The NASA HQ Perspective

Presented at the
Suzaku User Group

Dr. Lou Kaluzienski
Suzaku Program Scientist
Astrophysics Division
Science Mission Directorate
NASA Headquarters
September 21, 2009
The Herschel and Planck spacecraft launched on May 14, 2009, from the Guiana Space Centre in French Guiana. Image credit: ESA-CNES-Arianespace/Optique Vidéo du CSG
Accomplishments and Significant Events

WISE
- **Flight System arrived at VAFB on Aug 14.**
- Launch date of Dec 7 approved by VAFB.
- Project is on track to support launch date.

Hubble
- **Press conference Sept 9.**
- NICMOS successfully transitioned to operate mode on Aug 18. HST now has 5 working instruments.
- SMOV activities complete

Kepler
- **Press conference Aug 6.**
- Quality of light curves is very high, demonstrating capability to detect Earth-size planets.
### Astrophysics Program Content

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<th>FY10 President Submit</th>
<th>FY09</th>
<th>FY10</th>
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Astrophysics FY2010 President’s Budget Request

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. SM4 mission successfully completed.
• 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 Astro2010 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.
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<td>(EBEX, NCT, FIREBall, CREST)</td>
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<td>Exoplanet AO</td>
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**Legend**
- Purple - Mission with International lead
- * - Student Opportunity balloon flight

Last Updated: September 18, 2009
SMEX Selections

• Two Small Explorer (SMEX) missions downselected from six previously in study phase -- one in Astrophysics, one in Heliophysics:
  • Astrophysics SMEX: “The Gravity and Extreme Magnetism SMEX” (GEMS)
    • X-ray polarimetry of SMBH inner accretion disks (GR), magnetars, and supernova shock acceleration using a time projection chamber.
    • PI: Jean Swank, Goddard Space Flight Center.
    • Launch date 2014.
  • Astrophysics Mission of Opportunity investigation selected:
    • High Resolution Soft X-ray Spectrometer (SXS) for JAXA’s Astro-H
    • PI: Richard Kelly, Goddard Space Flight Center

• Upcoming call is planned for SPICA instrument concept studies (≤3) which could form the basis for future NASA/JAXA discussions. Contingent upon Decadal Survey recommendations and interagency agreement, a later AO would be issued for science investigations and flight hardware.
NOTE: Chart represent approximate dates for EX missions depending on budget, access to space, SMEX selection, which are subject to change
NRC Decadal Survey now well underway, Roger Blandford (Stanford U.) is Chair. Nearly 160 scientists involved.

- Five Science Frontiers Panels
- Four Program Prioritization Panels
- Six Infrastructure Study Groups

Eighteen Town Halls have taken place around the country.

- Nearly 600 community responses to Astro2010 solicitations.
- New science priorities for the next decade and beyond.
- Division is working diligently with the Survey to provide information and support mission inputs.
  - PPPs met during June 8-11
- Independent cost estimation should result in better estimates for medium and large strategic missions.

- Final Report targeted for release Summer 2010.
- http://www7.nationalacademies.org/bpa/BPA_049810
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.
• Assumed operating missions beyond 2016 include JWST, SOFIA; plus HST, Chandra, Fermi, etc. (e.g., Astro-H)
• HST De-orbit mission development ramps up ~2020
• “Future Missions” wedge is for strategic missions recommended by the Astro2010 decadal survey
• The amount of “Future Missions” funding available between 2013 – 2020 is ~$2.3B
Backup
Recent Press Releases (Typical Month)

Apr 28 – **Swift** - New GRB Smashes Cosmic Distance Record.
Apr 28 – **Spitzer/GALEX** - Multispectral Triangulum Galaxy (M33).
Apr 29 – **Chandra** - Galactic X-ray Ridge.
Apr 30 – **Hubble** - Starbursts in Dwarf Galaxies are a Global Affair.
Apr 30 – **Spitzer** - “Missing Link” Found (in M81).
Apr 30 – **Spitzer** - Why are Galaxies so Smooth? (NGC 2841).
May 4  – **Fermi** - Fermi Explores High-energy “Space Invaders”.
May 7  – **Hubble** - Refined Hubble Constant Narrows Possible Explanations for Dark Energy.
May 10 – **Hubble** - Hubble Photographs a Planetary Nebula to Commemorate Decommissioning of Super Camera.
May 13 – **Kepler** - Begins its Search for Other Earth-like Planets.
May 13 – **Spitzer** - Seeing Crystals form Around a Young Star.
May 14 – **Chandra** - 3C305: An Intriguing Glowing Galaxy.
May 14 – **Herschel/Planck** - Launch, On Way to Study our Cosmic Origins.
May 15 – **Spitzer** – Cryogens exhausted; transition to Warm Mission begins.
Senior Review 2008 Rankings

Operating Missions

Archives

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<tr>
<th>Mission</th>
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<th>HEASARC/LAMBDA</th>
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<th>NED</th>
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Accomplishments and Significant Events

Hubble Development (SM-4)

✓ Launched – May 11 at 2:02 PM.
✓ Rate Sensor Units – replaced
✓ WFC3 – installed
✓ SI C&DH – installed
✓ COS – installed
✓ New batteries – installed
✓ ACS – wide field channel repaired
✓ STIS – repaired
✓ Fine Guidance Sensor – replaced
✓ New Outer Blankets 5, 7 & 8 – replaced
✓ Soft Capture Mechanism – installed

Reboost – not required
* Projections based on budget projections and missions currently in development
Fellowships aligned with Astrophysics Division Science Themes.

- Solicit proposals with Physics of the Cosmos, Exoplanet Exploration, or Cosmic Origins science as focus rather than mission specific.

- Management by existing fellowship organizations.
  - *Sagan* fellows: Exoplanet Exploration program office, JPL
  - *Einstein* fellows: Chandra X-ray Center
  - *Hubble* fellows: STScI

- Stipend (all new fellows): $60,500.

- Identical Deadline for Applications: (most recent round).
  - Einstein Fellows: 156 applicants, 10 selections.
  - Sagan Fellows: 51 applicants, 5 selections.
  - Hubble Fellows: 237 applicants, 17 selections.

- For more information see:
  - Sagan: [http://nexsci.caltech.edu/sagan/fellowship.shtml](http://nexsci.caltech.edu/sagan/fellowship.shtml)
  - Einstein: [http://cxc.harvard.edu/fellows/](http://cxc.harvard.edu/fellows/)
Other Astrophysics Division News

• WISE
  - S/C thermal vacuum test completed with no major issues.
  - Payload integrated to S/C and environ testing complete.
  - Ready to support Launch Readiness Date of 11-1-09 from Vandenberg AFB, though manifested 12-10-09.

• SOFIA
  - Nighttime telescope line operations to test operations and tracking of stars; Cavity Door Drive System installed.
  - Reviews ongoing in preparation for open door flight tests.
  - 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).
  - First mirror segment completed cryo testing.
  - ISIM approved for full-scale implementation (CDR March 12, 2009).

• Spitzer
  - Cryogens exhausted May 15; beginning warm operations

• Personnel Changes
  - Doug Hudgins was hired as the Exoplanet Exploration Program Scientist (May 2009).
Proposed Astrophysics Organization

Astrophysics Division
Director
Deputy Director

Exoplanet Exploration
Operating:
- Keck Int.
- Kepler (Phase E)
In formulation or development:
- SIM
- TPF
- LBTI

Cosmic Origins
Operating:
- HST
- Spitzer
- Herschel (Phase E)
In formulation or development:
- JWST
SOFIA Program

Physics of the Cosmos
Operating:
- Chandra
- XMM-Newton
- Planck (Phase E)
- Fermi (Phase E)
In formulation or development:
- IXO
- LISA
- JDEM

Astrophysics Explorers
Operating:
- Swift
- WMAP
- RXTE
- GALEX
- Others
In formulation or development:
- WISE
- NuSTAR

Astrophysics Research
- Sub-orbital payloads
- Balloon program
- Grants programs
- Some MO&DA
- Data archives
- APRA
- Other

Administrative Support

ISSC In Development:
- Herschel and Planck

Operating:
- HST
- Spitzer
- Herschel (Phase E)
In formulation or development:
- JWST
SOFIA Program

Operating:
- Chandra
- XMM-Newton
- Planck (Phase E)
- Fermi (Phase E)
In formulation or development:
- IXO
- LISA
- JDEM

Operating:
- Swift
- WMAP
- RXTE
- GALEX
- Others
In formulation or development:
- WISE
- NuSTAR

ISSC In Development:
- Herschel and Planck

Operating:
- HST
- Spitzer
- Herschel (Phase E)
In formulation or development:
- JWST
SOFIA Program

Operating:
- Chandra
- XMM-Newton
- Planck (Phase E)
- Fermi (Phase E)
In formulation or development:
- IXO
- LISA
- JDEM

Operating:
- Swift
- WMAP
- RXTE
- GALEX
- Others
In formulation or development:
- WISE
- NuSTAR

ISSC In Development:
- Herschel and Planck
# Astrophysics Division - Science Mission Directorate

**Director**

Jon Morse

**Deputy Director**

Rick Howard

---

**Lead Secretary:** Kelly Johnson  
**Secretary:** Lydia Thompson  
**Program Support Specialist:** Sheila Gorham

---

**Asst Dir for Innovation & Technology:** Michael Moore (acting)  
**Division PAO POC:** Ilana Harrus *  
**Division E/PO POC:** Hashima Hasan  
**Information Manager:** Lisa Wainio *

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**Resource Management**

- Holly Degen +  
- David Darbouze +

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### Programs/Missions

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<th>Program Executive</th>
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**Research and Data Analysis**

* Division R&A Lead: Wilt Sanders *

- Astrobiology: Doug Hudgins  
- Astrophysics Data Analysis: Doug Hudgins  
- Astrophysics Theory: Thierry Lanz *  
  - Michael Salamon  
  - Vernon Jones  
- Cosmic Ray: Ilana Harrus *  
- Gamma Ray/X-ray: Ilana Harrus *  
  - Lou Kaluzienski  
  - Wilt Sanders *  
- IR/Submillimeter/Radio: Eric Smith  
  - Doug Hudgins  
  - Wilt Sanders *  
- Optical/Infrared: Mario Perez *  
  - Hashima Hasan  
  - Padi Boyd *  
- ADCAR/Archives: Thierry Lanz *  
  - Balloons: Vernon Jones (PS), Mark Sistilli (PE)

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* Members of the Mgmt & Policy Division  
# Member of the SMD Front Office  
* Detailee, IPA, or contractor

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**Physics of the Cosmos (PCOS)**

- **LEADS:** Michael Salamon  
  - Chandra  
    - Wilt Sanders *  
    - Jaya Bajpayee *  
  - IXO  
    - Wilt Sanders *  
    - Michael Moore  
  - Fermi  
    - Ilana Harrus *  
    - Jaya Bajpayee *  
  - Integral  
    - Wilt Sanders *  
    - Jaya Bajpayee *  
  - JDEM  
    - Richard Griffiths *  
    - Ray Taylor  
  - LISA  
    - Michael Salamon  
    - Anne-Marie Novo-Gradac  
  - Planck  
    - Michael Salamon  
    - Jaya Bajpayee  
  - Suzaku  
    - Lou Kaluzienski  
    - Jaya Bajpayee  
  - XMM-Newton  
    - Lou Kaluzienski  
    - Jaya Bajpayee  

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**Astrophysics Explorers (APEX)**

- **LEADS: Wilt Sanders *  
  - Swift  
    - Ilana Harrus *  
    - Jaya Bajpayee *  
  - WMAP  
    - Michael Salamon  
    - Jaya Bajpayee *  
  - RXTE  
    - Ilana Harrus *  
    - Jaya Bajpayee *  
  - GALEX  
    - Padi Boyd *  
    - Jaya Bajpayee *  
  - WISE  
    - Hashima Hasan  
    - Anne-Marie Novo-Gradac  
  - NuSTAR  
    - Lou Kaluzienski  
    - Mark Sistilli  
  - Astro-H  
    - Lou Kaluzienski  
    - Anne-Marie Novo-Gradac  
  - GEMS  
    - Hashima Hasan  
    - Lia LaPiana

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**Lead Secretary:** Kelly Johnson  
**Secretary:** Lydia Thompson  
**Program Support Specialist:** Sheila Gorham

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**Asst Dir for Innovation & Technology:** Michael Moore (acting)

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**Division PAO POC:** Ilana Harrus *

**Division E/PO POC:** Hashima Hasan

**Information Manager:** Lisa Wainio *

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