Welcome New Members

- Jamie Bock  Jet Propulsion Laboratory
- Scott Gaudi  Ohio State University
- Gary Melnick  Harvard University
- John Nousek  Pennsylvania State University
- Brad Peterson (Chair)  Ohio State University
- Karl Stapelfeldt  NASA Goddard Space Flight Center

Topics not covered in this talk, or covered lightly, (because they have their own presentations later in this meeting)
- JWST
- WFIRST
- R&A
- NuSTAR
- New Telescope Hardware from NRO
- Explorers
NuSTAR Launched
June 13, 2012

Arriving at Kwajalein Atoll

NuSTAR dropped from Stargazer
NuSTAR Launched
June 13, 2012

- NuSTAR uses the first focusing telescopes to image the sky hard X-rays (6 - 79 keV) (previous missions used coded apertures).
- During a two-year primary mission phase, NuSTAR will:
  - Take a census of collapsed stars and black holes of different sizes by surveying regions surrounding the center of the Milky Way Galaxy and performing deep observations of the extragalactic sky;
  - Map recently-synthesized material in young supernova remnants to understand how stars explode and how elements are created; and
  - Understand what powers relativistic jets of particles from the most extreme active galaxies hosting supermassive black holes.
- NuSTAR has two co-aligned grazing incidence telescopes with multi-coated optics and innovative hard X-ray detectors.
- NuSTAR deploys an extendable mast to achieve a 10-meter focal length.
- NuSTAR improves sensitivity, spatial, and spectral resolution by factors of 10 to previous hard X-ray missions.
Kepler Discovers Planetary Odd Couple

Kepler-36, G subgiant (G1IV), 1200 ly in Cygnus
Kepler-36b, hot super Earth, rocky planet with iron core
Kepler-36c, hot mini-Neptune with rocky core and low density

At closest approach every 97 days, separation less than 5 x Earth-Moon distance, significant tidal forces
• Using images of M31 taken with ACS and WFC3 over a period of 5-7 years, HST has measured tangential motion of M31 to be very small (~.04 milli-arcseconds/year).

• Measuring the tangential motion of an object at 2.5 million light years is a significant accomplishment.

• Extrapolating the now completely known motion of M31 (and M33), the future of the Andromeda galaxy – Milky Way system can be simulated: the two galaxies will collide and merge in 4 billion years.
Fermi Detects Highest-Energy Light from a Solar Flare

(UL) Fermi all sky map above 100 MeV on March 7, 2012.
(LL) Extreme UV flash of X5.4 solar flare on March 7, 2012, from SDO.
(LR) SDO image showing two ribbons of the solar flare from active region 11429.
• Caltech is operating GALEX with private funds and may continue the science mission for as long as three years (extendable).
  - Caltech currently has funds for 5 months of operations from Keck Institute, Weizmann Institute, Cornell University, International consortium (GAMA/Herschel-Atlas/DINGO).
  - No change in data access for the community collected during the Caltech mission: all data will continue to be made publicly available after a 12 month period of exclusivity.

• A Space Act Agreement was signed on May 15, 2012 between NASA and Caltech which loans the spacecraft to Caltech.

• NASA holds long term liability and is responsible for decommissioning and re-entry.
The NASA Science Mission Directorate Program Management Council met on May 10, 2012 and evaluated the GEMS Key Decision Point C (Confirmation Review).

Based on this review and the project’s readiness documents, the Decision Authority for the GEMS project has non-confirmed the GEMS project to enter implementation, thereby terminating the mission.

The primary rationale for non-confirmation is as follows:

• Unacceptable cost, schedule, and technical risk of an AO-selected, cost capped mission.
  - After evaluating available cost models and the Standing Review Board (SRB) cost and technical risk assessment, the Science Mission Directorate (SMD) Program Management Council (DPMC) concluded that the GEMS Project was not executable at the Project’s requested funding level.
  - SRB assessment was that the most significant cost risks are: the XPI instrument, Optical Boom integration complexity, and mission avionics unit lack of maturity.
  - Independent (SRB and Aerospace) 50% confidence cost estimates driven by these risks are more than 25% over the AO-set PI cost cap at which the Project was proposed and selected. (AO-set cost cap was $119M and later adjusted to $121M) GSFC Management-proposed cost commitment is more than 20% over the AO-set cost cap. NOTE: AO-set PI cost cap does not include the Launch vehicle.
  - GEMS turned out to be a greater technical challenge than originally anticipated.
• Significant descopes were taken during formulation to improve mass, power, cost, and schedule margins.
  - Remaining descopes yield relatively small savings and/or have risk impact.
• NASA is conducting an independent review of SMD’s decision process to non-confirm GEMS. Report will be provided to Congress.

• Under Public Law 112-55, NASA is required to provide Congress with 15 days notification before a project is terminated and the funds are reallocated.

• Until the report is provided to Congress and the notification process is completed, the GEMS project continues.

• Funding planned for GEMS will go back to the Future Explorer budget to enable robust selections from the Explorer 2011 AO and to enable acceleration of future Explorer AOs.
The SOFIA Second Generation Instrument selection was announced on April 17, 2012. The selected proposals were judged to have the best science value and feasible development plans.

- **The High-resolution Airborne Wideband Camera Polarization (HAWC-Pol)**, Charles Dowell, JPL. Upgrades the HAWC instrument to include the capability to make polarimetric observations at far-infrared wavelengths.

- **HAWC++**, Johannes Staguhn, Johns Hopkins University. Provides a sensitive, large-format detector array to the HAWC-Pol investigation, increasing its observing efficiency.

- Upgraded HAWC will deliver second generation capabilities on a first generation schedule – no delay in HAWC commissioning.

- Next SOFIA instrument AO in 2014.
SOFIA Development and Science

**SOFIA**

- Segment 3 aircraft work is nearly complete.
  - Avionics modernization engineering and wiring complete.
  - Line Operations completed to verify updated telescope software. Verified that most telescope operational issues seen during early science have likely been resolved, further line ops continue.
  - Expect full ops capability by next summer with the availability of four instruments to GOs.

- Early Science successful
  - Twenty-two papers published in special edition of *Astronomy and Astrophysics* on GREAT results.

- Cycle 1 peer review completed; selection announcement planned for August.
  - Expect to provide 200 flight hours to GOs in Cycle 1.
  - First Southern Hemisphere deployment will occur during Cycle 1 in July 2013.
SOFIA Cockpit Modification

July 2012
Astro-H

• EM instrument suffered a failure in one heat switch. Team working to determine how much of planned performance testing in Japan can be conducted with failed heat switch.


• Final NASA EM components were hand-carried to Japan July 21 for a July 26 installation into the JAXA EM dewar.

• The engineering model (EM) Calorimeter Spectrometer Insert (CSI) to begin cryo functional test Aug 7, 2012.

• Flight hardware fabrication proceeding well.

• Launch date continues to be under review by JAXA; NASA is prepared to support launch date change.
Euclid – NASA Contribution

- NASA's contribution to ESA's Euclid mission will be the Near Infrared Spectrograph and Photometer (NISP) flight subassemblies (detector + ASIC+ cryo-cable = ‘triplet’) that meet ESA's requirements for testing and characterization.
  - This contribution will include manufacture of the flight subassemblies by Teledyne followed by characterization and testing of the flight subassemblies by NASA.
  - After delivery, ESA will be responsible for integrating the subassemblies into the NISP focal plane. ESA will be responsible for solving any problems that arise.
- NASA risk for cost overrun is low.
  - ESA has agreed to not have any flight requirements for the triplets that are not already demonstrated by the prototype triplets developed by ESA. This lowers cost risk for the flight triplets.
  - The cost of characterization and testing is reduced through bringing that work in-house at NASA.
  - The cost risk of problems during I&T is minimized by ending NASA’s obligations at delivery of the characterized and tested subassemblies.
- This division of responsibilities is the same as NASA and ESA agreed for Planck.
• ESA will appoint a NASA-selected member to the Euclid Science Team.

• The Euclid Consortium (EC) will appoint a NASA-selected member to the Euclid Consortium Board and up to 40 NASA-selected members to the Euclid Consortium, commensurate with NASA's hardware contribution to the mission.

• NASA-appointed EC members will have the same data rights as European EC members and will be fully integrated into the Science Working Groups of the EC. The roles and responsibilities of the NASA-appointed EC members will be consistent with ESA’s Euclid Science Management Plan and with the Euclid Consortium Science Policies.

• Solicitation for NASA-selected members issued May 23, 2012 as a ROSES-12 amendment; proposals due August 15, 2012.

• MOU agreed to by NASA and ESA, in approval process on both sides, will be signed after after the full ESA Council meeting scheduled in December 2012.
WFIRST

• Astro2010 recommended WFIRST as the highest priority large mission.
  - The President’s FY13 NASA budget request includes no new large missions; Astrophysics expects none before JWST is successfully completed.
  - FY13 budget request does not support originally planned WFIRST technology development and includes no funding identified for WFIRST.
  - WFIRST will not launch in this decade (2018 + 7 yrs = 2025).
  - Astrophysics does not anticipate budget growth in the foreseeable future.

• Science Definition Team (SDT) will deliver its final report in August 2012.
  - The first Design Reference Mission (DRM1) is a proof of concept that a mission can be constructed that is compliant with the Astro2010 recommendation. Second Design Reference Mission (DRM2) will not duplicate capabilities of Euclid, LSST, and JWST in advancing science objectives of WFIRST. Look for cost savings.
  - SDT report shows that (a) DRM1 is fully responsive to the objectives of Astro2010 and (b) DRM2 offers a low-cost near-IR survey opportunity, but the limited 3-year life precludes full compliance with Astro2010 goals.
  - An independent cost and technical assessment of DRM2 is underway.

• NASA is proceeding as follows:
  - Through the SDT’s DRMs, established a basis for WFIRST planning.
  - Partner on ESA’s Euclid to advance some of the science of Astro2010 and WFIRST.
  - Advance the technology and planning required for WFIRST as the budget allows.
  - Contemplate follow-on trade studies to the SDT’s Design Reference Missions.
Explorer Program

- FY13 budget request does not support an AO for both missions and missions of opportunity (MOs) in late CY12.
  - First priority in the Explorer program is to complete Explorers in development: NuSTAR, SXS/Astro-H.
  - Second priority is to downselect and fund the development of one mission and one MO from the projects currently conducting Phase A studies (FINESSE/TESS, GUSSTO/NICER).
  - Third priority is to issue new AOs leading to the development of new missions.
- Funding planned for GEMS will remain in the Explorer Program.
  - Immediately begin the new projects when they are downselected in Spring 2013.
  - Advance the next mission AO.
- The Astro2010 Decadal Survey said to “Enable rapid response to science opportunities; augments current plan by 2 MIDEXs, 2 SMEXs, and 4 MoOs.” Astrophysics Division is planning a series of AOs (subject to budget approval):
  - An AO for a SMEX in late-2013 with the cost caps and dates TBD by fall 2012.
  - An AO for an EX and MO in 2015.
## 2012 Senior Review Results

<table>
<thead>
<tr>
<th>Mission</th>
<th>Result</th>
</tr>
</thead>
</table>
| Chandra  | - Fully fund as budgeted thru FY16  
           - Augment Guest Observer Program at ½ Project request                                                                               |
| Fermi    | - Mission extension thru FY16  
           - Reduced budget starting in FY14                                                                                                   |
| Hubble   | - Fully fund as budgeted                                                                                                               |
| Kepler   | - Extend mission operations thru FY16  
           - Augment Guest Observer and Participating Science Program at 1/2 Project request                                                      |
| Planck   | - Fund US Support of 1-year extension of Low Frequency Instrument operations                                                            |
| Spitzer  | - Extend ops thru FY14  
           - Closeout in FY15                                                                                                                     |
| Suzaku   | - Extend US Science support through March 2015 (Astro-H launch +1 year)                                                                    |
| Swift    | - Extend mission operations thru FY16  
           - Augment Guest Observer Program per Project request                                                                                   |
| XMM-Newton | - Extend US support through March 2015                                                                                                         |

Note: All FY15 and FY16 decisions will be revisited in the 2014 Senior Review.

- Attendance from all large, and many small, astrophysics SOCs
- Charter included:
  - Reports on process and what works well or not and why
  - Issues with Astrophysics science policy issues and suggestions for improvements
- Report has 38 findings in 7 topic areas.
- Selected findings:
  - An active research staff is an essential component of an astronomy center in all phases of a mission.
  - Missions should develop a model that illustrates the impact of reduced resources in terms of reduced scientific productivity.
  - All observing time should be allocated through well-defined, verifiable processes. Peer review should be used wherever possible.
  - Consensus favored funding levels set through a formula, although the potential advantages of budget review by committee were also noted.
  - NASA should explore additional options for enabling scientists employed at its centers to participate in reviews, user committees and working groups.
- Report and presentations at http://www.stsci.edu/~inr/portals.html
# Astrophysics - Missions in Formulation & Implementation

<table>
<thead>
<tr>
<th>Project</th>
<th>Overall previous months</th>
<th>This Month</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>-4</td>
<td>-3</td>
<td>-2</td>
</tr>
<tr>
<td>Physics of the Cosmos</td>
<td>G</td>
<td>G</td>
<td>G</td>
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<tr>
<td>ST-7 (NET Apr 2014)</td>
<td>G</td>
<td>G</td>
<td>G</td>
</tr>
<tr>
<td>Explorer Program</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NuSTAR (Jun 13, 2012)</td>
<td>Y</td>
<td>Y</td>
<td>G</td>
</tr>
<tr>
<td>Astro-H (Aug 2014)</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>GEMS (Nov 2014)</td>
<td>G/</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>FINESSE, TESS, NICER, GUSSTO</td>
<td>G</td>
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<tr>
<td>Cosmic Origins</td>
<td>G</td>
<td>G</td>
<td>G</td>
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<tr>
<td>SOFIA (ongoing)</td>
<td>G/</td>
<td>Y</td>
<td>Y</td>
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<tr>
<td>Exoplanet Exploration</td>
<td>G</td>
<td>G</td>
<td>G</td>
</tr>
<tr>
<td>Balloon Prog (ongoing)</td>
<td>G</td>
<td>G</td>
<td>G</td>
</tr>
</tbody>
</table>

O: Overall,  C: Cost,  S: Schedule,  T: Technical,  P: Programmatic

- **G**: On plan, adequate margin
- **Y**: Problems, working to resolve within planned margin
- **R**: Problems, not enough margin to recover


No update on JAXA LRD. Heat switch failure in EM instrument.

Project non-confirmed.

Phase A reports due Sept 21, 2012.

Conducting system-level line operations tests.

Superpressure balloon test flight in Sweden waiting for suitable weather.
# Astrophysics – Operating Missions

<table>
<thead>
<tr>
<th>Mission</th>
<th>Launch</th>
<th>End Date</th>
<th>Phase</th>
<th>-4</th>
<th>-3</th>
<th>-2</th>
<th>-1</th>
<th>June</th>
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<tbody>
<tr>
<td>Hubble</td>
<td>1990-04-24</td>
<td>2016-09-30</td>
<td>Prime</td>
<td>G</td>
<td>G</td>
<td>G</td>
<td>G</td>
<td>G</td>
</tr>
<tr>
<td>Chandra</td>
<td>1999-07-23</td>
<td>2016-09-30</td>
<td>Ext</td>
<td>G</td>
<td>G</td>
<td>G</td>
<td>G</td>
<td>G</td>
</tr>
<tr>
<td>XMM-Newton</td>
<td>1999-12-10</td>
<td>2015-03-31</td>
<td>Ext</td>
<td>G</td>
<td>G</td>
<td>G</td>
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</tr>
<tr>
<td>GALEX</td>
<td>2003-04-28</td>
<td>2012-02-07</td>
<td>Ext</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td></td>
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</tr>
<tr>
<td>Spitzer</td>
<td>2003-08-25</td>
<td>2014-09-30</td>
<td>Ext</td>
<td>G</td>
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</tr>
<tr>
<td>Swift</td>
<td>2004-11-20</td>
<td>2016-09-30</td>
<td>Ext</td>
<td>G</td>
<td>G</td>
<td>G</td>
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</tr>
<tr>
<td>Suzaku</td>
<td>2005-07-10</td>
<td>2015-03-31</td>
<td>Ext</td>
<td>G</td>
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<td>G</td>
<td>G</td>
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</tr>
<tr>
<td>Fermi</td>
<td>2008-06-11</td>
<td>2016-09-30</td>
<td>Prime</td>
<td>G</td>
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</tr>
<tr>
<td>Kepler</td>
<td>2009-03-07</td>
<td>2016-09-30</td>
<td>Prime</td>
<td>G</td>
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<td>G</td>
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<tr>
<td>Herschel</td>
<td>2009-05-14</td>
<td>2013-05-14</td>
<td>Prime</td>
<td>G</td>
<td>G</td>
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<td>G</td>
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<tr>
<td>Planck</td>
<td>2009-05-14</td>
<td>2013-01-31</td>
<td>Ext</td>
<td>G</td>
<td>G</td>
<td>G</td>
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</tr>
</tbody>
</table>

**Comments:***

- COS back in nominal operation at new lifetime position of detector. 20% of planned Venus Transit data acquired.
- Space Act Agreement signed on May 14, 2012. GALEX on loan to Caltech for 3 years.
- Failure of reaction wheel #2. Spacecraft back in operational mode with 3 reaction wheels.
- SPC approved another 6 month extension to warm LFI operations.
# Astrophysics Mission Events

## Mission Launches etc.

<table>
<thead>
<tr>
<th>CY2012</th>
<th>2013</th>
<th>2014</th>
<th>Last Updated: July 20, 2012</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Suborbital Rocket Program.</strong></td>
<td><strong>Jun 13 NuSTAR</strong></td>
<td><strong>Spring Explorer Downselect</strong></td>
<td><strong>Ship Flt CSI to JAXA Astro-H</strong></td>
</tr>
<tr>
<td><strong>Ft. Sumner (spr)</strong></td>
<td><strong>Ft. Sumner (fall)</strong></td>
<td><strong>Palestine</strong></td>
<td><strong>Australia</strong></td>
</tr>
<tr>
<td><strong>Antarctica</strong></td>
<td><strong>Sweden</strong></td>
<td><strong>Ft. Sumner (fall)</strong></td>
<td><strong>New Zealand</strong></td>
</tr>
</tbody>
</table>

## Balloon Campaigns

- **Antarctica (STO, CREST)**: (Superpressure)
- **New Zealand (under review)**: (No astrophysics flights)

## Opportunities

- **Sept/Oct MoO AO**
- **Late SMEX AO**
Personnel Changes

• SMD
  – Colleen Hartman has moved to GSFC as Deputy Director for Science, Operations, and Program Performance
  – Marc Allen is the SMD Deputy AA for Research (Acting)
  – Planetary Science Division Deputy will be filled on an acting basis by a rotation; July’s Acting DDD is Lindley Johnson

• Astrophysics Division
  – Deputy Division Director advertisement closed in April. Process is advanced toward naming new DDD within weeks.
  – Departures:
    • Kelly Johnson – start 1 year detail in Office of Chief Technologist (Jul 23)
    • Mario Perez – end of IPA (Aug 31)
    • Chris Davis – taking a new job (Sep 7)
    • Jaya Bajpayee – end of detail from GSFC (Sept 31)
    • Rita Sambruna – start 1 year detail in Office of Administrator (Oct 1)
  – Arrivals
    • Larry Petro – start IPA (Jul 1)
    • Mike Garcia – start IPA (Aug 1)
    • Keith McGregor – start IPA (mid-August)
Astrophysics Division Organization Chart

**Resource Management**
- Holly Degen +
- Peifen Anawalt +
- Lead Secretary: Leslie Allen (acting)
- Secretary: Leslie Allen
- Program Support Specialist: Sheila Gorham
- Asst Dir for Innovation & Technology: Michael Moore (acting)
- PE for Tech & Ops Missions: William (Billy) Lightsey *

**Communications**
- Division E/PO POC: Hashima Hasan (Lead)
- Division PAO POC: Ilana Harrus *
- Information Manager: Lisa Wainio *

**Astrophysics Research**
- Program Manager: Linda Sparke
- Astrophysics Data Analysis: Doug Hudgins
- Astrophysics Theory: Linda Sparke
- Origins of Solar Systems: Mario Perez *
- APRA lead: Ilana Harrus *
- Cosmic Rays, Fundamental Physics: Vernon Jones
- Gamma Ray/X-ray: Ilana Harrus *, Wilt Sanders *
- Lou Kaluzienski, Mike Garcia *
- Optical/Ultraviolet: Mario Perez *
- Hashima Hasan, Larry Petro *
- IR/Submillimeter/Radio: Chris Davis *, Doug Hudgins
- Glenn Wahlgren *
- Lab Astro: Glenn Wahlgren *
- ADCAR Archives: Hashima Hasan
- Astrophysics POC for Sounding rockets: Wilt Sanders *
- Balloons Program: Vernon Jones (PS), Mark Sistilli (PE)

**Programs / Missions**

**Exoplanet Exploration (EXEP)**
- LEADS: Doug Hudgins
- Keck: Mario Perez *
- Kepler: Doug Hudgins
- LBTI: Mario Perez *
- NExScI: Mario Perez *
- Program Scientist: Lia LaPiana
- Program Executive: Mario Perez *

**Cosmic Origins (COR)**
- LEADS: Mario Perez *
- Herschel: Glenn Wahlgren *
- Hubble: Richard Griffiths *
- JWST: Hashima Hasan
- SOFIA: Chris Davis *
- Spitzer: Glenn Wahlgren *
- Program Scientist: John Gagosian (acting)
- Program Executive: Jaya Bajpayee *

**Physics of the Cosmos (PCOS)**
- LEADS: Rita Sambruna
- Chandra: Wilt Sanders *
- Euclid: Richard Griffiths *
- Fermi: Ilana Harrus *
- Planck: Rita Sambruna
- ST-7/LPF: Wilt Sanders *
- XMM-Newton: Lou Kaluzienski
- Program Scientist: Jaya Bajpayee *
- Program Executive: Anne-Marie Novo-Gradac

**Astrophysics Explorers (APEX)**
- LEADS: Wilt Sanders *
- Astro-H: Lou Kaluzienski
- GALEX: Mario Perez *
- GEMS: Richard Griffiths *
- NuSTAR: Lou Kaluzienski
- RXTE: Ilana Harrus *
- Suzaku: Lou Kaluzienski
- Swift: Ilana Harrus *
- WISE: Hashima Hasan
- WMAP: Rita Sambruna
- Program Scientist: Anne-Marie Novo-Gradac
- Program Executive: Jaya Bajpayee *

* Detailee, IPA, or contractor
+ Member of the Resources Mgmt Division

Departed: Bill Danchi, Tina Swindell, Raymond Kinzer Jr.
Kelly Johnson on detail until August 2012.

JWST now part of the JWST Program Office.
FY2011 Astrophysics Budget by Function

FY11 Astrophysics Budget

- Total $608M
- Individual awards ~27%
  (R&A, SAT, GO, Fellows)
- Development missions (26%)
- SR&T/other (9%)
- Operating missions (45%)
- Research (20%)
- Fellows (2%)
- GO Programs (11%)
Astrophysics Budget Strategy

• Use the scientific priorities of the Astro2010 Decadal Survey to guide strategy
  – Due to budget constraints, no new missions other than Explorers can enter formulation before FY17.

• In the absence of new missions, progress against decadal priorities is maintained through the core research program, through continued operation of existing missions and their GO programs, through the suborbital programs, and through frequent Explorer opportunities.

• In order to prepare for a new mission starting in FY17, a near term program of mission concept studies and technology development will be undertaken, with the goal of making a mid-decade decision on which mission(s) will begin formulation starting in FY17
  – Currently there are no new starts for large missions. Moderate missions (“probes”) must be considered for start in FY17, possibly in addition to a large mission (e.g., WFIRST).

• New strategic missions in the future are possible only if the Astrophysics budget recovers a large portion of the SMD funds freed up as the JWST budget begins to decrease in FY18 and out.
**Astrophysics Budget Strategy**

2012
- Study WFIRST options.
- Solicit ideas from the community for studies of moderate missions that address DS priorities.
  - Establish community study teams for mission concepts.
  - Initiate mission concept studies within the programs.
  - Use community analysis groups to inform process.

2013
- Use competed and directed technology programs to develop enabling technology and mission concepts.

2014
- Continue from 2013.

2015
- Using community input, conduct prioritization and decision process for identifying FY17 new start.
  - Start pre-formulation for new FY17 strategic mission.
  - Start NRC mid-decade review.

2016
- Complete mid-decade review. Revise plans as necessary in response to report.

2017
- New start for strategic mission.
Astrophysics Budget Strategy

• A white paper describing the response to the Decadal Survey recommendations, consistent with current budget guidance, is under development.
  – Will review with Committee on Astronomy and Astrophysics and Astrophysics Subcommittee in the Fall.
  – Will release to the community before Long Beach AAS meeting.

• Will outline calls and studies planned to prepare for:
  – Decision to start a new strategic mission after JWST (and possibly a second mission, depending on out year budget guidance).
  – Mid-decade review.
  – Next decadal survey.

• Basic content is already known.
  – Competed and directed technology development in response to technology prioritizations.
  – RFIs and study teams for missions and probes (e.g., X-ray, Gravitational wave, UV/Visible, …)
  – Studies of potential missions leading to concept studies, e.g., WFIRST (DRM1), WFIRST probe (DRM2), Exoplanet probes, other probes, etc.
RXTE decommissioned on January 5, 2012.


GEMS status pending
Backup Slides
President’s FY13 Budget Request for Astrophysics

NASA Astrophysics Budget:
FY07-FY12 Appropriated and FY13-FY17 Proposed

Real Year $Million

FY04 FY05 FY06 FY07 FY08 FY09 FY10 FY11 FY12 FY13 FY14 FY15 FY16 FY17

JWST
Not JWST
FY2013 President’s Request for NASA Astrophysics

~$633M Total *

- Cosmic Origins
- Physics of the Cosmos
- Exoplanet Exploration
- Astrophysics Explorer
- Astrophysics Research

* Does not include SMD budgets that are bookkept in the Astrophysics budget line
Changes since the Astro2010 Decadal Survey

Astrophysics FY10 President's Budget (less JWST) and Estimates 2011-2023 as Presented to Decadal Survey

- Future Missions ($4B FY13-20)
- Form, Dev & Op Missions
- Mission Enabling, Prog Mgt & Other
- FY13 Pres Bud ($800 M future missions FY13-20, adjusted for Helio Explorer and JWST transfers)
In response to the Astro2010 Decadal Survey recommendations:

- The budget for research awards increased by 10% in FY12
- Theory and Computation Networks: AAAC studying NASA-NSF program
- Suborbital program (payloads, balloons) growth deferred
# Astrophysics ROSES Selection Statistics

## ROSES-2012

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<th>Notification</th>
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## ROSES-2011

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| Elements with NEW STARTS IN FY13 | 734 |

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(FY14-17 estimates are notional)
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*(FY14-17 estimates are notional)*