NASA HQ Perspective

Eric Smith
Astrophysics Division
Science Mission Directorate
NASA Headquarters

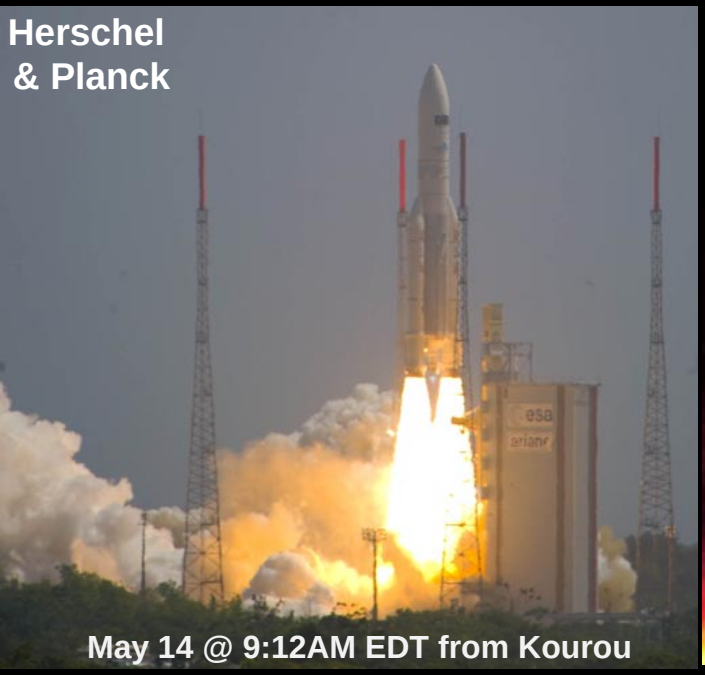
June 16, 2009

HST
SM-4

LEE (Sweden) + CREST &
NCT (Ft Sumner)

Kepler

Herschel
& Planck



May 14 @ 9:12AM EDT from Kourou

Spitzer cryo

Mar 6 @ 10:48 PMEDT from KSC

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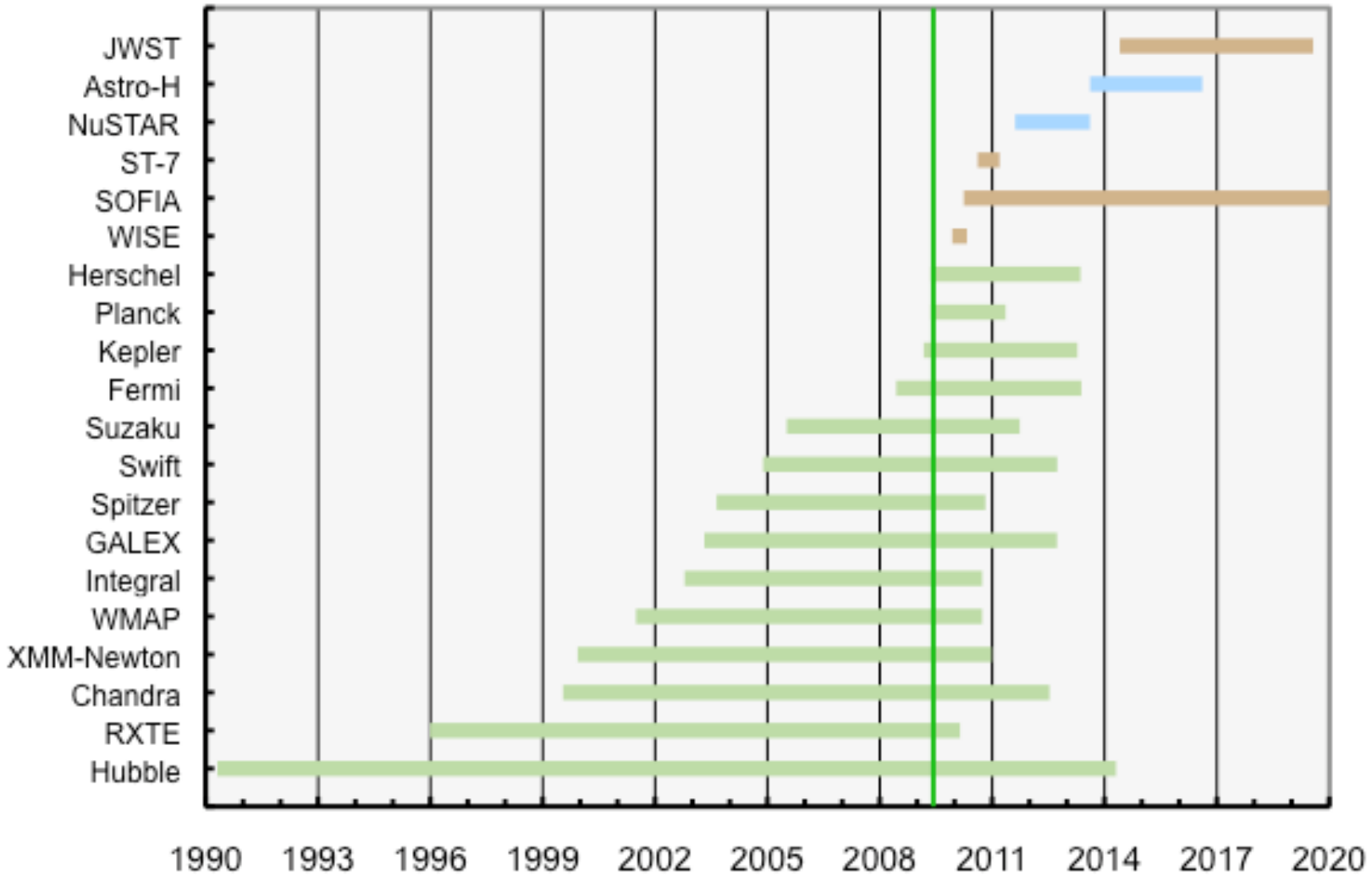
Astrophysics Missions



Green: Operating, Tan: Development, Blue: Formulation

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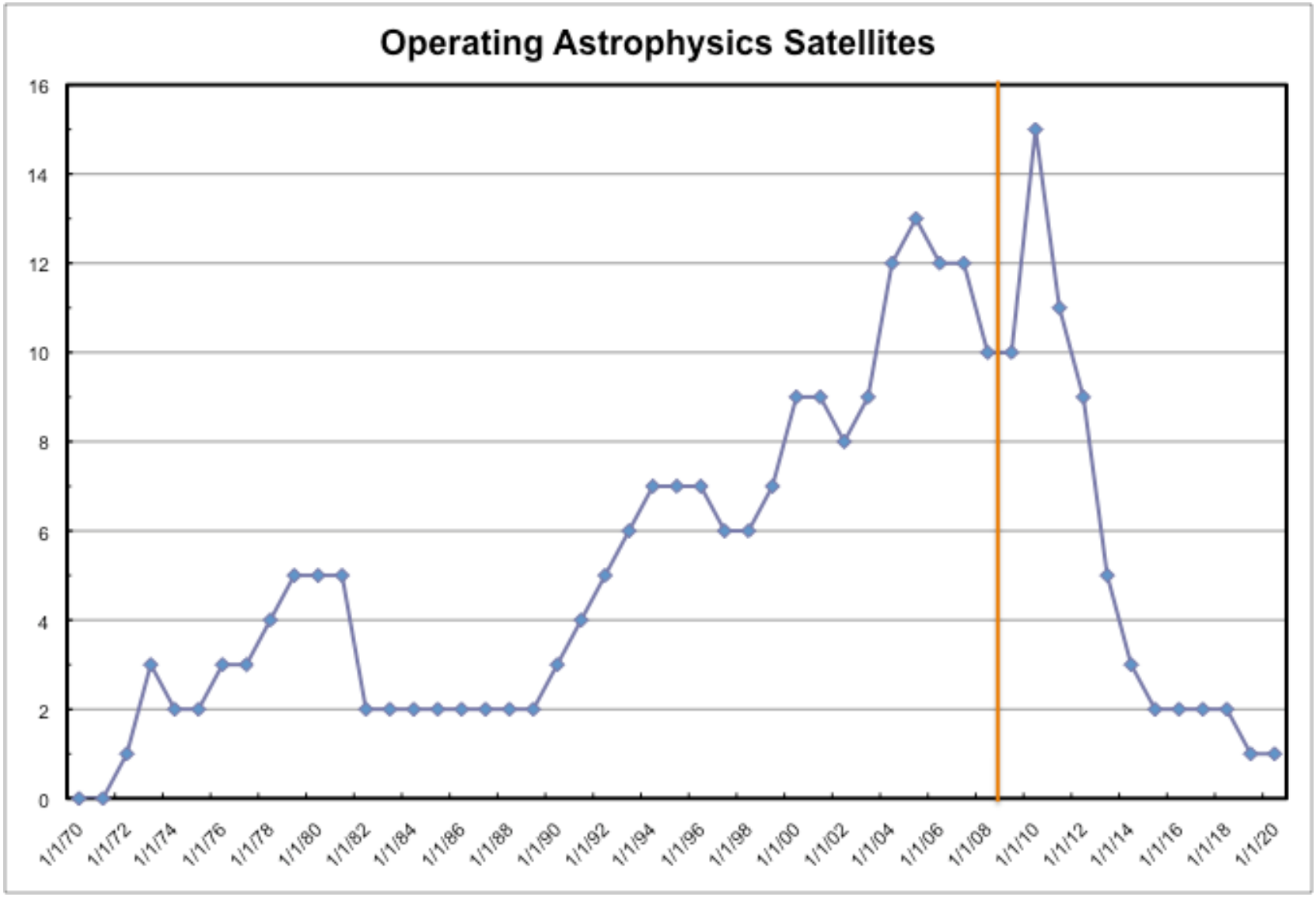
Astrophysics Division Future Missions



* Projections based on budget projections and missions currently in *development*

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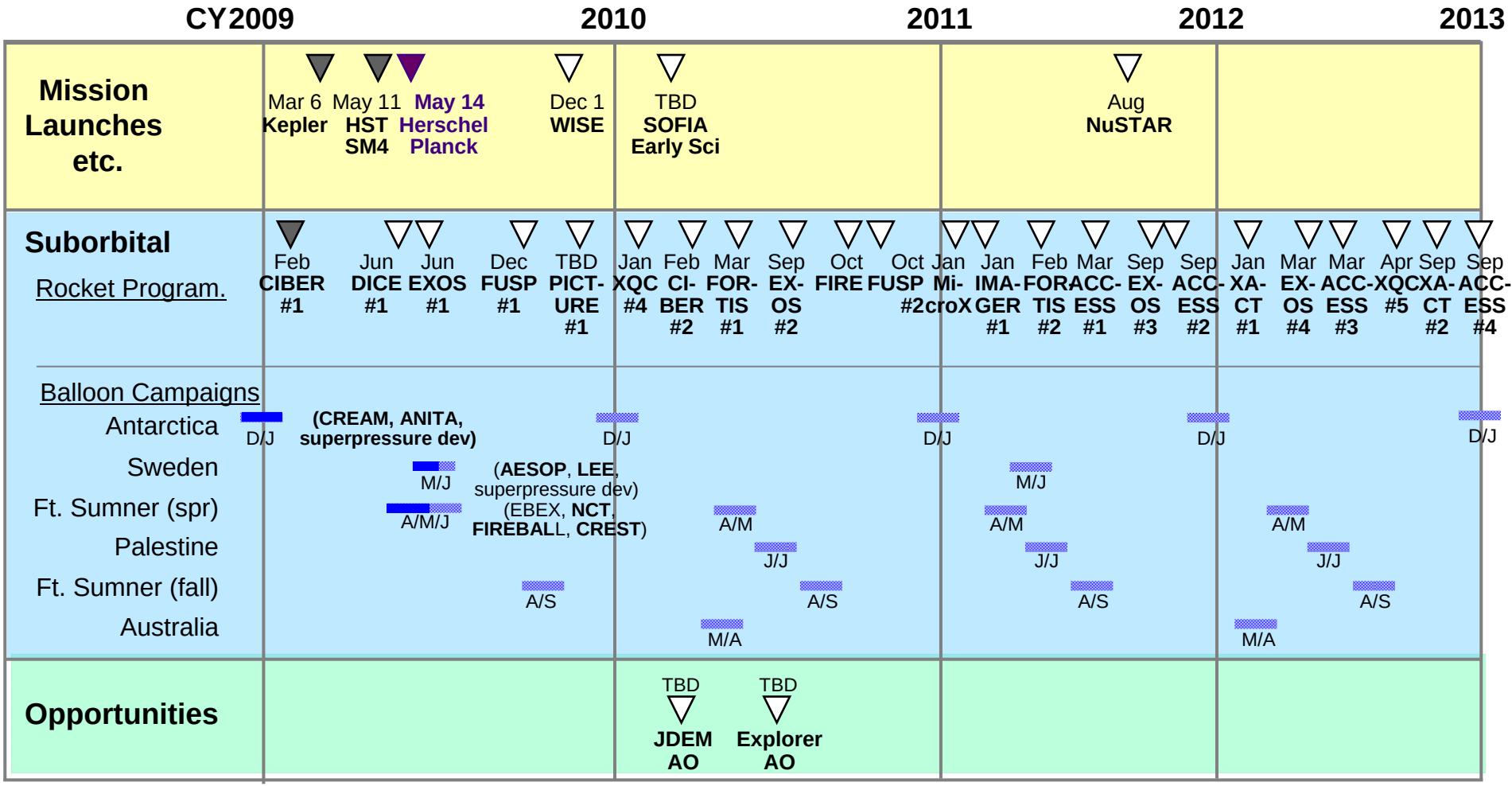
Astrophysics Mission Events



Last Updated: June 9, 2009

Legend
Purple - Mission with International lead
***** Student Opportunity balloon flight

Astrophysics Division

Other Astrophysics Division News

- **WISE**
  - S/C thermal vacuum test completed with no major issues.
  - **Payload integrated to the S/C.**
  - **Launch Readiness Date of 12-1-09 from Vandenberg AFB.**
- **SOFIA**
  - Nighttime telescope line operations to test operations and tracking of stars.
  - Erick Young named science mission operations director.

- **JWST**
  - **Core Thermal test has completed (cryo vacuum test of full-scale rep of the core region of the observatory).**
  - NIRCAM mount redesign CDR completed.
  - First mirror segment completed cryo testing.
  - ISIM approved for full-scale implementation (CDR March 12, 2009).

- **Personnel Changes**
  - IPAs Zlatan Tsvetanov has returned to Johns Hopkins University.
  - Doug Hudgins was hired as the Exoplanet Exploration Program Scientist (May 2009).

Astrophysics Division

Astrophysics Program Content

	FY09	FY10	FY11	FY12	FY13	FY14
FY10 President Submit	1,281.3	1,120.9	1,074.1	1,042.8	1,126.3	1,139.6
Cosmic Origins	819.2	667.2	598.9	550.3	523.8	452.3
James Webb Space Telescope	446.9	441.4	385.1	354.6	335.6	259.8
HST	207.7	112.6	101.6	94.6	91.1	93.2
SOFIA	72.8	72.8	74.0	75.8	77.6	79.1
Spitzer	71.7	27.1	23.9	8.2	0.3	
SR&T		5.2	6.7	9.6	11.5	12.5
Future Missions	20.0	8.1	7.6	7.5	7.7	7.7
Physics of the Cosmos	128.3	147.7	188.5	213.9	291.4	330.3
Fermi (GLAST)	13.2	22.2	23.0	23.8	24.0	24.5
Herschel / Planck	23.6	31.9	29.6	29.4	27.3	14.4
Chandra / GP-B / INTEGRAL / XMM	69.7	66.1	62.5	58.0	55.3	58.7
JDEM	8.5	6.4				
SR&T	2.8	4.9	7.2	9.2	11.2	12.5
LISA, Con-X, Future and Management	10.5	16.2	66.2	93.5	173.7	220.2
Exoplanet Exploration	68.1	46.2	57.3	86.9	123.5	167.3
Kepler	25.2	20.1	14.8	14.3	8.6	
SIM	20.0	2.0				
SR&T	11.0	13.3	12.7	14.2	15.5	15.9
Future Missions/Keck/LBTI/ Management	12.0	10.8	29.8	58.4	99.4	151.5
Astrophysics Explorer	130.7	107.9	69.5	26.6	10.4	1.7
WISE	65.2	13.0	5.2	1.6	0.2	
NuSTAR	38.7	59.5	33.7	6.8	6.4	
Astro-H / SXS	9.9	10.9	11.3	3.1	3.8	1.7
Operating Explorers	16.9	24.4	19.3	15.1		
Astrophysics Research	135.0	151.9	160.0	165.0	177.2	188.0
Research and Analysis	60.0	61.1	62.5	64.0	66.2	67.8
ADCAR / ADP / Senior Review	28.0	37.3	41.4	41.5	51.0	56.9
Balloons	24.6	26.7	28.8	32.4	33.2	35.8
SMD Administrative	22.4	26.9	27.2	27.0	26.9	27.5

Astrophysics Budget Changes

	FY09	FY10	FY11	FY12	FY13	Total
Program Changes from FY09	118.8	-1.5	17.1	-25.0	10.3	119.6
JWST	75.0	130.3	120.0	118.5	140.7	584.5
SOFIA			17.0	17.0	17.0	51.0
HST	52.8	-13.0	-13.1	-0.1	-2.9	23.7
Cosmic Origins Future	-3.0	-42.5	-67.3	-91.7	-104.5	-309.1
Exoplanet Exploration	20.0	-21.5	-11.1	-9.5	-2.7	-24.9
JDEM		-56.6	-83.0	-109.0	-125.0	-373.6
LISA / Con-X / PCOS Future	-5.1	-17.8	24.7	39.0	77.8	118.5
Astro-H transfer from Helio	9.9	10.9	11.3	3.1	3.8	39.1
All other	-30.7	8.7	18.6	7.8	6.0	10.4

Astrophysics

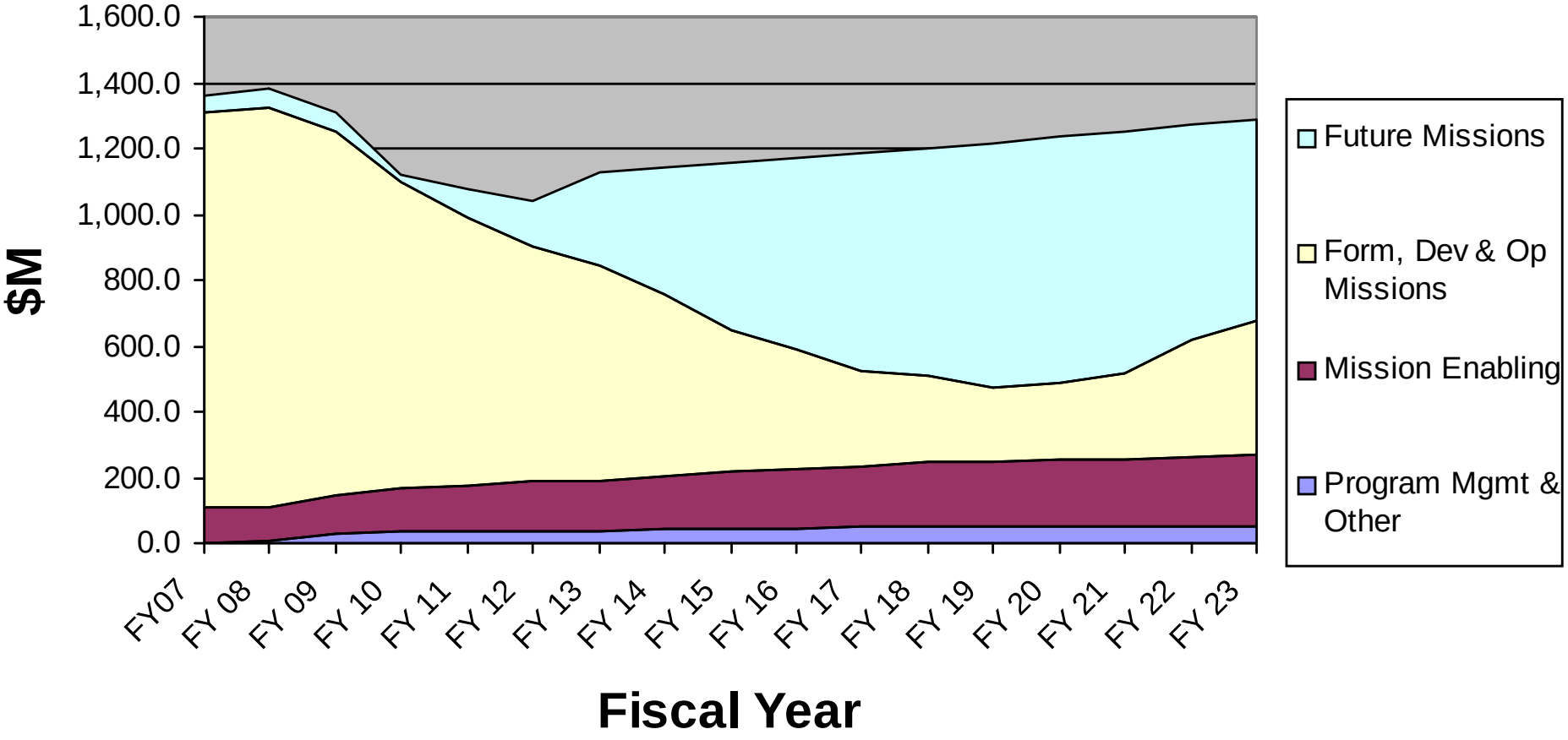
What changed:

- JWST completed PDR/NAR and has entered the development phase; reflects 70% confidence level for budget and schedule (LRD 6/2014).
- Kepler and Herschel/Planck experienced launch delays to March and May 2009 due to external circumstances; Kepler launched successfully March 6, and H/P launched successfully May 14.
- HST SM4 delayed until May 2009 in order to restore redundancy to science instrument command and data handling unit.
- SOFIA open door flight tests delayed to summer 2009 and initial science observations now early 2010.
- Operating missions Senior Review results incorporated: extend GALEX, Swift and Spitzer-warm; ramp down XMM support (future ADP funding available through ROSES, like RXTE); maintain RXTE operation at minimum level until 2010 senior review; terminate NASA support for GP-B.
- The JDEM and Exoplanet mission AOs are on hold pending results of the 2010 decadal survey.
- Supporting research & technology lines established in each science area (COR, PCOS, ExEP); these support named fellowships (Hubble, Einstein, Sagan fellows), strategic GO opportunities (e.g., CSA/MOST), and mid-TRL technology development.

What's the same:

- LISA, IXO (International X-ray Observatory, formerly Constellation-X and SIM/SIM Lite continue technology development pending results of 2010 decadal survey (JDEM now has the same posture).
- WISE LRD November 2009.
- NuSTAR LRD August 2011.
- Balloon flight opportunities continue at a rate of ~16-20 per year.
- R&A funding level.

Astrophysics FY2010 President's Budget and Estimates for 2011 - 2023



- Assumed operating missions beyond 2016 include JWST, SOFIA
- HST De-orbit mission development ramps up ~2020
- "Future Missions" wedge would be used for new mission initiatives, R&A/technology augmentations, extended missions, etc.
- The amount of "Future Missions" funding available between 2013 – 2020 is ~$4B