



Space Telescope User's Committee

Astrophysics Division Status

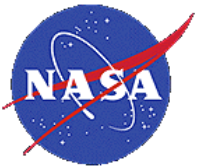
April 13, 2007

Jeffrey Hayes

HST Program Scientist & Exec for Operations

Astrophysics Division, SMD

NASA HQ



Significant Events

- HST ACS redundant electronics failed Jan 27; WFC & HRC unrecoverable.
- JWST Technology NAR (T-NAR) - Jan 30-31 @ GSFC.
- BEPAC (Beyond Einstein Program Assessment Committee) met Jan 30 - Feb 1 @ Newport Beach, CA.
- The First GLAST Symposium - Feb 5-8 @ Stanford University.
- AAAC meeting - Feb 8-9 @ L'Enfant Plaza Hotel, Washington, DC.
- Mario Livio's "Astrophysics Enabled by the Return to the Moon" talk at HQ - Feb 9.
- HQ Great Hall Display (1st floor) "HST: Birth, Life, Destruction" debuted Feb 12.
- Kepler Tabletop Review with Luther - Feb 13.
- CSA/NASA Astrophysics Bilateral Meeting - Feb 13.
- HST recovers ACS Solar Blind Channel for observations - Feb 19.
- ExoPTF First Meeting - Feb 20-21 @ NSF/NASA HQ.
- NAC Astrophysics Subcommittee meeting - Feb 26 @ Tempe, AZ.
- SOFIA SMOR first meeting - Feb 26-27 @ ARC.
- Great Observatory Proposal cycle closed with HST=821, Chandra=~666, and Spitzer=~910 proposals.
- ESA Cosmic Vision 2015-2025 Call for Proposals released - Mar 5.
- WISE Tabletop review with Luther - Mar 13.
- SOFIA Airworthiness Flight SRB - Mar 15 @ DFRC.



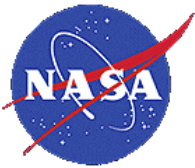
Future Significant Events

- WISE Spacecraft CDR - Apr 3-5.
- BEPAC Meeting and Town Hall - Apr 4-7 @ Chicago, IL.
- ExoPlanet Task Force Meeting - Apr 10-11 @ MIT.
- GP-B results discussed at the Am. Physical Society meeting Apr 14-17.
- HST SM4 Mission CDR/TRR - Apr 17-18 @ GSFC.
- HST ACS repair options to Griffin - Apr. (TBD)
- SOFIA first functional checkout flight - TBD.
- SOFIA rechristening event (under review) - May 21 @ DFRC.
- SOFIA Baseline Review to Agency PMC - May 23 @ DRFC.



Administrative

- Jon Morse new Astrophysics Division Director starting April 2 (Rick Howard returns to Deputy Director position).



Astrophysics Division Developmental Missions Status

<i>Project</i>	<i>Launch</i>	<i>Dec</i>	<i>Jan</i>	<i>Feb</i>	<i>STATUS</i>
Keck Intrfrmrtr	N/A	Y	G	G	Development complete, transitioning to operations.
Keck Outrigger	N/A	R	R	R	Discussions with USNO of Navy support for installation at Navy Prototype Interferometer Array in Flagstaff.
SOFIA	TBD	Y	Y	Y	Program restructured. Contracts restructured. Focus on first flight and ferry flight. Science management and operations under review.
LBTI	Dec 2009 init. capability	G	G	G	Major delays on LBO due to active secondary manufacturing.
GLAST	NET Nov 2007	G	G	G	S/C bus almost complete. Antenna Pointing Assembly readout noise problem being corrected. S/C C&DH subsystem is the critical path, pacing start of Observatory I&T.
HST SM-4	Sep 2008	G	G	G	Program Office notified to work to 9-11-08 SM-4 LRD. Funding for four months slip for SM-4 currently TBD. ACS repair options under study.
Herschel	NET Jul 2008	G	G	G	Undergoing Integration and Test.
Planck	NET Jul 2008	G	G	G	Undergoing Integration and Test.
Kepler	Nov 2008	Y	Y	Y	Continued technical issues, schedule pressure, and reduction in schedule reserves. S/C structure and Prime optics Corrector complete.
WISE	2009	G	G	G	All Phase C contracts are now underway.
JWST	2013	Y	Y	Y	Still awaiting DoS response to ESA & CSA TAA concerns. PM EDU and A1 segment figure degradation cause and fixes under investigation.
SIM	TBD	G	G	G	EM#5 completed and accepted by HQ.
LISA	TBD	G	G	G	Preparation underway for upcoming BEPAC Review.
Con-X	TBD	G	G	G	Preparation underway for upcoming BEPAC Review.
TPF	TBD	G	G	G	TPF-C looking at design options for smaller mission. TPF-C/I writing white papers to be submitted to Exo-Planet Task Force.
Balloons	on-going	G	G	G	Ft Sumner campaign planned for early April 07 start. Review teams investigating Antarctica/Sweden flt anomalies. Miniature ULDB indoor test flt planned for Mar 07
MSC	N/A	G	G	G	Pilot project to process HIRES-0 data to level 1 underway. To date 81 nights of archived data have been reduced by the automated pipeline.



Astrophysics Division Operating Missions Status

<i>Column1</i>	<i>aunch/EOM</i>	<i>Feb2</i>	<i>Mar2</i>	<i>Apr</i>	<i>STATUS</i>
HST (Extended)	4-25-90 2010	G	G	G	STUC meeting at STScI 4/12-13
Rossi XTE (Extended)	12-30-95 2-28-09	G	G	G	RXTE Cycle 12 Peer Review, April 10-11
FUSE (Extended)	6-24-99 9-30-08	G	G	G	
Chandra (Extended)	7-19-99 7-19-10	G	G	G	
XMM-Newton (Extended)	12-9-99 9-30-10	G	G	G	
WMAP (Extended)	6-30-01 9-30-09	G	G	G	
Integral (Extended)	10-17-02 9-30-10	G	G	G	
GALEX (Extended)	4-28-03 9-30-10	G	G	G	
Spitzer (Extended-Prime)	8-25-03 3-31-09	G	G	G	
GP-B (DA mode)	4-20-04 8-30-05	G	G	G	Preliminary results to be announced at Jacksonville APS, FL, April 14
Swift (Extended)	11-20-04 9-30-10	G	G	G	
Suzaku (Prime)	7-9-05 9-30-10	G	G	G	

FY2008 NASA Budget (\$M)



	FY2006	* FY2007	FY2008	FY2009	FY2010	FY2011	FY2012
Total NASA	\$16,658.0	\$16,792.3	\$17,309.4	\$17,614.2	\$18,026.3	\$18,460.4	\$18,905.0
Science	\$5,244.6	\$5,466.8	\$5,516.1	\$5,555.3	\$5,600.6	\$5,656.9	\$5,802.7
Planetary Science	\$1,298.9	\$1,411.2	\$1,395.8	\$1,676.9	\$1,720.3	\$1,738.3	\$1,748.2
Heliophysics	\$1,067.3	\$1,028.1	\$1,057.2	\$1,028.4	\$1,091.3	\$1,241.2	\$1,307.5
Astrophysics	\$1,552.8	\$1,563.0	\$1,565.8	\$1,304.2	\$1,268.9	\$1,266.2	\$1,393.8
Earth Science	\$1,325.6	\$1,464.5	\$1,497.3	\$1,545.8	\$1,520.1	\$1,411.2	\$1,353.2
Exploration Systems	\$3,050.1	\$4,152.5	\$3,923.8	\$4,312.8	\$4,757.8	\$8,725.2	\$9,076.8
Constellation Systems	\$1,733.5	\$3,232.5	\$3,068.0	\$3,451.2	\$3,784.9	\$7,666.0	\$7,993.0
Advanced Capabilities	\$1,316.6	\$920.0	\$855.8	\$861.6	\$973.0	\$1,059.1	\$1,083.9
Aeronautics Research	\$893.2	\$529.3	\$554.0	\$546.7	\$545.3	\$549.8	\$554.7
Space Operations	\$6,904.7	\$6,108.3	\$6,791.7	\$6,710.3	\$6,625.7	\$3,036.6	\$2,978.0
Space Shuttle	\$4,812.5	\$4,017.6	\$4,007.5	\$3,650.9	\$3,634.4	\$116.2	\$0.0
International Space Station	\$1,753.4	\$1,762.6	\$2,238.6	\$2,515.1	\$2,609.2	\$2,547.5	\$2,600.8
Space and Flight Support (SFS)	\$338.8	\$328.1	\$545.7	\$544.3	\$382.0	\$372.9	\$377.2
Inspector General	\$32.0	\$33.5	\$34.6	\$35.5	\$36.4	\$37.3	\$38.3
Cross-Agency Support Programs	\$533.4	\$502.0	\$489.2	\$453.5	\$460.4	\$454.7	\$454.4
Education Theme	\$162.4	\$167.4	\$153.7	\$152.8	\$152.7	\$149.8	\$149.6
Advanced Business Systems (IEMP)	\$156.3	\$97.4	\$103.1	\$69.4	\$71.6	\$67.6	\$67.5
Innovative Partnerships Program	\$214.8	\$215.1	\$198.1	\$197.2	\$199.8	\$200.0	\$200.0
Shared Capability Assets Program	\$0.0	\$22.1	\$34.3	\$34.2	\$36.2	\$37.3	\$37.2

* FY2007 is President's Budget, adjusted for Full Cost Simplification. Does not reflect full-year CR or current planning.



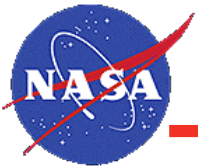
Astrophysics Division Budget (Proposed FY08 President's Budget vs FY07 President's Budget)

What's Changed:

- SOFIA mission reinstated with ~2010 Initial Operations Capability (IOC) and ~2013 Full Operations Capability (FOC) .
- Navigator Program re-focused; funds core interferometry, related planet-finding science, and project risk reduction efforts via remaining SIM funding, limited TPF funding, and ground-based projects (Keck and LBTI).
- Reserves added to JWST in 2008 and 2009.
- Budget for HST supports May 2008 SM4: working to identify additional funding to support September 2008 Shuttle manifest.
- Funds Kepler (LRD NET November 2008) and GLAST (LRD NET November 2007) replans due to cost growth, schedule slip.
- WISE entered development in October 2006 (LRD NET November 2009).
- New "Future Missions" wedge added to be available for the highest priority Decadal Survey mission(s).
- Beyond Einstein Program Assessment Committee (BEPAC) formed to determine which mission (LISA, Con-X, JDEM, Inflation Probe or Black Hole Finder) will be selected to proceed first; results available ~ September 2007.
- Herschel and Planck launch delayed until NET July 2008.

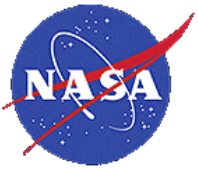
What's Stayed the Same:

- All operating missions continue to produce science results.
- Maintains FY07 R&A funding levels.

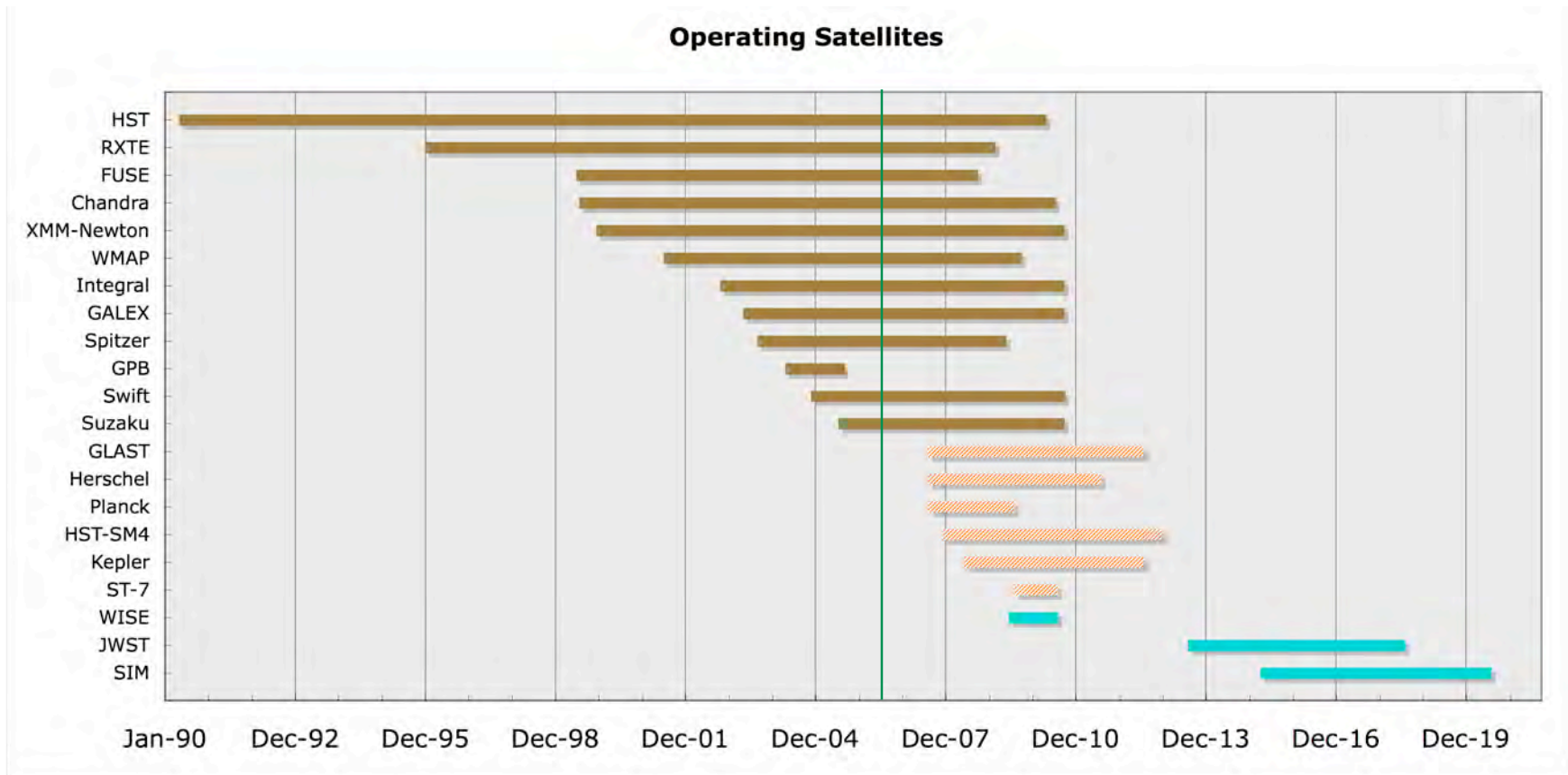


Astrophysics Missions

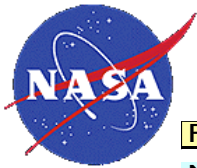
<u>Mission</u>	<u>Launch</u>	<u>07 IBPD</u>	<u>Phase</u>	<u>End of Prime</u>
HST	Apr-90	same	Implementation - Extended Operations	Apr-05
RXTE	Dec-95	same	Implementation - Extended Operations	Jan-98
FUSE	Jun-99	same	Implementation - Extended Operations	Mar-03
Chandra	Jul-99	same	Implementation - Extended Operations	Jul-04
XMM	Dec-99	same	Implementation - Extended Operations	Dec-04
HETE-2	Oct-00	same	Implementation - Extended Operations	Oct-01
WMAP	Jun-01	same	Implementation - Extended Operations	Sep-03
Integral	Oct-02	same	Implementation - Extended Operations	Sep-04
GALEX	Apr-03	same	Implementation - Extended Operations	Aug-05
Swift	Nov-04	same	Implementation - Extended Operations	Jan-07
Spitzer	Aug-03	same	Implementation - Extended Operations	May-06
Gravity Probe - B	Apr-04	same	Implementation - Post-Op Data Analysis	Sep-05
Astro-E2/Suzaku	Jul-05	same	Implementation - Prime Operations	Feb-08
Herschel	Jul-08	Jul-07	Implementation - Development	
Planck	Jul-08	Jul-07	Implementation - Development	
GLAST	Nov-07	Sep-07	Implementation - Development	
HST SM4	May-08	Dec-07	Implementation - Development	
Kepler	Nov-08	Jun-08	Implementation - Development	
WISE	Nov-09	Jun-09	Implementation - Development	
JWST	Jun-13	same	Formulation	
SIM	TBD	2015/16	Formulation	
LISA	TBD	TBD	Formulation	
Con-X	TBD	TBD	Pre-Formulation	
JDEM	TBD	TBD	Pre-Formulation	
TPF	TBD	TBD	Pre-Formulation	
SOFIA	2013	N/A	Implementation - Development	



Astrophysics Division

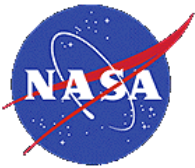


Tan: mission in development, blue: mission in formulation



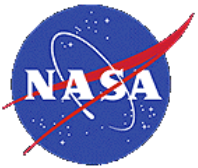
Astrophysics: Content of FY08 Budget

	FY07	FY08	FY09	FY10	FY11	FY12
FY 08 President's Budget	1,563.0	1,565.8	1,304.2	1,268.9	1,266.2	1,393.8
Navigator	124.7	57.1	58.4	59.5	61.0	62.5
SIM	94.2	20.2	20.7	22.0	22.3	22.6
Keck Interferometer / Single Aperture / Ops	10.0	13.0	11.8	10.5	10.3	10.7
TPF	0.0	6.1	6.2	6.3	6.4	6.5
Other Navigator	12.4	13.6	15.4	16.4	17.7	18.3
Institutional	8.0	4.3	4.3	4.3	4.3	4.5
JWST	468.5	545.4	452.1	376.9	321.1	285.9
Direct	391.0	447.5	372.0	311.1	265.1	236.2
Institutional	77.5	98.0	80.1	65.7	55.9	49.7
Hubble Space Telescope	343.0	277.7	165.2	152.8	151.4	151.3
Development	188.9	136.6	45.8	37.6	35.9	35.0
Operations and Data Analysis	95.6	90.0	89.5	88.1	88.9	89.8
Institutional	58.5	51.1	29.9	27.1	26.7	26.5
SOFIA	0.0	77.3	89.1	88.6	89.9	92.1
Direct	0.0	63.1	72.9	72.9	74.1	75.9
Institutional	0.0	14.2	16.1	15.7	15.8	16.2
GLAST	90.7	42.2	28.3	28.3	29.3	30.2
Direct	75.2	34.4	23.2	23.3	24.1	24.9
Institutional	15.5	7.8	5.1	5.0	5.2	5.3
Discovery	105.0	93.0	25.7	16.3	16.2	17.6
Kepler	89.2	79.5	21.4	13.4	13.3	14.5
Institutional	15.7	13.5	4.4	2.9	2.9	3.1
*Astrophysics Explorer	69.4	99.1	88.8	28.2	11.7	5.7
WISE	52.7	72.7	65.2	13.0	5.2	1.6
Swift, Suzaku	9.1	13.1	11.4	11.7	5.1	3.2
Institutional	7.6	13.2	12.2	3.5	1.4	0.8
Astrophysics Research	319.8	315.2	306.1	331.9	378.5	491.4
Research and Analysis	50.0	47.5	48.9	46.2	48.1	49.8
Chandra	61.1	62.9	65.0	67.8	68.5	70.2
Spitzer	76.3	75.4	71.7	48.9	44.3	43.2
Astrophysics Future Missions			0.2	42.7	78.1	164.6
Other Operating Missions / D A / Archives	67.8	60.0	50.9	50.7	55.5	58.6
Balloons	19.8	22.0	24.1	23.9	23.8	25.1
Institutional	44.8	47.4	45.3	51.8	60.1	79.7
ISSC	19.8	26.5	39.1	38.7	36.5	35.2
Herschel & Planck	18.5	24.8	36.6	36.3	34.2	33.0
Institutional	1.3	1.7	2.5	2.4	2.3	2.2
Beyond Einstein	22.1	32.3	51.5	147.6	170.6	222.1
Direct	18.3	26.5	42.3	121.5	140.7	183.2
Institutional	3.8	5.8	9.2	26.1	29.9	38.8
*Future Explorer (non-add; in Heliophysics)	9.1	11.6	47.8	110.4	154.3	172.5



FY 2007 President's Budget (Astrophysics Budget Changes)

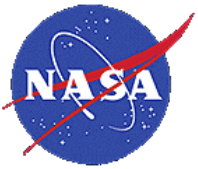
	<u>FY 2006</u>	<u>FY 2007</u>	<u>FY 2008</u>	<u>FY 2009</u>	<u>FY 2010</u>	<u>TOTAL</u>
FY 2006 PRESIDENT'S BUDGET	1,512.2	1,531.5	1,539.4	1,495.0	1,406.7	7,484.9
FY 2007 PRESIDENT'S BUDGET	1,507.9	1,509.2	1,500.9	1,307.9	1,276.1	7,101.9
Changes	(4.3)	(22.3)	(38.5)	(187.2)	(130.6)	(382.9)
James Webb Space Telescope (JWST)	(7.5)	70.6	164.0	153.9	163.6	544.6
Hubble Space Telescope (HST)	77.9	118.5	159.0	(8.8)	25.3	371.9
Gamma-ray Large Space Telescope (GLAST)	26.5	18.7	1.3	9.5	3.5	59.5
Discovery (Kepler)	19.7	24.2	53.1	0.3	(1.1)	96.2
Universe Explorers (incl WISE)	(15.4)	(8.5)	26.7	45.1	9.4	57.3
International Space Science Collab. (Herschel, Planck)	0.0	(2.5)	(15.3)	0.3	4.0	(13.5)
Navigator (SIM, TPF, Keck)	(54.0)	(118.5)	(223.9)	(155.2)	(172.5)	(724.1)
Beyond Einstein (LISA, Con-X, Einstein Probes)	(41.3)	(62.7)	(143.1)	(166.6)	(95.3)	(509.0)
Stratospheric Observatory for Infrared Astronomy (SOFIA)	(0.3)	(57.1)	(59.4)	(60.2)	(60.4)	(237.4)
Universe Research	(9.9)	(5.0)	(0.1)	(5.4)	(7.5)	(27.9)



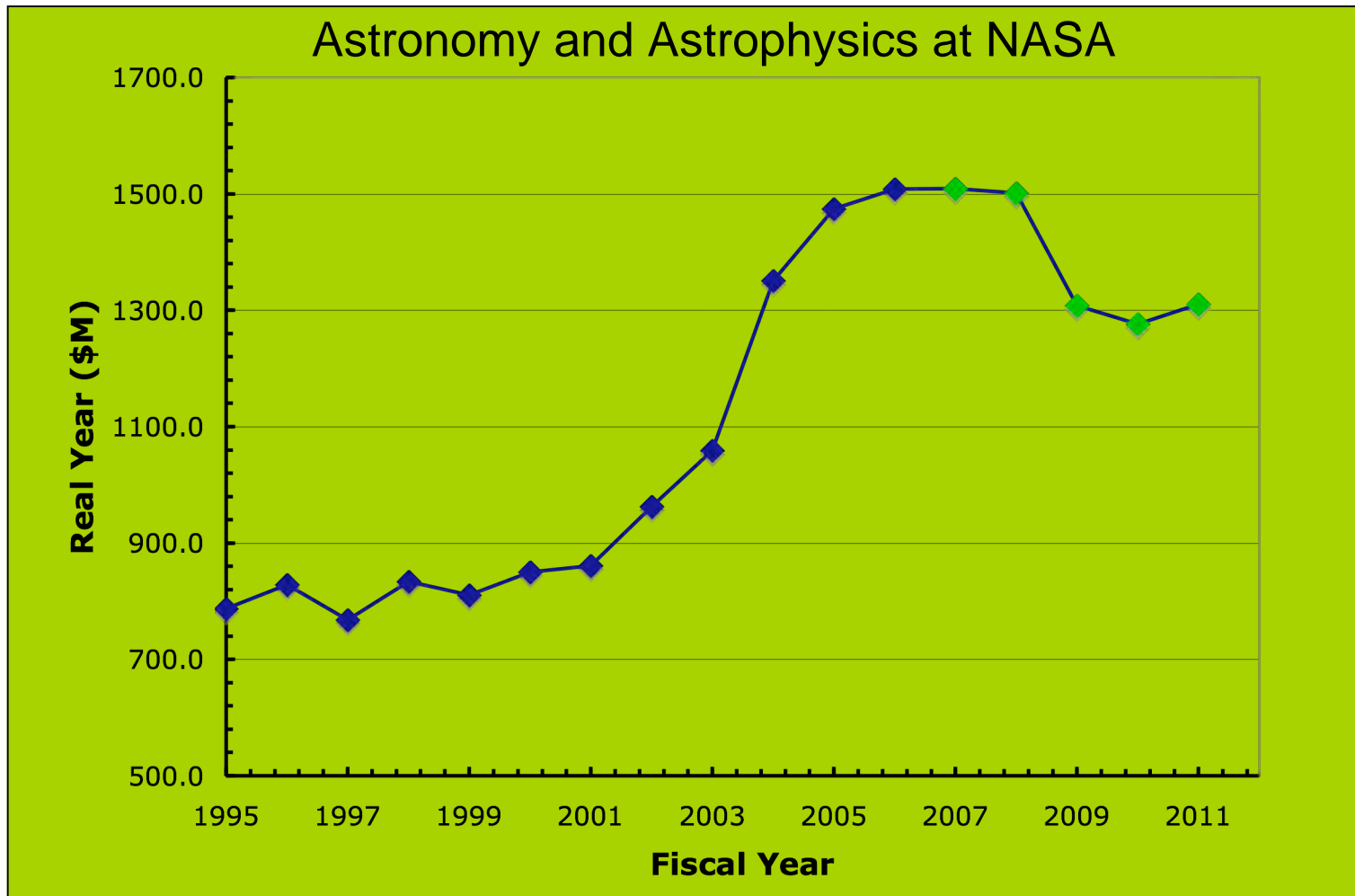
Astrophysics Division Budget Problems and Issues (status as of 1/07)

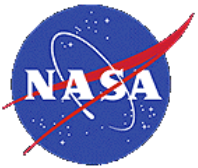
Budget problems and issues that must be dealt with during spring 2007 budget formulation:

- √ – Additional funding in slip of HST SM-4 launch date beyond 12/07.
- √ – Level of near term contingency for JWST.
- √ – Funds required for SOFIA that support final decision on path forward.
- √ – Additional funds to cover expected GLAST replan.
- √ – Potential cost growth in Kepler.
- √ – Restoration (full or partial) of cut to R&A program.
 - Adjustments to mix within Navigator program (TPF issue).
 - Direction within balloon program on future plan for ULDBs.



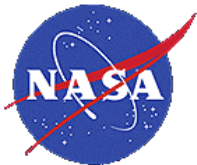
Funding, Historical and Proposed





NASA Authorization Act of 2005 (S. 1281)

- Section 101: Science
 - The Administrator shall develop a plan to guide the science programs of NASA through 2016
 - The plan shall be designed to ensure that NASA has a rich and vigorous set of science activities, and shall describe— (A) the missions NASA will initiate, design, develop, launch, or operate in space science and earth science through fiscal year 2016, including launch dates; (B) a priority ranking of all of the missions listed under subparagraph (A), and the rationale for the ranking.
- Section 103: Baselines and Cost Controls
 - Parts (d) (e), 15 and 30% projected increases above development costs require for (15%) notification of House Committee on Science plus description of why the increases occurred and the plan forward or (30%) no further spending on the program may occur unless the Congress has subsequently authorized continuation of the program by law.



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Other groups, unique names only:
 Universe Working Group (16)
 Decadal "rolling review team" (~10)

Blue font indicates AAS membership (~85 total)
 More than 120 individuals involved in the process

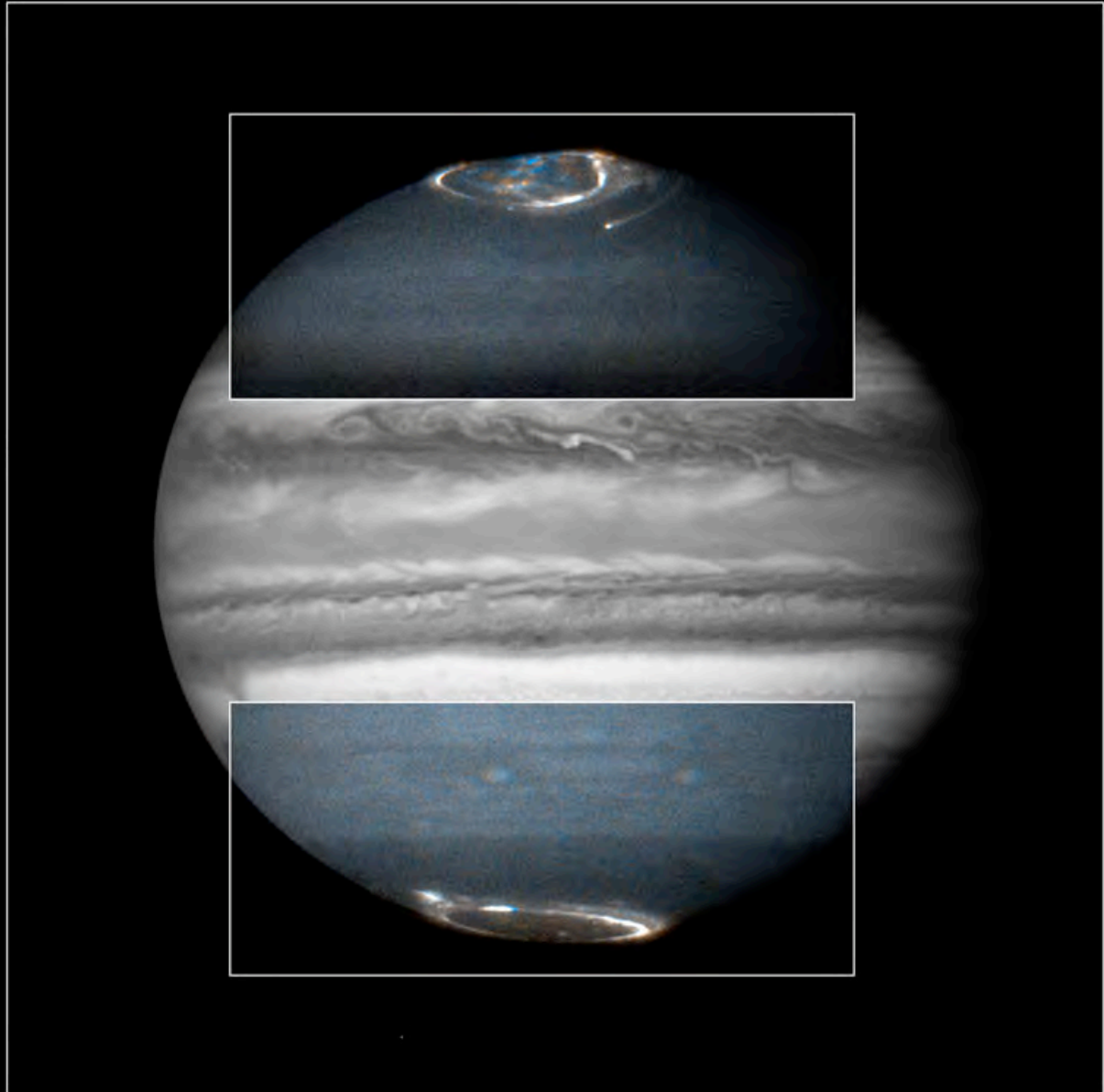
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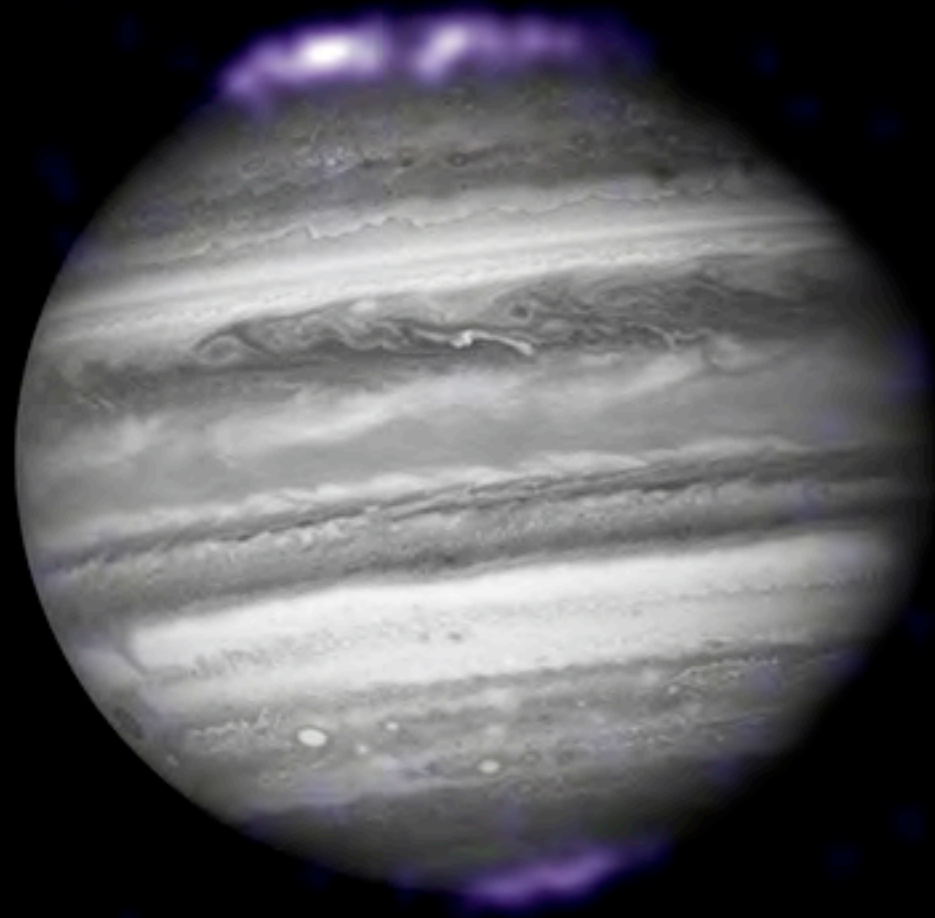
Astrophysics Subcommittee

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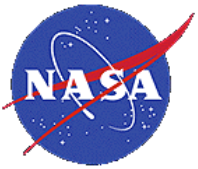


Jupiter Aurora
Hubble Space Telescope • ACS/SBC • WFPC2

Chandra: Jupiter



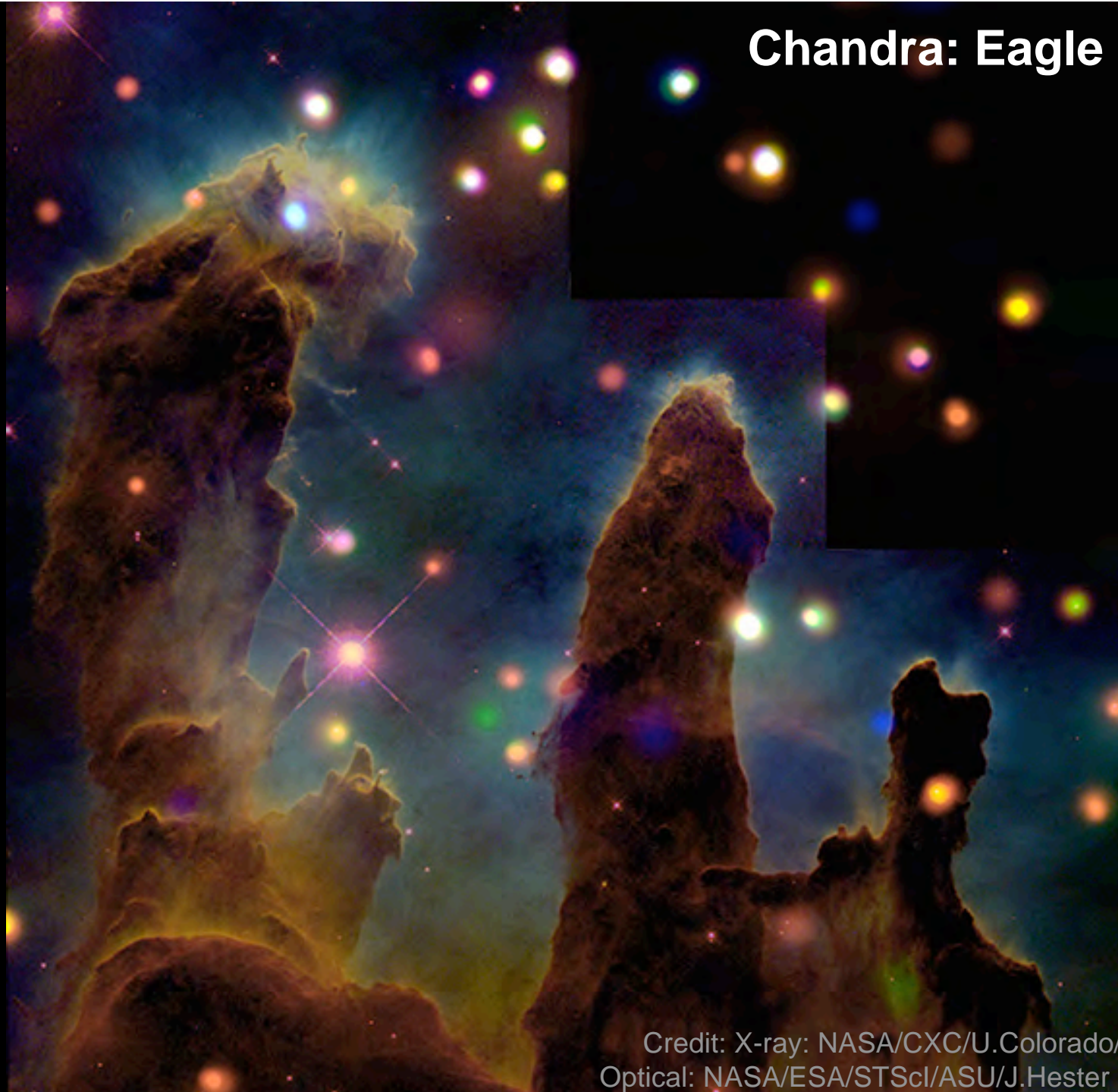
Credit: X-ray:
NASA/CXC/SwRI/R.Gladstone et al.;
Optical: NASA/ESA/Hubble Heritage
(AURA/STScI)



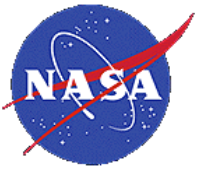
Astrophysics Division Press and Science



Chandra: Eagle Nebula



Credit: X-ray: NASA/CXC/U.Colorado/Linsky et al.;
Optical: NASA/ESA/STScI/ASU/J.Hester & P.Scowen.



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HQ Media Telecons and Press Releases, and things of note:

- 3/29: Spitzer observations show that planetary systems -- dusty disks of asteroids, comets, and possibly planets -- are at least as abundant in twin-star systems as they are in single-star system. Since more than half of all stars are twins, or binaries, the finding suggests the universe may be packed with planets that have two suns. Sunsets on some of those worlds would resemble the ones on Luke Skywalker's planet, Tatooine, where two fiery balls dip below the horizon one by one.





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- 3/29: Using NASA's Chandra X-ray Observatory, a team of scientists has shed new light on a galaxy system known as 3C442A. They discovered there is not just one galaxy near the middle of 3C442A, but two in the process of merging. These two galaxies are on their second pass toward a collision, having already experienced a close encounter.

