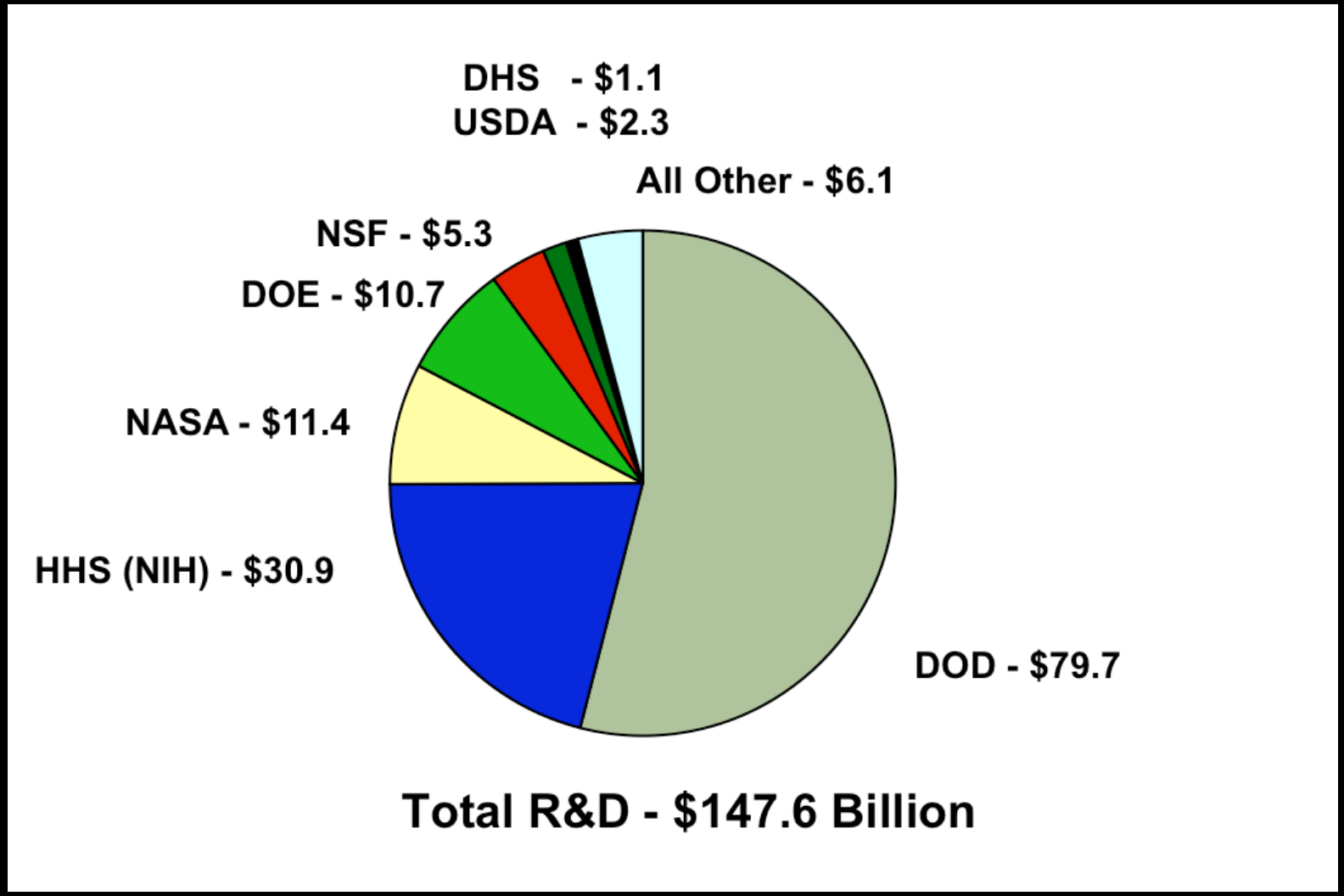
NASA Today

Accomplishments, Challenges, & Opportunities

Christopher J. Scolese
NASA Acting Administrator
June 2, 2009

Total FY 2010 R&D Funding by Agency



FY 2010 Budget Request Summary

TOTAL NASA	17,402	17,782	18,686	18,631	18,613	18,607	18,858
Percent change year-to-year		*2.2%*	*5.1%*	*-0.3%*	*-0.1%*	*0.0%*	*1.3%*

The $18.686 B request represents a $904 million (5%) increase above FY 2009

With addition of $1 billion from Recovery Act, FY 2009-11 represents a $2B increase above FY 2009

Budget Highlights

- Supports Administration's commitment to deploy global climate change research and monitoring system; accelerates Earth Science Decadal Survey Tier 1 missions, including Venture class, and Tier 2 concept studies
- Establishes a new "green aviation initiative"
- Provides resources to safely fly six Space Shuttle flights and retire STS in FY 2010, including flight to deliver Alpha Magnetic Spectrometer
- Completes assembly of ISS in 2010
- Continues work to accomplish March 2015 Ares 1/Orion IOC
- Initiates an Executive-level Human Space Flight Review

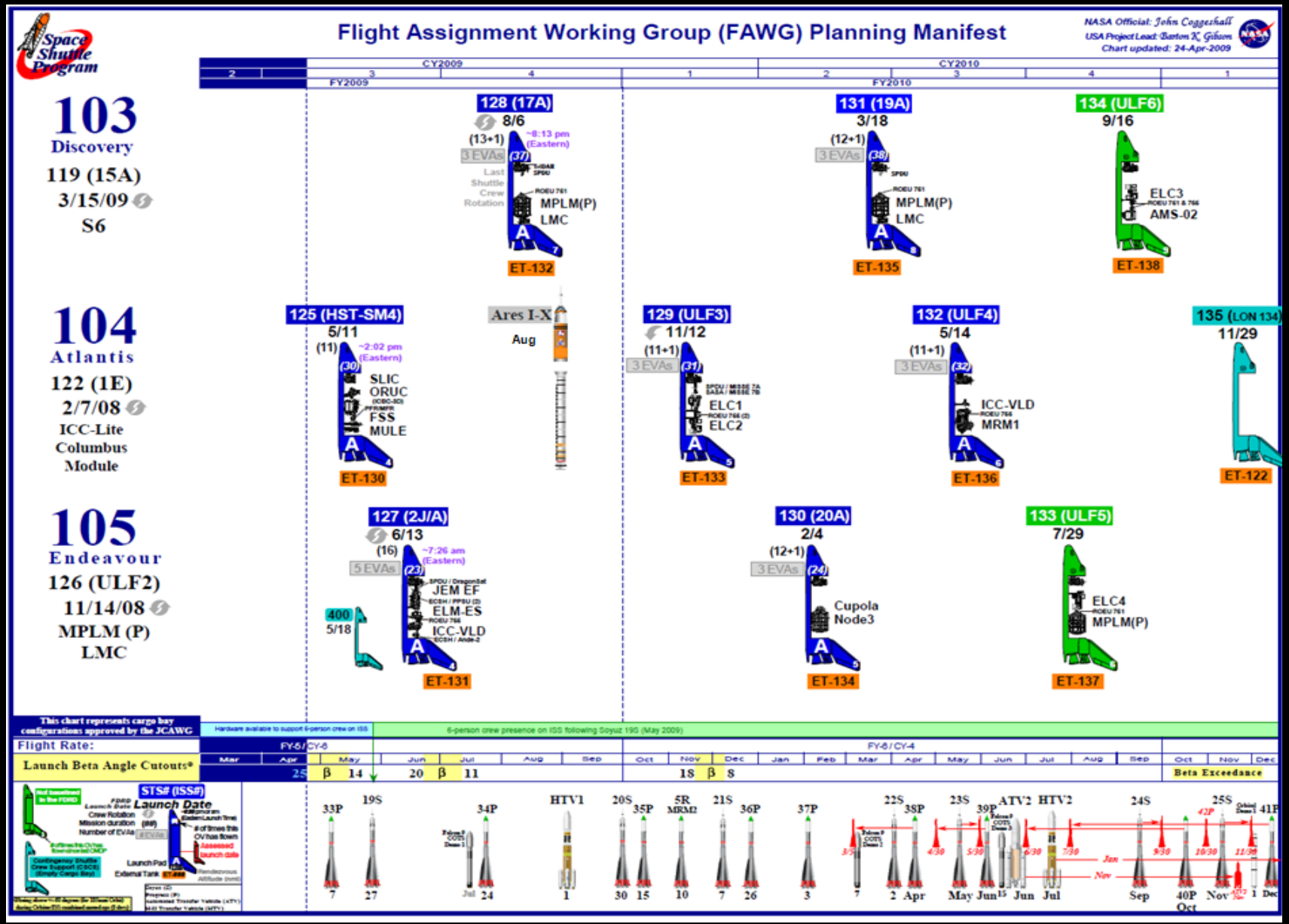
FY 2010 Budget Summary

- Combined with FY 2009 appropriations, the FY 2010 request provides a $1.8B increase to NASA's programs in FY 2009 and FY2010, including
  - $630M increase to Exploration
  - $456M increase to Science
  - $263M increase to Aeronautics
- Facilitates development of critical Earth science missions and Initiates new Venture class Earth science missions
- Continues to develop the next generation of space observatories
- Initiates a new Environmentally Responsible Aviation project
- Adds Shuttle mission to launch AMS and additional supplies to ISS
- Fully supports cargo re-supply to the ISS
- Supports continued development of Ares I, Orion and associated systems and elements
- Directs Agency to undertake Human Spaceflight Review to assess current plans and potential alternatives

Space Ops Mission Directorate: FY 2010 Request

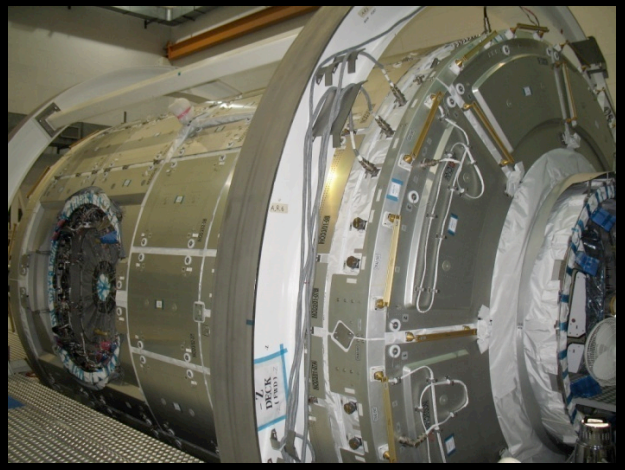
- Flies six Space Shuttle launches in FY 2010 including delivery of the Alpha Magnetic Spectrometer
- Retires the Space Shuttle by the end of FY 2010
- Funds Space Shuttle transition and retirement costs through 2012
- Completes assembly of the International Space Station (ISS)
- Five year request includes an increase for ISS Crew Cargo services to ensure ISS is supportable after Space Shuttle retirement
- Options for ISS operations beyond 2016 will be evaluated during the Human Space Flight Review announced on 7 May 2009
- Manages multiple technology demonstrations including Optical Communications; Communication, Navigation and Networking re-Configurable Testbed (CoNNeCT); and Disruption Tolerant Networking (DTN)

STS Manifest



ISS FY 2010 Plans

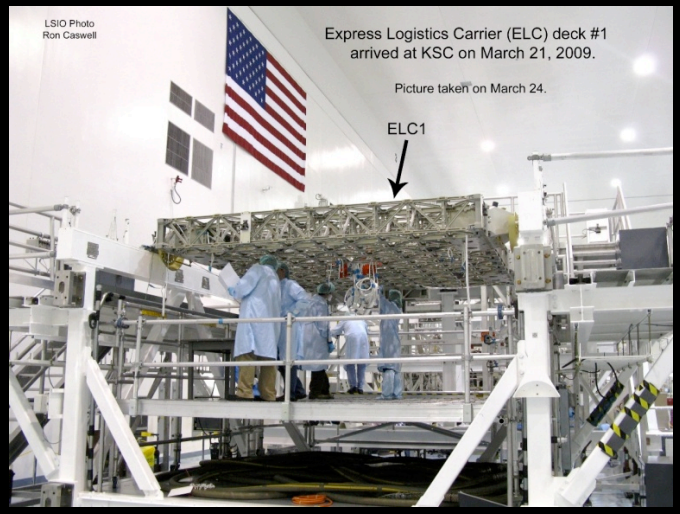
- Complete ISS Assembly
  - Add Node 3 with Cupola
- Prepare to demonstrate commercial cargo transport systems
  - SpaceX Demo 2 (ISS flyby) Apr 2010
  - Demo 3 (berthing) Jun 2010
- Add Russian Mini-Research Module
- Continue stable crew/cargo flight plan
  - 4 Soyuz crew exchanges per year
  - 4-5 Progress cargo re-supply flights per year
- Outfit laboratories with payload facilities
- Pre-positioning critical system spares



Node 3

SpaceX Falcon 1 launch

Window Observational Research Facility (WORF) in processing for 19A launch

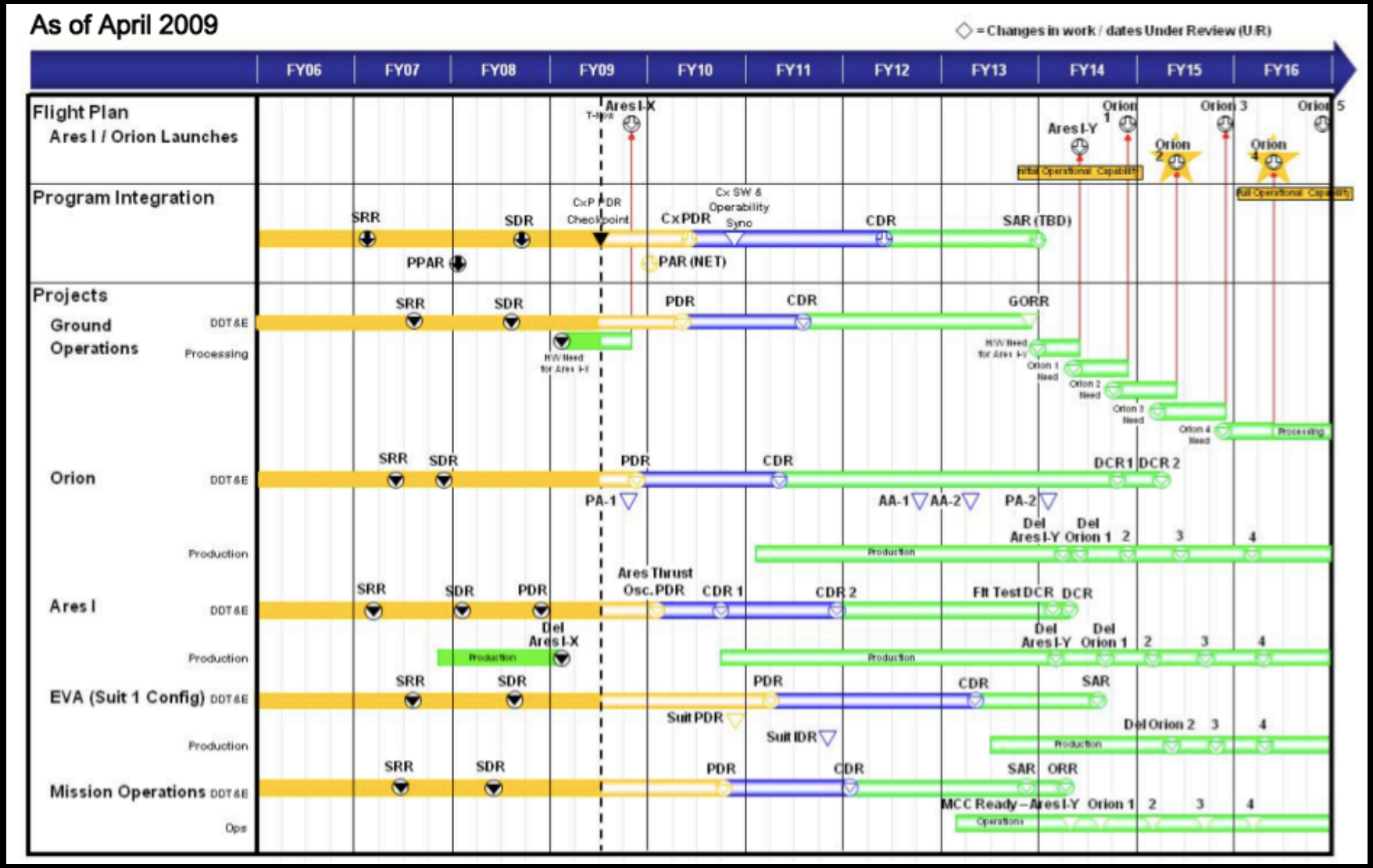


ExPRESS Logistics Carrier deck #1 at KSC

Exploration Systems Mission Directorate Overview

- **NASA's near term plan remains the same: maintain March 2015 goal for the first crewed Orion/Ares flight to the International Space Station**
- **Lunar Reconnaissance Orbiter/Lunar CRater Observation Sensing Satellite ready for launch**
- **Technical progress to date is substantial; Constellation is preparing for system level Preliminary Design Review (PDR)**
  - Ares I PDR has been completed, and we are preparing for Orion PDR as testing continues on critical components and subsystems
  - Abort motor static test for the launch abort system (LAS) that will sit atop Orion (11/08)
  - LAS attitude control motor high thrust test firings #6 and #8 (1/09 and 3/09)
  - Orion post landing and recovery testing (1/09-4/09)
  - Ares drogue parachute drop test #2 (2/09)
  - Completed KSC operations and checkout facility renovation and modification for Orion spacecraft assembly, modification, integration and test (1/09)
  - Completed launch pad lightning protection towers (2/09)
  - Mobile launcher platform-1 handover for Ares I-X test flight modifications (3/09)
- **Continued technology infusion and human research to support Cx and ISS research**
  - Will complete the launch of all planned ISS research facilities
  - Technology development and Infusion continues reducing CxP technical risks
  - Human Research focusing on maximal use of ISS to reduce human health risks

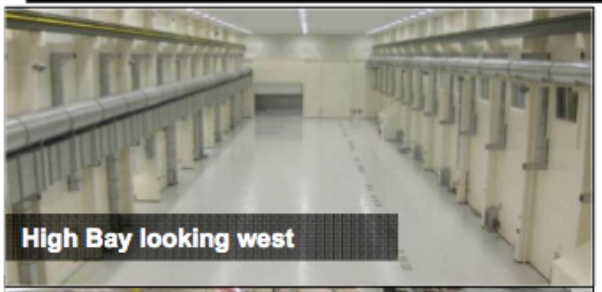
Constellation Summary Schedule - Initial Capability



Constellation - Construction of Facilities Progress

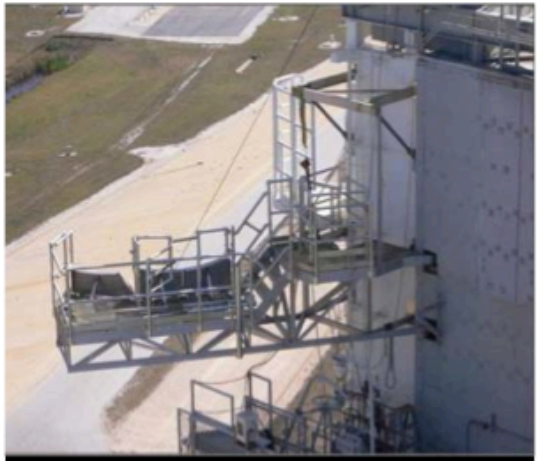
J2X A3 Altitude Test Stand Construction

Launch Complex 39B Lightning Protection System Construction



Orion Manufacturing Facilities at KSC

Hangar AF Mods & Upgrades (Phase I) ~ 90% complete

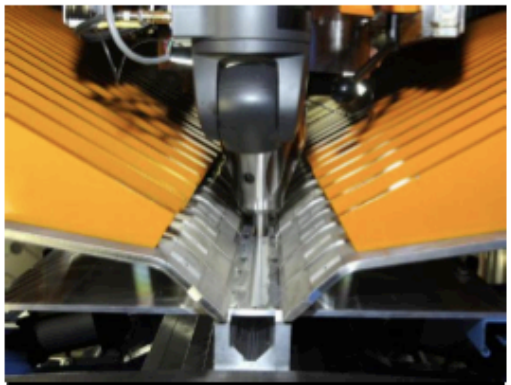


FSAM installed onto RSS

Ares I Technical Progress

J2X Workhorse Gas Generator Test

Deceleration Subsystem (DSS) Drogue Parachute Drop Test (DDT–1)



Friction Stir weld being performed on the new Vertical Weld Tool at MSFC, AL

Common Bulkhead Dome Delivery

Shell Buckling Test 2/5/09, MSFC

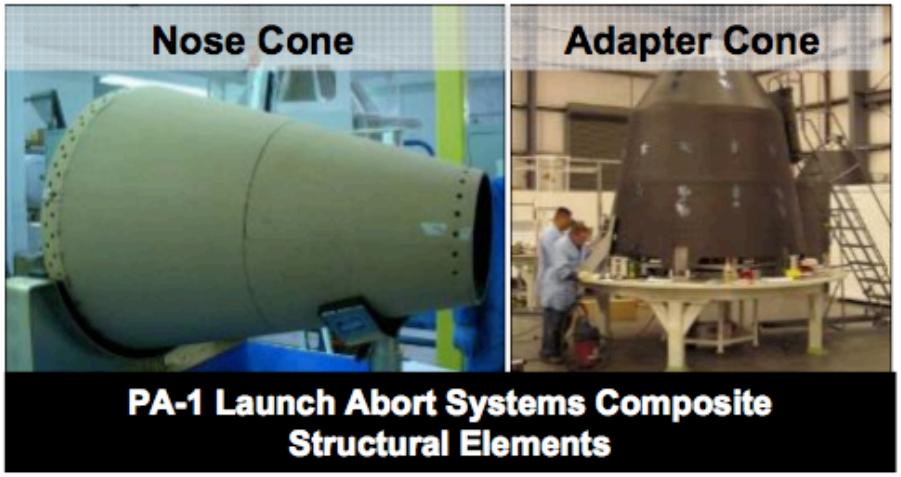
A3 Test Stand Subscale Diffuser Test

Ares I-X Technical Progress

Orion Technical Progress

The boilerplate Orion crew module used for the Orion Launch Abort System Pad Abort-1 flight

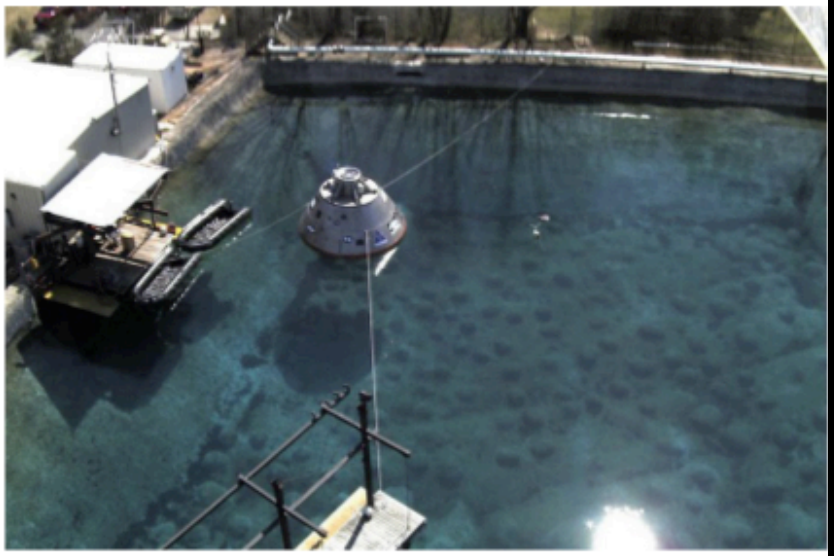
I-X Crew Module and Launch Abort System Arrive at KSC

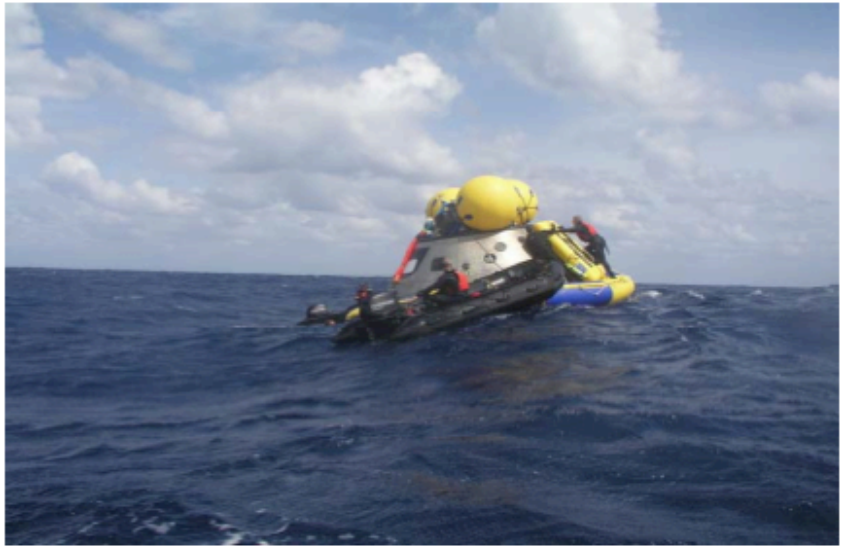


PA-1 Launch Abort Systems Composite Structural Elements

Launch Abort System (LAS) PA-1 Modal Test 12/11/08

Orion PORT Test





Lunar Precursors: LRO / LCROSS

Lunar Reconnaissance Orbiter (LRO)

LRO spacecraft in the Goddard Space Flight Center cleanroom

LRO Ships to KSC

LRO - RF Absorber Wall

Lunar CRater Observation and Sensing Satellite (LCROSS)

LCROSS Completes Thermal Vacuum Testing

Shipment Preparations

Science Mission Directorate - NASA Science Strategy

- **Implement the top NRC Decadal Survey priorities in each Science area**
  - Accelerating Earth Science Decadal Survey Tier 1 missions, including Venture class, and Tier 2 concept studies
  - New Decadal Surveys underway in Astrophysics (2010) and Planetary Science (2011); Heliophysics will begin next year
- **Determine success by achievement of Level 1 science requirements for each mission, not by number of missions**
  - Budgeting all spaceflight projects at the 70% confidence level for life-cycle cost and development schedule
- **Guide an optimal balance among large and small missions, Research & Analysis, and technology development to best further science goals**
- **Pursue partnerships where both interests and capabilities align in order to leverage resources, e.g., ESA on Outer Planets, Mars Exploration, and Dark Energy**

SMD Missions Past 12 Months

Astrophysics

FERMI
Launch–6/11

Kepler
Launch–3/5

Earth Science

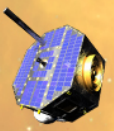
OSTM
Launch–6/20

NOAA-N'
Launch–2/6

OCO
Launch Failure

Heliophysics

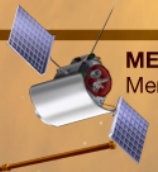
CINDI
Launch–4/16



IBEX
Launch–10/19

Planetary Science

Phoenix
Landing–5/25



MESSENGER
Mercury Flyby–10/6

Cassini Iapetus
Flyby–9/10

Chandrayaan-1 (M3)
Launch–10/22

Cassini Flyby
Titan–2/7

Apt 2008 | May | June | July | Aug | Sept | Oct | Nov | Dec | Jan | Feb | Mar 2009

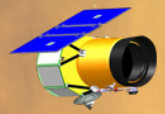
SMD Missions Next 12 Months

Astrophysics

HST SM4
Launch–5/12

Herschel
Launch–TBD

Planck
Launch–TBD



WISE
Launch–11/1

Earth Science

GOES-O
Launch–NET July

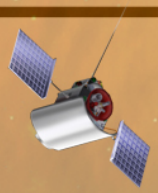
GLORY
Launch–NET Jan

Heliophysics

SDO
Launch–NET Nov

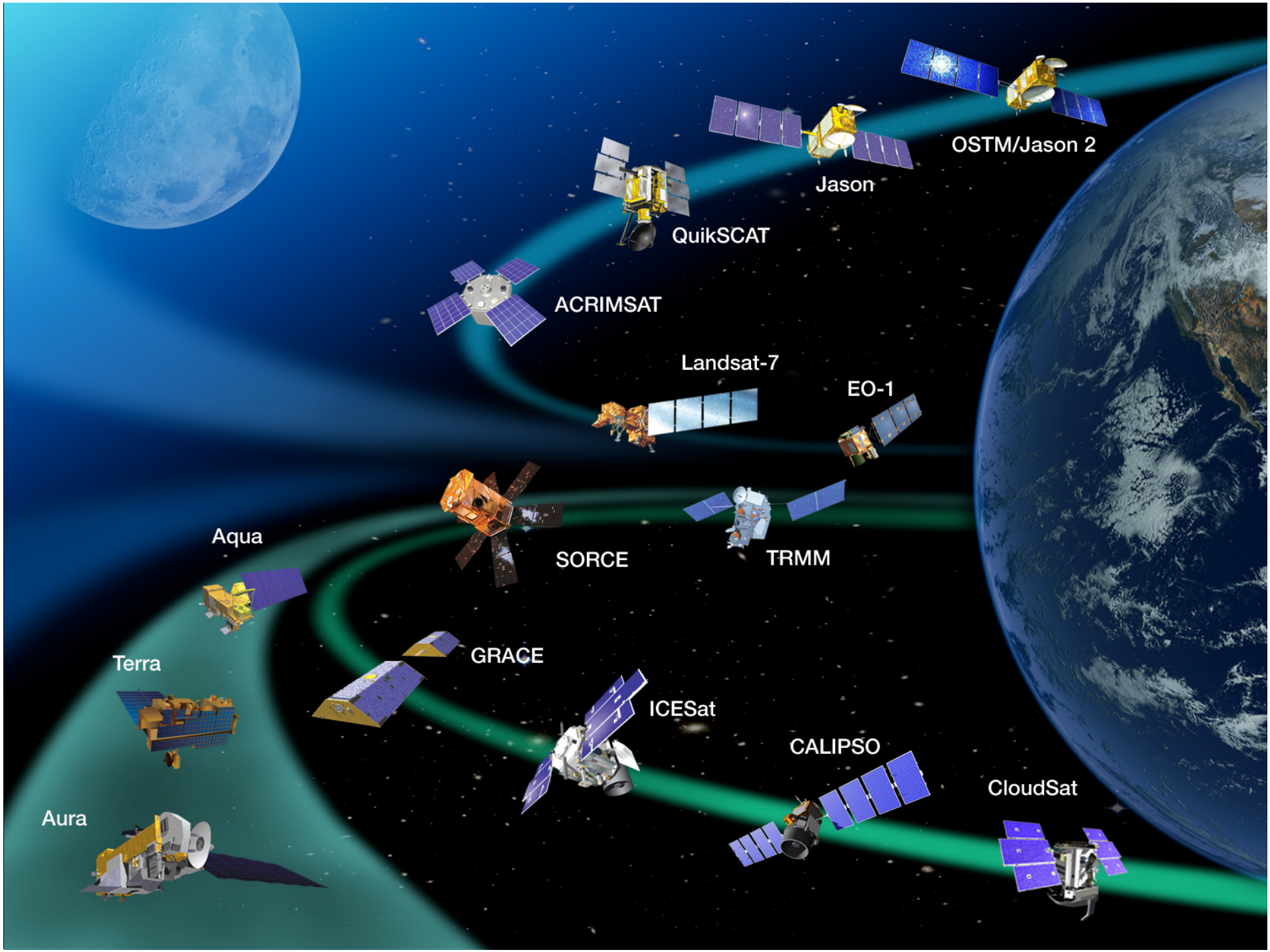
Planetary Science

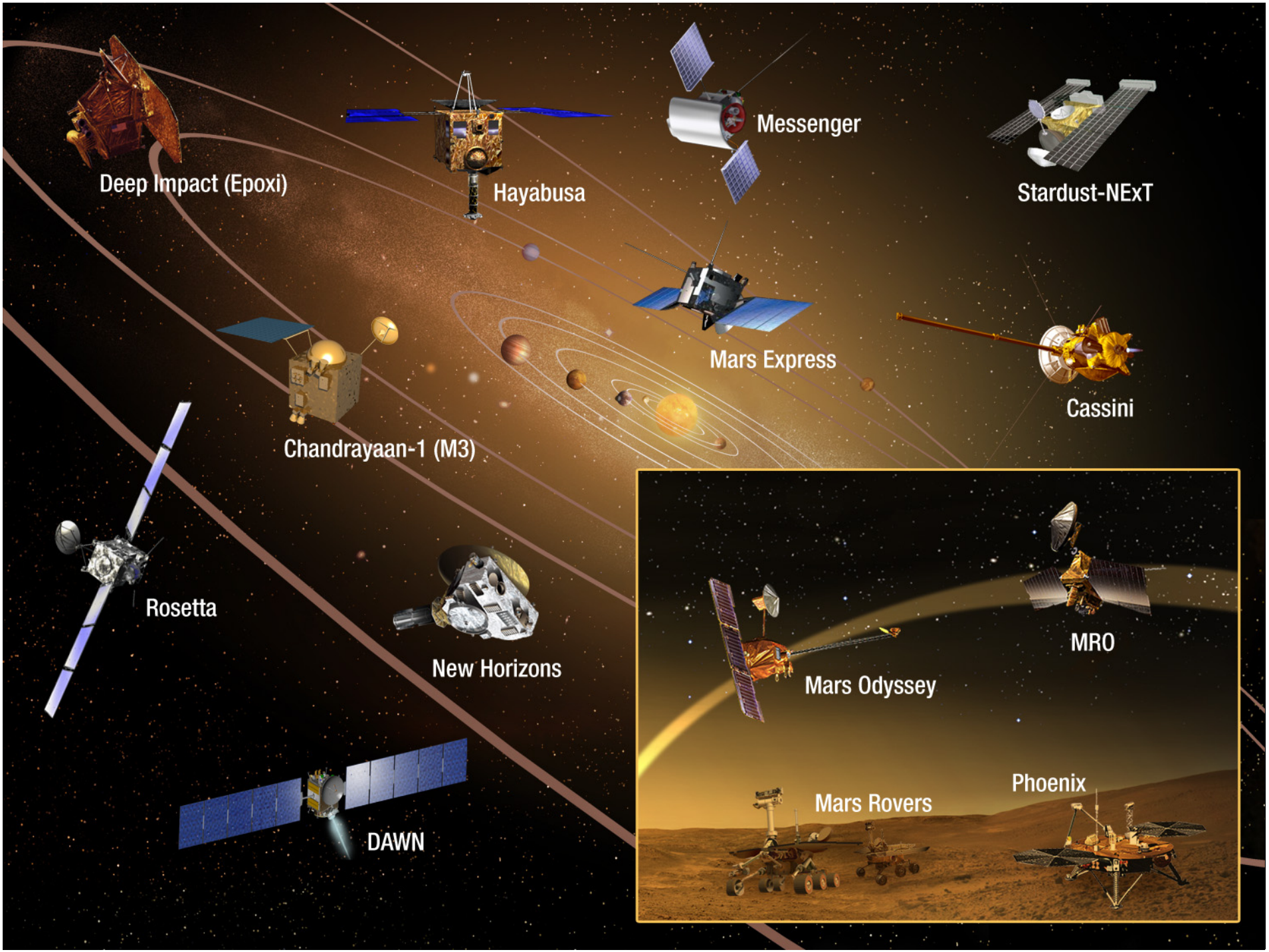
LRO/LCROSS
Launch–6/2



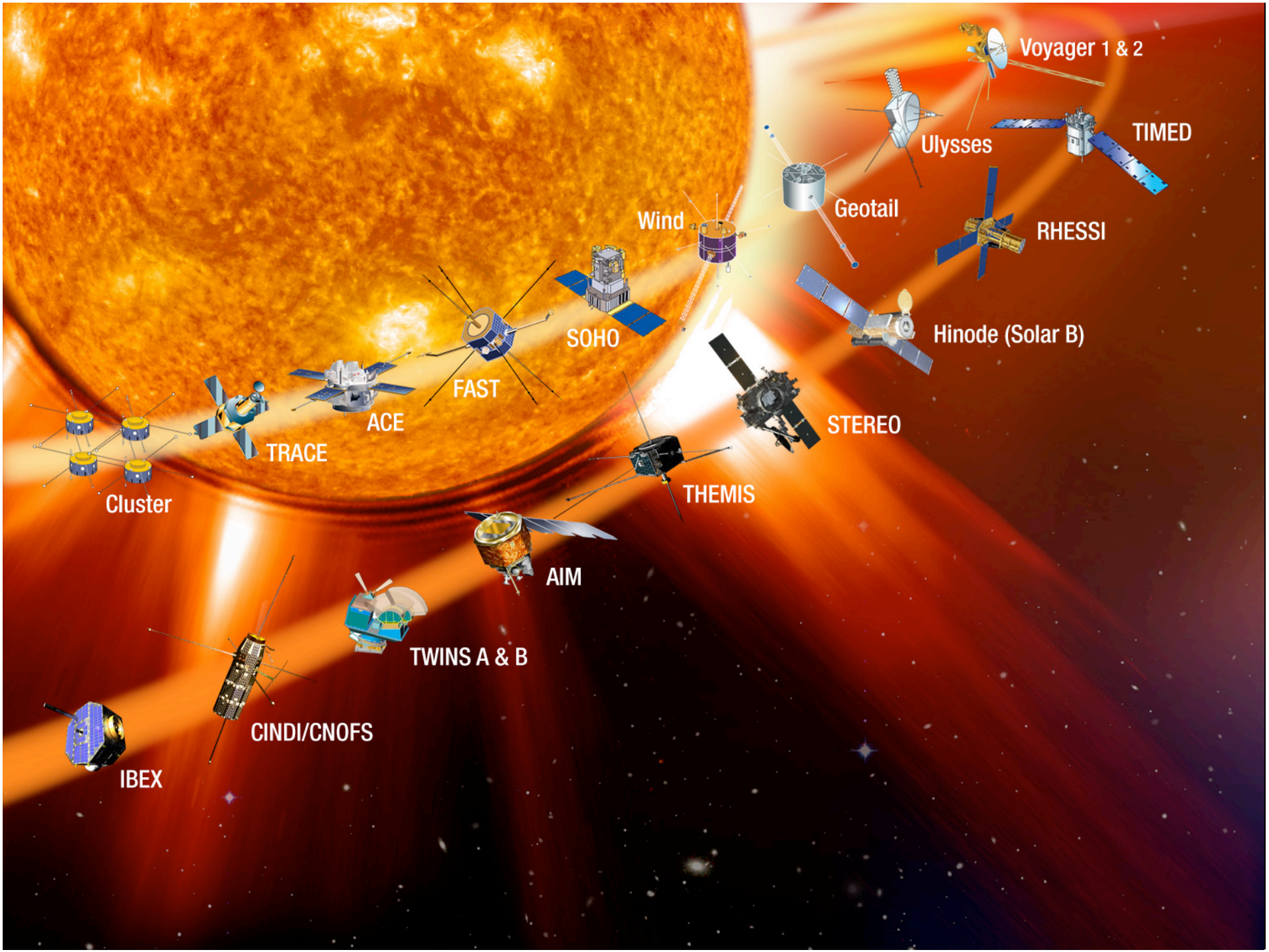
Messenger Flyby
Mercury–9/29

Apr 2009 | May | June | July | Aug | Sept | Oct | Nov | Dec | Jan | Feb | Mar 2010


OSTM/Jason 2
Jason
QuikSCAT
ACRIMSAT
Landsat-7
EO-1
SORCE
TRMM
Aqua
GRACE
Terra
ICESat
CALIPSO
CloudSat
Aura


Deep Impact (Epoxi)
Hayabusa
Messenger
Stardust-NExT
Mars Express
Cassini
Chandrayaan-1 (M3)
Rosetta
New Horizons
DAWN
Mars Odyssey
MRO
Mars Rovers
Phoenix

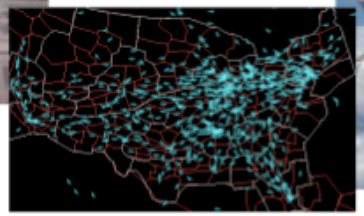
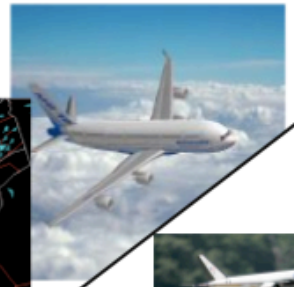
XMM-Newton
FERMI
Hubble
INTEGRAL
RXTE
Swift
GALEX
Suzaku
WMAP
Kepler
Chandra
Spitzer


Voyager 1 & 2
Ulysses
TIMED
Geotail
RHESSI
Wind
SOHO
Hinode (Solar B)
FAST
ACE
STEREO
TRACE
Cluster
THEMIS
AIM
TWINS A & B
CINDI/CNOFS
IBEX

Aeronautics Research - Current Programs

Airspace Systems Program

Directly address the fundamental ATM research needs for NextGen by developing revolutionary concepts, capabilities, and technologies that will enable significant increases in the capacity, efficiency and flexibility of the NAS.

Fundamental Aeronautics Program

Conduct cutting-edge research that will produce innovative concepts, tools, and technologies to enable revolutionary changes for vehicles that fly in all speed regimes.

Aviation Safety Program

Conduct cutting-edge research that will produce innovative concepts, tools, and technologies to improve the intrinsic safety attributes of current and future aircraft.

Aeronautical Test Program

Preserve and promote the testing capabilities of one of the United States' largest, most versatile and comprehensive set of flight and ground-based research facilities.

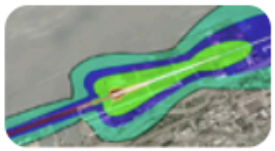
Aeronautics Research - FY 2010

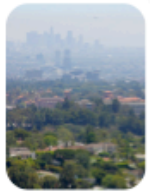
Fundamental Aeronautics Program

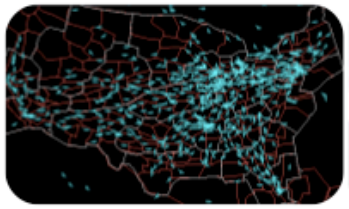
Conduct cutting-edge research that will produce innovative concepts, tools, and technologies to enable revolutionary changes for vehicles that fly in all speed regimes.

Integrated Systems Research Program

Conduct research at an integrated system-level on promising concepts and technologies and explore/assess/demonstrate the benefits in a relevant environment







Airspace Systems Program

Directly address the fundamental ATM research needs for NextGen by developing revolutionary concepts, capabilities, and technologies that will enable significant increases in the capacity, efficiency and flexibility of the NAS.

Aviation Safety Program

Conduct cutting-edge research that will produce innovative concepts, tools, and technologies to improve the intrinsic safety attributes of current and future aircraft.

Aeronautics Test Program

Preserve and promote the testing capabilities of one of the United States' largest, most versatile and comprehensive set of flight and ground-based research facilities.

Concluding Thoughts

- Combined with FY 2009 appropriations, the American Recovery and Reinvestment Act, and the FY 2010 request provides a $1.8B increase to NASA's programs in FY 2009 and FY2010
  - Facilitates development of critical Earth science missions and Initiates new Venture class Earth science missions
  - Continues to develop the next generation of space observatories
  - Initiates a new Environmentally Responsible Aviation project
  - Adds Shuttle mission to launch AMS and additional supplies to ISS
  - Fully supports cargo resupply to the ISS
  - Supports continued development of Ares I, Orion and associated systems and elements
- Sound progress on existing programs
- Review of U.S. Human Space Flight Plans in progress

"The space program has always described our willingness to stretch beyond current boundaries and to look at things in new ways."

President Obama, speaking to STS-125 crew