander completed its mission, conducting the first chemical test providing evidence of water ice on another planet. MESSENGER returned stunning imagery of portions of the planet Mercury never before seen. The Cassini spacecraft continues to provide un-paralleled science of the Saturnian system; the spacecraft flew within 25km of Enceladus viewing the ejecting plumes and surface, and data from 19 fly-bys of Titan enabled creation of a radar map showing 3-D topography revealing 1,200-meter (4,000-foot) mountain tops, polar lakes, vast dunes, and thick flows from possible ice volcanoes. Development is continuing on the Juno mission to Jupiter for launch in 2011. NASA and ESA jointly announced they will work together on a Europa Jupiter System mission concept as the next outer planets flagship effort. The MER rovers continue to study the Martian surface and have exceeded their fifth year of successful operations. NASA is continuing development of the Mars Science Laboratory (MSL) for launch in 2011 and selected MAVEN, a Mars aeronomy mission, as the next Mars Scout mission for launch in 2013. NASA has integrated its lunar science research program with the Lunar Precursor Robotic Program into a single Lunar Quest Program under the Science Mission Directorate, which includes lunar science missions and a new virtual university research collaboration called the NASA Lunar Science Institute. The Moon Mineralogy Mapper (M3) was launched aboard Chandrayaan-1 and has begun making scientific observations of the Moon's composition. Development is continuing on the GRAIL mission to map the Moon's gravity field for launch in 2011. This year, NASA is releasing Announcements of Opportunity for both the next New Frontiers and Discovery missions. NASA's request for Planetary Science is $1.3 billion for FY 2010.

2009 is the International Year of Astronomy, and NASA's Astrophysics program will deploy exciting new capabilities for studying the cosmic frontier. The Kepler mission, launched in March, is NASA's first mission dedicated to the search for Earth-like planets in our galaxy. ESA will launch the Herschel and Planck missions in May, carrying several NASA instruments, to study the far-infrared sky and the cosmic microwave background. The final Hubble Space Telescope serving mission aboard STS-125, scheduled for launch May 12, will upgrade the observatory to its peak scientific performance. In November, NASA plans to launch the Wide-field Infrared Survey Explorer (WISE) as part of its highly successful Explorer Program, following on the recent successes of the Fermi Gamma-ray Space Telescope (launched as GLAST in July 2008), which has provided the best-ever view of the gamma-ray sky revealing energetic sources in our solar system, our galaxy, and galaxies billions of light-years away. Development is continuing on the James Webb Space Telescope, which passed its Confirmation Review in 2008 and has an Agency commitment to launch in 2014. Development continues on the NuSTAR mission to study black holes for launch in 2011, along with a Soft X-ray Spectrometer to fly on Japan's Astro-H mission in 2013. Development continues on the airborne Stratospheric Observatory for Infrared Astronomy or SOFIA, which will conduct open door flight tests in 2009 and early science flights in 2010, with planned full operational capability in 2014. Formulation is continuing for ambitious future mission concepts to investigate the origins of planets, stars, and galaxies; to search for Earth-like planets around nearby stars; and to examine the nature of dark energy, dark matter, gravity waves, and black holes. These and other mission concepts are currently under consideration by the NRC's decadal survey for Astrophysics, or Astro2010, which will be completed during 2010, and will provide recommendations to NASA on the science community's highest priority science questions and strategic missions for the next decade. NASA's request for Astrophysics is $1.1 billion for FY 2010.

The fleet of NASA Heliophysics missions strategically placed throughout the solar system is providing researchers the first ever solar system-wide view of solar influences on the Earth and other planets, and the dynamic structures of space itself. This virtual "Great Observatory" is in place and functioning for the next solar magnetic activity cycle, and has already detected the first signs of a new solar maximum anticipated for 2011-2012. By early next year, the launch of Solar Dynamics Observatory will add to this fleet the capability to observe the solar atmosphere to a depth of one-third of the Sun's radius to study the flow of plasmas that generate magnetic fields and the sudden changes that produce coronal mass ejections that we experience as space weather. Also this year, NASA plans to select two Small Explorer (SMEX) missions in response to an Announcement of Opportunity issued in 2008, which could be either Heliophysics or Astrophysics missions depending on the proposals selected. Development of the Radiation Belt Storm Probes mission to study the interactions of space weather events with Earth's magnetic field is continuing for launch in 2012, as well as the Magnetosphere Multi-Scale mission to observe the processes of magnetic reconnection, energetic particle acceleration, and turbulence in Earth's magnetosphere for launch in 2014. Finally, NASA is continuing early formulation work on the Solar Probe-Plus mission that will travel into, and sample, the near-Sun environment to probe the origins of the solar wind. NASA's request for Heliophysics is $0.6 billion in FY 2010.

Aeronautics

Over the past year, NASA's Aeronautics Research Mission Directorate has continued to pursue long-term, innovative, and cutting-edge research that develops revolutionary tools, concepts, and technologies to enable a safer, more flexible, environmentally friendly, and more efficient national air transportation system. NASA Aeronautics Research also plays a vital role in supporting NASA's human and robotic re-entry vehicle research. NASA's request for Aeronautics is $507 million in FY 2010, with an increase of $247 million for FY 2010 – FY 2013. Including the additional resources provide in the FY 2009 appropriation and the Recovery Act, NASA's Aeronautics programs will have been increased by $450 million over 5 years, a 20% increase.

Budget Authority ($ millions)	FY 2008 Actual	FY 2009 Enacted	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014
FY 2010 President's Budget Request	**511.4**	**650.0**	**507.0**	**514.0**	**521.0**	**529.0**	**536.0**
Aeronautics	511.4	650.0	507.0	514.0	521.0	529.0	536.0
FY 2009 President's Budget Request	**511.7**	**446.5**	**447.5**	**452.4**	**456.7**	**467.7**	**-**
Aeronautics		446.5	447.5	452.4	456.7	467.7	-
Total Change from FY2009 President's Budget Request	**-0.3**	**203.5**	**59.5**	**61.6**	**64.3**	**61.3**	

A primary goal across Aeronautics Research programs is to establish strong partnerships with industry, academia, and other government agencies in order to enable significant advancement in our Nation's aeronautical expertise. NASA has put many mechanisms in place to engage academia and industry, including industry working groups and technical interchange meetings at the program and project level, Space Act Agreements (SAAs) for cooperative partnerships, and the NASA Research Announcement (NRA) process that provides for full and open competition for the best and most promising research ideas. To date, 68 SAAs have been established with industry partners across all programs and 375 NRAs have been awarded to academia, industry and non-profit organizations. NASA Aeronautics has continued to collaborate with the Joint Planning Development Office (JPDO), Federal Aviation Administration (FAA), U.S. Air Force, Army, and other government organizations.

NASA's Airspace Systems Program has partnered with the JPDO to help develop concepts, capabilities and technologies that will lead to significant enhancements in the capacity, efficiency and flexibility of the National Airspace System. A notable accomplishment is the successful completion, by NASA researchers in collaboration with academia and the FAA, of a series of human-in-the-loop experiments that explored advanced concepts and technology for separation assurance, which ensures that aircraft maintain a safe distance from other aircraft, terrain, obstacles, and certain airspace not designated for routine air travel. The technology being developed by NASA and its partners is critical to relieving air-traffic controller workload, a primary constraint on airspace capacity that is expected to increase in coming years. In the future, this Program will continue to develop new technologies to solve important problems such as surface traffic planning and control, and initial algorithms for airport arrival and departure balancing as well as developing traffic flow management concepts for increased efficiencies at the regional and national levels for different planning intervals.

NASA's Fundamental Aeronautics Program conducts research in all aeronautics disciplines that enable the design of vehicles that fly through any atmosphere at any speed. The program has supported the testing of various new concepts that will help enable much improved capabilities

for future vehicles. For example, wind-tunnel testing was conducted for several promising powered lift concepts. Powered lift concepts increase lifting force on an aircraft at slow speeds (e.g., at take-off and landing) without increasing drag under cruise conditions. Successful use of the concepts will enable short take-off and landings on runways less than 3000 feet, which will increase next-generation air transportation system capacity through the use of shorter fields and improved low-speed maneuverability in airport terminal areas. Testing was also completed for a Smart Material Actuated Rotor Technology (SMART) helicopter rotor, which offers the potential for significant noise and vibration reduction in rotorcraft. Future work includes technologies and advanced tools to evaluate the trades between noise, emissions, and performance of future aircraft entering service in the 2012-2015 timeframe.

NASA's Aviation Safety Program continues to develop tools and technologies to improve on today's incredibly safe air transportation system, while ensuring that future technologies can be safely incorporated to the system. Examples of advances that support this development include NASA's ongoing and new research into aircraft icing. For example, with current knowledge we cannot extrapolate how ice forms on a straight wing such as found on a turbo-prop to how it will form on a swept wing, or a radically new aircraft configuration. The Aviation Safety Program is tackling this with a combination of computational models and experiments in NASA's Icing Research Tunnel. We are establishing that, in high and cold flight conditions, ice can form deeper in jet engines than previously understood. NASA is working collaboratively with the FAA, industry and international partners, such as the National Research Council of Canada, to conduct tunnel tests of the underlying physics, to fly our instrumented S-3 Viking into such engine icing conditions, and design upgrades to our Propulsion System Lab in which jet engines may be tested in detail. Additional future work in Aviation Safety includes addressing gaps in validation and verification of critical flight software, developing new data-analysis capabilities to mine aviation operational data for safety issues, examining the safety of new vehicle systems and structures, and tackling the biggest human factors issues in the NextGen flightdeck.

NASA's Aeronautics Test Program (ATP) is focused on ensuring a healthy suite of facilities and platforms to meet the nation's testing needs including the development of new test instrumentation and test technologies. As part of its continuous efforts to improve facility operational efficiencies, ATP initiated the National Force Measurement Technology Capability, to address the severe erosion of NASA's capability to utilize strain gage balances in wind tunnel testing. The National Partnership for Aeronautics Testing, a strategic partnership between NASA and the Department of Defense (DOD), recently commissioned a study of government-owned, mid-to-large supersonic facilities necessary to fulfill future air vehicle test requirements. The Program will continue to develop a long-term strategic approach that aligns the NASA and DOD facilities to meet future requirements with the right mix of facilities and appropriate investments in facility capabilities.

NASA's Integrated Systems Research Program (ISRP), a new program effort beginning in FY10, has been organized to support the Environmentally Responsible Aviation (ERA) Project, a "green aircraft initiative," that will conduct system research and experiments of promising vehicle concepts and technologies that will simultaneously reduce fuel burn, noise and emissions. The environmental impacts of noise and emissions are a growing concern and could limit the ability of NextGen to meet the projected growth in demand for air transportation. The integrated system-level research in this program will be coordinated with on-going long-term, foundational research within the three other research programs, and will focus specifically on maturing and integrating technologies in major vehicle systems and subsystems for accelerated transition to practical application.

Exploration

Human space flight is important to America's political, economic, technological and scientific leadership. In the span of a few short years, NASA has taken long strides to formulate strategies and programs key to developing a robust program of space exploration. These critical steps will allow our Nation to build the next-generation spaceflight vehicles that will deliver humans and cargo to the ISS and the Moon, then on to other destinations in our solar system. NASA's FY 2010 budget advances the development of these systems with a $4.0 billion request for Exploration in FY 2010, which is an increase of five percent from the previous plan for FY 2010.

Budget Authority ($ millions)	FY 2008 Actual	FY 2009 Enacted	FY 2010*	FY 2011*	FY 2012*	FY 2013*	FY 2014*
FY 2010 President's Budget Request	**3,299.4**	**3,905.5**	**3,963.1**	**6,076.6**	**6,028.5**	**5,966.5**	**6,195.3**
Constellation Systems	2,675.9	3,433.2	3,505.4	5,543.3	5,472.0	5,407.6	5,602.6
Advanced Capabilities	623.5	472.3	457.7	533.3	556.5	558.9	592.7
FY 2009 President's Budget Request	**3,143.1**	**3,500.5**	**3,737.7**	**7,048.2**	**7,116.8**	**7,666.8**	-
Constellation Systems	2,471.9	3,048.2	3,252.8	6,479.5	6,521.4	7,080.5	-
Advanced Capabilities	671.1	452.3	484.9	568.7	595.5	586.3	-
Total Change from FY2009 President's Budget Request	**156.3**	**405.0**	**225.4**	**-971.6**	**-1,088.3**	**-1,700.3**	

***Following the human spaceflight review, the Administration will provide an updated request for Exploration activities reflecting the review's results.**

In the summer of 2009 NASA will review ongoing Exploration activities as well as alternatives to ensure the Nation is pursuing the best technical solution for future human spaceflight – one that is safe, innovative, and affordable. The review will develop suitable options for U.S. human space flight activities beyond retirement of the Space Shuttle in 2010, leading to a plan that will be presented to Congress regarding the core transportation elements and related aspects of a U.S.-led human space flight architecture that would support both crew transportation and rescue missions to the International Space Station and missions to the Moon and other destinations beyond low Earth orbit.

The review will be led by an independent, blue-ribbon team of experts, drawing extensively on resources and personnel from NASA. The review will consider architectures that are capable of supporting the two broad mission areas described above and incorporate both government and/or commercial elements. It will examine the appropriate amount of R&D and complementary robotic activities necessary to make human space flight activities affordable and productive over the long term, as well as appropriate opportunities for international participation. It will also evaluate what capabilities would be enabled by the potential architectures under consideration and will assess the implications of operating the International Space Station past 2016. The detailed FY 2010 and outyear funding levels for individual exploration activities presented in this document are placeholders. Following conclusion of the review, the Administration will provide an updated request for exploration that reflects the outcome of the review.

The Constellation Program is working to complete the formulation phase of its projects – in particular Ares I, Orion, and major ground facilities. Development work is underway, contracts are in place, and civil servants and contractors are working hard to accomplish Constellation

Program objectives. The Ares I-X test flight, planned for 2009, will lay the groundwork for maturing the Ares I final design prior to its Critical Design Review (CDR). When launched later this year from NASA's Kennedy Space Center in Florida, the Ares I-X will climb about 25 miles in a two-minute powered test of first stage performance, as well as the separation and parachute recovery system. Work on the Orion project also continues to advance. Later this year, Orion's PA-1 test will take place at White Sands Missile Range, New Mexico. PA-1 will demonstrate the Launch Abort System's ability to carry crew to safety should there be an emergency while the Orion and Ares I stack is on the launch pad.

As part of the Commercial Crew and Cargo Program and its associated Commercial Orbital Transportation Services (COTS) projects, NASA is investing in two funded COTS partners, Space Exploration Technologies Corporation (SpaceX) of El Segundo, California, and Orbital Sciences Corporation of Dulles, Virginia. Recently, SpaceX successfully operated the full complement of the first stage engines of the Falcon 9, the SpaceX launch vehicle. Orbital continues to progress in achieving engineering milestones, and will enter PDR in May. In addition, NASA has two non-funded COTS partners. In FY 2009, an additional $150 million in Recovery Act funds has been committed to begin the development of commercial crew launch capabilities.

The transition of NASA facilities, infrastructure, property, processes and personnel from the Space Shuttle Program to the Constellation Program continues to be a major activity. This joint effort between the Space Operations and Exploration Systems Mission Directorates is focused on leveraging existing Shuttle and Space Station assets for NASA's future Exploration activities.

NASA's Advanced Capabilities activity in the Human Research Program (HRP) and the Exploration Technology Development Program (ETDP) continues to reduce risk for human explorers of the Moon and beyond by conducting research and developing new technologies to aid future explorers. The Lunar Precursor Robotic Program will launch the Lunar Reconnaissance Orbiter (LRO) and the Lunar Crater Observing and Sensing Satellite (LCROSS). LRO will map and image the lunar surface and LCROSS will attempt to identify water in a permanently shadowed crater.

Space Operations

The President's FY 2010 budget funds the safe flight of the Space Shuttle to complete the ISS, and then retire the Shuttle. NASA is committed to completing the nine remaining scheduled shuttle flights, which we believe can be accomplished by the end of 2010. NASA's request for Space Operations is $6.2 billion in FY 2010, an increase of $0.4 billion from FY 2009 enacted.

Budget Authority ($ millions)	FY 2008 Actual	FY 2009 Enacted	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014
FY 2010 President's Budget Request	**5,427.2**	**5,764.7**	**6,175.6**	**3,663.8**	**3,485.3**	**3,318.6**	**3,154.8**
Space Shuttle	3,295.4	2,981.7	3,157.1	382.8	87.8		
International Space Station	1,685.5	2,060.2	2,267.0	2,548.2	2,651.6	2,568.9	2,405.9
Space and Flight Support (SFS)	446.2	722.8	751.5	732.7	745.9	749.7	748.9
FY 2009 President's Budget Request	**5,526.2**	**5,774.7**	**5,872.8**	**2,900.1**	**3,089.9**	**2,788.5**	**-**
Space Shuttle	3,266.7	2,981.7	2,983.7	95.7			-
International Space Station	1,813.2	2,060.2	2,277.0	2,176.4	2,448.2	2,143.1	-
Space and Flight Support (SFS)	446.3	732.8	612.1	628.0	641.7	645.4	-
Total Change from FY2009 President's Budget Request	**-99.0**	**-10.0**	**302.8**	**763.7**	**395.4**	**530.1**	

NASA and its Russian, Japanese, European, and Canadian ISS partners are working together to realize one of the most inspiring dreams of the last 50 years: the establishment of a station in Earth orbit for the conduct of various types of research. The recent delivery of the Station's final set of solar arrays and other equipment by the crew of STS-119 represents a key step toward this goal. Two significant milestones are now approaching. In May, the ISS will host its first six-person crew. In June, the STS-127 mission will deliver the third and final component of the Japanese *Kibo* laboratory. The addition of *Kibo's* Exposed Facility will join the European *Columbus* module and the U.S. *Destiny* module to complete the three major international science labs on ISS, setting the stage for utilization of ISS as a highly capable microgravity research facility.

The ISS is an unparalleled international cooperative effort and provides a U.S. National Laboratory in orbit. Scientists will be able to conduct biomedical and engineering research from a unique vantage point. Some of the work will increase our knowledge of the effects of long-duration human space flight, which is critical for the design and operation of future human space vehicles, including those being developed under the Constellation Program to return U.S. astronauts to the Moon and explore other destinations. Other research will not be focused on space exploration, but may have significant applications right here on Earth. Medical research, for example, may be applicable to the development of vaccines; NASA's research aboard the Space Shuttle and ISS into salmonella has already increased our knowledge in this area. In the key areas of energy and the environment, the ISS serves as a daily demonstration of "green" technologies and environmental management techniques. The ISS receives 120kW of power from its solar arrays to operate the Station and run experiments. The ISS environmental system is designed to minimize the amount of mass that has to be launched from Earth to support the Station, so recycling is a must. STS-119 supplied ISS with a replacement Distillation Assembly for Station's water recycling system, which is key for supporting a full six-person crew for extended periods of time. Given the central role science and technology play in our society, it is

important that the United States maintain a leadership role in these fields. The availability of a research laboratory in the microgravity environment of space will support this aim.

NASA is relying on U.S. industry to develop vehicles to deliver supplies and experiments to the ISS. In December 2008, the Agency awarded two Commercial Resupply Services (CRS) contracts for the provision of this critical capability. Cargo resupply is important for the continued viability and utilization of ISS. In addition, the vendors involved will gain valuable experience in the development and operation of vehicles that can (1) fly to the ISS orbit; (2) operate in close proximity to the ISS and other docked vehicles; (3) dock to ISS; and, (4) remain docked for extended periods of time.

Another important benefit from Space Shuttle missions and ISS research are ultimately reflected in the programs' ability to inspire the next generation of Americans. This was reflected recently in the delighted faces of students who participated in the uplinked phone call between President Obama and the crews of the ISS and STS-119 on March 24. The ISS will support the President's goal of making math and science education a national priority by demonstrating what can be accomplished through science and engineering, and by inspiring both teachers and students.

Space Communications provides the enabling communications services to NASA's human and robotic flight missions and addresses future sustainment/upgrade requirements for all the Agency's communications networks. Launch Services provides safe, reliable, cost-effective, and on-time launch services for NASA and NASA-sponsored payloads using expendable launch vehicles. The Rocket Propulsion Test Program reviews, approves and provides direction on rocket propulsion test assignments. Crew Health and Safety provides support to the provision of medical care for the Astronaut Corps and the Human Space Flight Operations provides trained crew members for all NASA human space flight endeavors.

Education

In FY 2010, NASA will continue its successes in developing a future aerospace workforce, improving the technological competitiveness of our Nation's universities, attracting and retaining students in science, technology, engineering and mathematics (STEM) disciplines, and engaging the public in NASA's missions. NASA will accomplish these goals by offering competitive research grants to universities, providing targeted educational support to Minority Serving Institutions (MSIs), and strengthening curricula at two-year community colleges. NASA's plans to streamline and centralize internship and fellowship application processes will realize cost savings and facilitate student access to information while attracting a wider, more diverse participant base. The Agency is also seeking new opportunities for student involvement in current space and aeronautics research missions and flight projects, including those using high altitude balloons, sounding rocket payloads, airborne sensors, and space satellites. NASA will further these efforts through a new project, Innovation in STEM Education, which will allow the Agency to investigate and offer opportunities for student and faculty to participate in NASA-related research. NASA's request for Education is $126 million in FY 2010.

Budget Authority ($ millions)	FY 2008 Actual	FY 2009 Enacted	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014
FY 2010 President's Budget Request	**146.8**	**169.2**	**126.1**	**123.8**	**123.8**	**123.8**	**125.5**
Education	146.8	169.2	126.1	123.8	123.8	123.8	125.5
FY 2009 President's Budget Request	**146.8**	**115.6**	**126.1**	**123.8**	**123.8**	**123.8**	-
Education	146.8	115.6	126.1	123.8	123.8	123.8	-
Total Change from FY2009 President's Budget Request	**0.0**	**53.6**	**0.0**	**0.0**	**0.0**	**0.0**	

NASA will further pursue a goal to attract and retain students in STEM disciplines in the upcoming fiscal year. Last year, the Interdisciplinary National Science Program Incorporating Research & Education (INSPIRE) program engaged over 200 high schools in STEM areas, and NASA Explorer Schools conducted instructional and enrichment activities that reached over 105,000 students. The March 2009 STS-119 mission also provided a unique educational opportunity as two Mission Specialists who are science teachers, Joe Acaba and Richard Arnold, were part of the crew. NASA Education continues to provide internships, fellowships, and research opportunities to help students and educators gain hands-on experiences in a range of STEM-related areas. These opportunities provide students with the motivation, inspiration, and experience needed to serve the Nation's current and future workforce needs. In FY 2008, the Agency provided more than 3,000 summer internships, reached 5,331 students through significant research experience or grants, and provided 139 grants to underrepresented and underserved institutions.

NASA will also engage elementary and secondary school and informal education audiences by using Earth and deep space observations, the flight experience of Educator Astronaut Dorothy Metcalf-Lindenburger aboard STS-131, as well as future missions to the Moon and other destinations. New technologies such as social networks, Internet collaborations, a new virtual magnet school, and remote control of science instruments will expand and enhance these efforts. In FY 2010, NASA also plans to provide an online professional development system for students training to become educators, in-service teachers, and informal educators. Additionally, NASA will promote continuous public awareness of its mission and improvement to STEM literacy by partnering with informal education providers, which allows Agency partners to share the excitement of NASA missions with their visitors in meaningful ways.

Cross-Agency Support

NASA Cross-Agency Support provides critical mission support activities that are necessary to ensure the efficient and effective operation and administration of the Agency but cannot be directly aligned to a specific program or project requirement. These important functions align and sustain institutional and program capabilities to support NASA missions by leveraging resources to meet mission needs, establishing Agency-wide capabilities, and providing institutional checks and balances. Cross-Agency Support includes Center Management and Operations, Institutional Investments, and Agency Management and Operations. NASA's request for Cross-Agency Support is $3.4 billion in FY 2010.

Budget Authority ($ millions)	FY 2008 Actual	FY 2009 Enacted	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014
FY 2010 President's Budget Request	**3,251.4**	**3,356.4**	**3,400.6**	**3,468.4**	**3,525.7**	**3,561.4**	**3,621.4**
Center Management and Ops	2,011.7	2,024.0	2,084.0	2,119.2	2,142.5	2,166.1	2,189.9
Agency Management and Ops	834.1	921.2	961.2	956.9	964.5	972.3	981.5
Institutional Investments	325.5	343.7	355.4	392.3	418.7	423.0	450.0
Congressionally Directed Items	80.0	67.5					
FY 2009 President's Budget Request	**3,242.9**	**3,299.9**	**3,323.9**	**3,363.7**	**3,436.1**	**3,511.3**	**-**
Center Management and Ops	2,013.0	2,045.6	2,046.7	2,088.0	2,155.3	2,211.6	-
Agency Management and Ops	830.2	945.6	945.5	939.8	950.5	961.3	-
Institutional Investments	319.7	308.7	331.7	335.9	330.4	338.3	-
Congressionally Directed Items	80.0						-
Total Change from FY2009 President's Budget Request	**8.5**	**56.5**	**76.7**	**104.7**	**89.6**	**50.1**	

Center Management and Operations funds the ongoing management, operations, and maintenance of nine NASA Centers and major component facilities. NASA Centers continue to provide high-quality support and the technical talent for the execution of programs and projects.

Institutional Investments funds design and execution of non-programmatic revitalization construction of facilities projects, demolition projects for closed facilities, and environmental compliance and restoration activities. The Construction of Facilities Program makes capital repairs and improvements to NASA's critical infrastructure to improve safety and security and improve NASA's operating efficiency by reducing utility usage. NASA continues to right size the infrastructure by demolishing facilities that are no longer needed. Emphasis has been placed on energy and water conservation. NASA currently has 5 buildings certified under the Leadership in Energy and Environmental Design (LEED) criteria, 3 additional buildings that are built and awaiting certification as LEED Silver facilities, and 13 buildings in various stages of design and construction as High Performance Buildings expected to be LEED-certified when completed.

Agency Management and Operations funds the management and oversight of Agency missions, programs, and functions, and performance of NASA-wide activities, through the following five programs:

- Agency Management supports executive-based, Agency-level functional and administrative management requirements. Agency Management provides for the operational costs of

Headquarters as an installation; funding and management of Agency-wide institutional and statutory requirements for centralized Agency functions; assessment and evaluation of NASA program and mission performance; strategic planning; and independent technical assessments of Agency programs.

- Safety and Mission Success funds activities required to strengthen and enable the fundamental and robust cross-checks applied on the execution of NASA's mission, and to improve the likelihood for safety and mission success for NASA's programs, projects, and operations. The engineering, safety and mission assurance, health and medical independent oversight, and technical authority components are essential to NASA's success and were established in direct response to the Challenger and Columbia shuttle accident board recommendations for independent funding of these efforts. Included under Safety and Mission Assurance is the Independent Verification and Validation program.

- Agency Information Technology Services funds cross-cutting services and initiatives in IT management, applications, and infrastructure necessary to enable the NASA Mission and improve security, integration and efficiency of Agency operations. NASA plans significant emphasis on implementation of five Agency-wide procurements to achieve the following: (1) consolidation of IT networks to improve network management, (2) consolidation of desktop/laptop computer services and mobile devices to improve end-user services, (3) data center consolidation to provide more cost-effective services, (4) Agency public web site management to improve access to NASA data and information by the public, and (5) Agency business systems development and maintenance to provide more efficient and effective business systems. NASA will also continue to improve security incident detection, response, and management through the Security Operations Center.

- The Innovative Partnerships Program (IPP) funds leveraged technology investments, dual-use technology-related partnerships, and technology solutions for NASA. IPP implements NASA's Small Business Innovation Research and Small Business Technology Transfer Programs which seek out high-technology small businesses to address key technology needs for NASA, and facilitates the protection of NASA's rights in its inventions and the transfer of that technology for commercial application and public benefit. IPP is establishing a new Innovative Technology Project that is intended to identify and competitively select low-maturity basic research projects that can enable new and more capable missions in the future. IPP manages a Seed Fund to address technology needs through cost-shared, joint-development partnerships and the Centennial Challenges Program to stimulate innovation and competition in space operations, exploration and aeronautics technologies of value to NASA and the nation through prize contests. Centennial Challenge competitions have spurred the creation of new businesses and products, including innovations in pressure suit gloves and reusable rocket engines. IPP also transfers NASA technology to industry for public benefit; in 2008, 50 new examples of transfer of NASA innovation to the commercial market place were publicized in areas such as health and medicine, transportation, public safety, consumer goods, homes and recreation, environmental and agricultural resources, computer technology, and industrial productivity.

- The Strategic Capabilities Assets Program (SCAP) funds the costs required to sustain key Agency test capabilities and assets, such as an array of flight simulators, thermal vacuum chambers, and arc jets, to ensure mission success. SCAP ensures that assets and capabilities deemed vital to NASA's current and future success are sustained in order to serve Agency and national needs. All assets and capabilities identified for sustainment either have validated mission requirements or have been identified as potentially required for future missions.