



Astrophysics Division Update

Presented to the

Astronomy and Astrophysics Advisory Committee (AAAC)

Dr. Jon Morse

Director, Astrophysics Division
Science Mission Directorate
NASA Headquarters
February 1, 2010



CY2009

2010

2011

2012

2013

Mission Launches etc.	<p>▼ Mar 6 Kepler</p> <p>▼ May 11 HST SM4</p> <p>▼ May 14 Herschel Planck</p> <p>▼ Dec 14 WISE</p>	<p>▼ Oct SOFIA Early Sci</p>		<p>▼ Jan NuSTAR</p>
Suborbital Rocket Program.	<p>▼ Feb CIBER 1</p> <p>▼ Jun DICE 1</p> <p>▼ Nov EXOS 1</p>	<p>▼ Feb CIBER 2</p> <p>▼ Feb FEB 1</p> <p>▼ Mar FURE 1</p> <p>▼ Apr PICTUR 1</p> <p>▼ May XQC4 1</p> <p>▼ May DICE 2</p> <p>▼ Jul FORTE 1</p> <p>▼ Oct DIORCE 3</p> <p>▼ Nov FUSP 2</p> <p>▼ Dec EXOS 2</p>	<p>▼ Jan MIRCOS 1</p> <p>▼ Jan MAGE 1</p> <p>▼ Feb FORTE 2</p> <p>▼ Mar ACCES 1</p> <p>▼ Sep EXOS 3</p> <p>▼ Sep ACCES 2</p>	<p>▼ Jan XACT 1</p> <p>▼ Mar EXOS 4</p> <p>▼ Mar ACES 3</p> <p>▼ Apr XQC 5</p> <p>▼ Sep XACT 2</p> <p>▼ Sep ACCES 4</p>
Balloon Campaigns	<p>Antarctica (CREAM, ANITA, superpressure dev) D/J</p> <p>Sweden (AESOP, LEE, superpressure dev) M/J</p> <p>Ft. Sumner (spr) (EBEX, NCT, FIREBall, CREST) A/M/J</p> <p>Palestine</p> <p>Ft. Sumner (fall) (PROTOEXIST, STO, HASP) S/O</p> <p>Australia</p>	<p>(CREAM V, SPB Test) N/D/J</p> <p>(TIGRE, NCT, HERO) M/A</p>		<p>(CREAM V, SPB Test) D/J</p> <p>(AESOP, LEE, superpressure dev) M/J</p> <p>(EBEX, NCT, FIREBall, CREST) A/M</p> <p>(PROTOEXIST, STO, HASP) S/O</p> <p>(TIGRE, NCT, HERO) M/A</p>
Opportunities		<p>Apr ▼ Sr Rev</p> <p>TBD ▼ Explorer AO</p>	<p>TBD ▼ JDEM AO</p> <p>TBD ▼ Exoplanet AO</p>	

Last Updated: January 28, 2010

Legend

Purple - Mission with International lead

Green - AOs pending Astro2010 Decadal Survey Report

* Student Opportunity balloon flight



HST
SM-4



White House Star Party: Oct 7



WISE

Dec 14 @ 6:09 AM PST from VAFB

2009: Year in Review

Herschel
& Planck



May 14 @ 9:12AM EDT from Kourou

SOFIA open door flight: Dec 18



Kepler

Mar 6 @ 10:48PM EDT from KSC

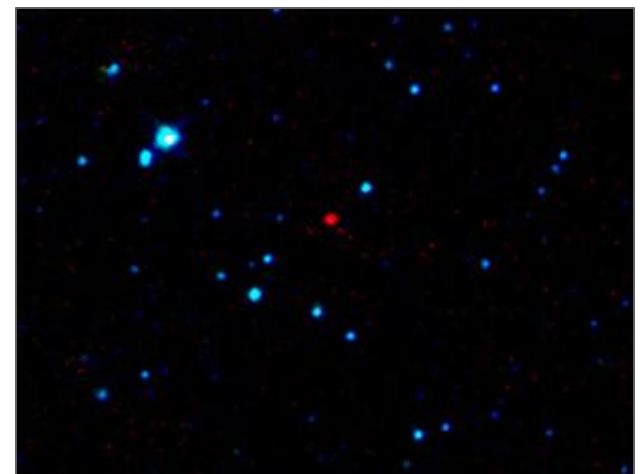
WISE Launches 12/14/2009



First Light Image in the constellation Carina @ 3.4, 4.6, 12 & 22 microns.

WISE launches from VAFB on a Delta II at 6:09 AM PST.

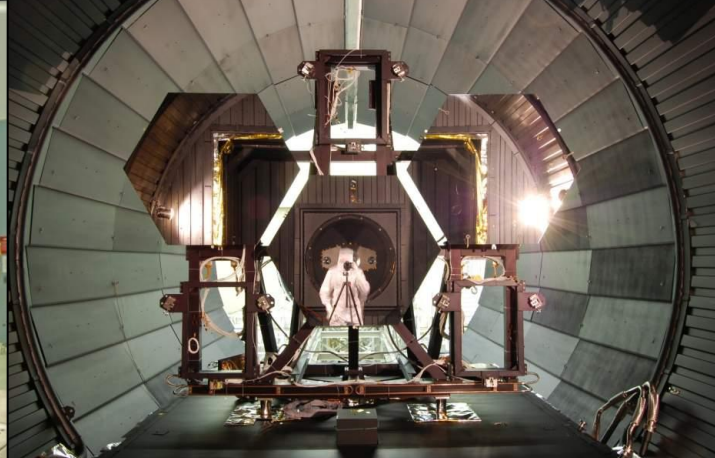
WISE commenced its 9-month sky survey on 1/14/2010



Red dot is a near-Earth asteroid.



12/18/09 – 100% Door Open, Nominal results
1/14/10 – FCF critical points completed, 5 hr flight
1/15/10 – Telescope Assembly Activation, 6 hr flight
1/29/10 – 10% Door Open Envelope Expansion
2/2/10 – Planned 40% Door Open Envelope expansion



Accomplishments and Significant Events



Recovering CREAM after flying nearly 3 circuits around Antarctica

Balloons

- CREAM (Cosmic Ray Energetics & Mass) mission ended on Jan 8 after more than 37 days aloft. Recovery ops underway.

NuSTAR

- Optics team completed the first seven layers of the flight optics.
- Spacecraft Structure Assembly Readiness Review was completed and assembly has commenced.

Astro-H

- Engineering Peer Reviews underway in preparation for March Instrument PDR.

Astrophysics – Operating Missions

Mission	Launch	End Date	Phase	-4	-3	-2	-1	This Month	Comments
Hubble	1990-04-24	2015	Ext	Y	G	G	G	G	SI C&DH lock-up events 10-22 & 11-3. Response plan now in place if occurs again.
RXTE	1995-12-30	2010-09-30	Ext	G	G	G	G	G	
Chandra	1999-07-23	2012-09-30	Ext	G	G	G	G	G	
XMM-Newton	1999-12-10	2010-09-30	Ext	G	G	G	G	G	
WMAP	2001-06-30	2012-09-30	Ext	G	G	G	G	G	
INTEGRAL	2002-10-17	2010-09-30	Ext	G	G	G	G	G	
GALEX	2003-04-28	2012-09-30	Ext	G	G	G	G	G	FUV detector off since May 29. Troubleshooting continuing. NUV detector remains nominal.
Spitzer	2003-08-25	2011-04-30	Ext	G	G	G	G	G	
Swift	2004-11-20	2012-09-30	Ext	G	G	G	G	G	ASI building second antenna which will be used to support Swift and NuSTAR.
Suzaku	2005-07-10	2011-09-30	Ext	G	G	G	G	G	
Fermi	2008-06-11	2013-08-18	Prime	G	G	G	G	G	
Kepler	2009-03-06	2012-11-15	Prime	Y	Y	G	G	G	Proj mgmt transitioned to Ames. CCD anomaly. If permanent, loss of 5% FOV.
Herschel	2009-05-14	2012-11-14	Prime	G	G	G	G	G	HIFI successfully turned on Jan 12. Herschel now has 3 (of 3) functioning instruments.
Planck	2009-05-14	2010-11-14	Prime	G	G	G	G	G	Completed 90% of first sky survey.

O:Overall



On plan, adequate Margin

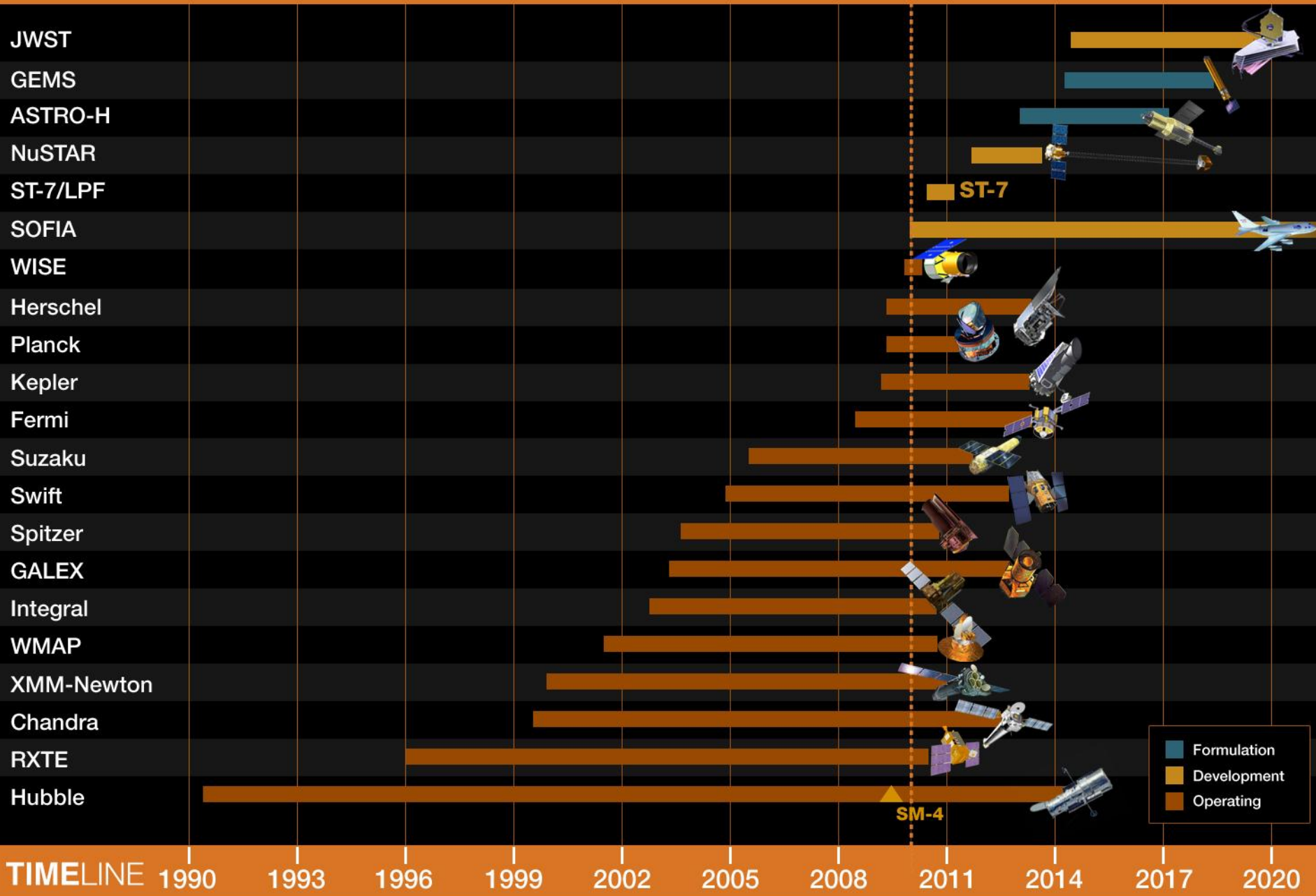


Problems, working to resolve within planned Margin



Problems, not enough margin to recover

Astrophysics Missions timeline



■ Formulation
■ Development
■ Operating

TIMELINE 1990 1993 1996 1999 2002 2005 2008 2011 2014 2017 2020

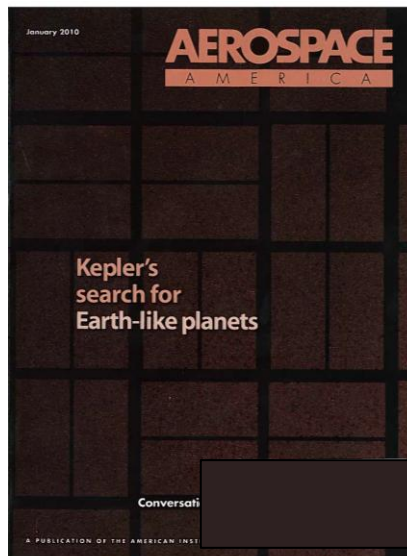
- Dec 02 – **Suzaku** - Spies Treasure Trove of Intergalactic Metal.
- Dec 08 – **Fermi** - Brightest Ever Blazar Flare. (3C 454.3)
- Dec 08 – **Hubble** - Deepest View of Universe Unveils Never-Before-Seen Galaxies.
- Dec 10 – **Chandra** - Galaxy Collision Switches on Black Hole.
- Dec 10 – **Suzaku** - Catches Retreat of a Black Hole's Disk.
- Dec 14 – **Hubble** - Proplyds in the Orion Nebula.
- Dec 15 – **Hubble** - Festive View of Grand Star-Forming Region.
- Dec 15 – **Hubble** - Smallest Kuiper Belt Object Ever Seen.
- Dec 16 – **Herschel** - Inside the Dark Heart of the Eagle.
- Dec 17 – **Chandra** - G292.0+1.8 & Kepler's Supernova Remnant.
- Dec 23 – **Hubble** - Vampires and Collisions Rejuvenate Stars
- Jan 04 – **Kepler** - Five new short-period transiting exoplanets discovered.
- Jan 04 – **Chandra** - NGC 1399: Massive Black Hole Implicated in Stellar Destruction
- Jan 05 – **Hubble** - Ultra Deep Field Infrared Survey.
- Jan 05 – **Chandra** - Sagittarius A*: Peering into the Heart of Darkness.
- Jan 05 – **Spitzer** - The Infrared Small Magellanic Cloud.
- Jan 05 – **Fermi** - Nature's Most Precise Clocks May Make "Galactic GPS" Possible.
- Jan 05 – **Spitzer** - Centuries-Old Star Mystery Coming to a Close.
- Jan 06 – **WISE** - Spies First Glimpse of the Starry Sky.
- Jan 14 – **Hubble** - Catches End of Star-Making Party in Nearby Dwarf Galaxy.
- Jan 21 – **Chandra** - ESO 137-001: Two Tails to Tell (Abell 3627).
- Jan 26 – **Swift** - Newborn Black Holes May Add Power to Exploding Stars.



WISE
Dec 2009 issue

Upcoming

- **Astronomy and Astrophysics Advisory Committee (AAAC) - February 1-2 in Arlington, VA.**
- **Astrophysics Subcommittee February 2-3.**
- NuSTAR - CDR February 2.
- 2010 Fellowships announced in February.
- Astro-H - U.S. PDR, March 9-10; Japanese PDR in April.
- JWST - Mission CDR, April 12-16 in Redondo Beach, CA.



Kepler
Jan 2010 issue



Fermi
Mar 2010 issue

Personnel Changes in Astrophysics

- **Linda Sparke** is new Lead for Astrophysics Research Program (October 2009).
- **Felicia Jones-Selden** is acting Deputy Director of Astrophysics Division (Rick Howard on detail to Office of Chief Engineer) Nov 2009 – May 2010.