

Education & Public Outreach

Lars Perkins

Chairman

Education and Public Outreach Committee

NASA Advisory Council

1 August 2013



Topics

- ▶ Who we are
- ▶ Budget Status
- ▶ Sequestration Impact
- ▶ Recommendation Status
- ▶ Recent EPO Meeting Summary
- ▶ Recommendations





Richard
Garriott



Dwayne McCay



Michael Bostick



Peter Shankmar



Bill
Nye



Pilar Montoya



Scott
Parazynski



Doug King



Matthew Chamberlin



Lars Perkins



Stephen Pearse



AMBULANCE

The ~~Taxi~~ Driver Problem





FY 2014 Budget Request

	FY 2012 Actual	FY 2013 Annualized CR	FY2014	Notional			
				FY2015	FY2016	FY2017	FY2018
NASA FY 2014	\$17,770.0	\$17,893.4	\$17,715.4	\$17,715.4	\$17,715.4	\$17,715.4	\$17,715.4
Science	\$5,073.7	\$5,115.9	\$5,017.8	\$5,017.8	\$5,017.8	\$5,017.8	\$5,017.8
Earth Science	\$1,760.5	-	\$1,846.1	\$1,854.6	\$1,848.9	\$1,836.9	\$1,838.1
Planetary Science	\$1,501.4	-	\$1,217.5	\$1,214.8	\$1,225.3	\$1,254.5	\$1,253.0
Astrophysics	\$648.4	-	\$642.3	\$670.0	\$686.8	\$692.7	\$727.1
James Webb Space Telescope	\$518.6	-	\$658.2	\$645.4	\$620.0	\$569.4	\$534.9
Heliophysics	\$644.8	-	\$653.7	\$633.1	\$636.8	\$664.3	\$664.6
Aeronautics Research	\$569.4	\$572.9	\$565.7	\$565.7	\$565.7	\$565.7	\$565.7
Space Technology	\$573.7	\$578.5	\$742.6	\$742.6	\$742.6	\$742.6	\$742.6
Exploration	\$3,707.3	\$3,790.1	\$3,915.5	\$3,952.0	\$3,970.7	\$3,799.0	\$3,589.3
Exploration Systems Development	\$3,001.6	-	\$2,730.0	\$2,789.8	\$2,801.5	\$2,818.3	\$2,819.5
Commercial Spaceflight	\$406.0	-	\$821.4	\$821.4	\$821.4	\$590.0	\$371.0
Exploration Research and Development	\$299.7	-	\$364.2	\$340.8	\$347.8	\$390.7	\$398.7
Space Operations	\$4,184.0	\$4,247.8	\$3,882.9	\$4,014.9	\$3,996.2	\$4,167.9	\$4,377.6
Space Shuttle	\$596.2	-	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
International Space Station	\$2,789.9	-	\$3,049.1	\$3,169.8	\$3,182.4	\$3,389.6	\$3,598.3
Space and Flight Support (SFS)	\$797.9	-	\$833.8	\$845.1	\$813.8	\$778.3	\$779.3
Education	\$136.1	\$136.9	\$94.2	\$94.2	\$94.2	\$94.2	\$94.2
Cross Agency Support	\$2,993.9	\$3,012.2	\$2,850.3	\$2,850.3	\$2,850.3	\$2,850.3	\$2,850.3
Center Management and Operations	\$2,204.1	-	\$2,089.7	\$2,089.7	\$2,089.7	\$2,089.7	\$2,089.7
Agency Management and Operations	\$789.8	-	\$760.6	\$760.6	\$760.6	\$760.6	\$760.6
Construction & Envrmtl Compl Restoration	\$494.5	\$401.9	\$609.4	\$440.9	\$440.9	\$440.9	\$440.9
Inspector General	\$38.3	\$38.2	\$37.0	\$37.0	\$37.0	\$37.0	\$37.0
NASA FY 2014	\$17,770.0	\$17,893.4	\$17,715.4	\$17,715.4	\$17,715.4	\$17,715.4	\$17,715.4





Source of majority of EPO funds

Science Mission Directorate Policy

Policy and Requirements for the

Para #	NPR 7120.5 Requirement Statement	Requirement Owner	Tailor	MD AA	CD	PM	Comply?	Justification	Approval
Tabl I-1	11. Security Plan [Baseline at SDR] [per NPD 1600.2 and NPRs 1600.1, 1040.1, and 2810.1]	OPS OCIO				A			
Tabl I-1	12. Threat Summary [Baseline at SDR]	OCE	X			A			
Tabl I-1	13. Technology Transfer (formerly Export) Control Plan [Baseline at SDR] [per NPR 2190.1]	OHIR				A			
Tabl I-1	14. Education Plan [Baseline at SDR]	OE				A			
Tabl I-1	15. Communications Plan [Baseline at SDR]	OComm				A			
Tabl I-1	16. Environmental Plan [Baseline at SDR]	OCE				A			

- SMD missions must have an E/PO program that supports NASA's strategic goals and objectives for education and outreach, contributes to NASA's education portfolio, and is aligned with SMD's E/PO portfolio.

- SMD missions must have an E/PO program that is funded with at least 1% of the total prime mission cost excluding launch vehicle.
- SMD missions will designate an E/PO Lead who has the qualifications and experience necessary to successfully implement the mission's E/PO program.
 - SMD missions will partner with NASA and non-NASA organizations as appropriate in order to increase the quality and reach of the E/PO program.

1.2 Rationale for Mission E/PO Requirements

The SMD E/PO lead is required to report on the SMD E/PO portfolio and show that it aligns with the NASA Education portfolio. The Lead is responsible for reporting E/PO metrics for

EDUCATION INVENTORY FUNDING TRACE

\$ in Millions	FY 2012 Budget Estimate	Changes	FY 2014 Budget Request
Total	202.5	(93.1)	109.4
Education	138.4	(44.2)	94.2
Aerospace Research and Career Development	58.4	(25.4)	33.0
<i>NASA Space Grant</i>	40.0	(16.0)	24.0
<i>ESPCoR</i>	18.4	(9.4)	9.0
STEM Education and Accountability	80.0	(18.8)	61.2
<i>MUREP</i>	30.0	0.0	30.0
<i>STEM Education and Accountability Projects</i>	40.0	(8.8)	31.2
<i>Formal and Informal Education</i>			
<i>Innovation in Education</i>			
<i>Evaluation, Performance, Monitoring, & Accountability</i>			
<i>Informal STEM Education</i>	10.0	(10.0)	
<i>GLOBE</i>		4.5	4.5
<i>STEM Interagency Coordination</i>		6.8	6.8
<i>STEM Facilitation</i>		19.9	19.9
Mission Directorates Subtotal	64.1	(48.9)	15.2
Science	41.9	(41.9)	0.0
Aeronautics Research	3.3	(3.3)	0.0
Space Technology	10.4	4.8	15.2
Exploration	4.4	(4.4)	0.0
Space Operations	0.0	0.0	0.0
Cross Agency Support	4.1	(4.1)	0.0



Education Budget Decimated

Total:

203 → 109

2012

2014

- Space Grant
- EPSCOR
- MUREP
- Space Technology Fellowship

**Non-
Directed:**

64 → 20

2012

2014

\$54 mm cut from Directorates (\$42 from SMD)



And then something bad happened ...



“Would you please elaborate on ‘then something bad happened’?”



FY14 Transitional Year For EPO

▶ Recommendation

- ▶ Rather than halting most all EPO programs immediately, fund and recast FY14 as a transitional year where existing programs can be evaluated, and slated for shutdown, transfer to other agencies, or continuance in an orderly fashion. In particular, the Agency should **fight** for continuance of EPO activities that are enabled by capabilities that are uniquely NASA's.

▶ Reason

- ▶ NASA EPO Programs are arguably the most inspirational and successful infusion of science into the public consciousness. In a time of austerity we recognize it is important to consolidate education efforts and eliminate redundancies. NASA programs built around missions such as Hubble and Curiosity are, however, unique and NASA specific, as they are built around dynamic missions, not textbook knowledge. We feel thoughtful deliberation is necessary to develop a transition plan which preserves NASA's unique capabilities, eliminates redundancies, and best serves the interests and strategic vision of our nation.

▶ Consequences of No Action

- ▶ Immediate shutdown will promote...
NASA's Office of Education appreciates the support and insight of the NASA Advisory Council; however, non-concurs with the recommendation. Consistent with the Administration's plan, educational programs will significantly impact our education capability during this critical time.



Remove Restriction on Center EPO Spending

▶ Recommendation

- ▶ If a NASA mission team, along with the office of education, determine that an educational initiative is in the best interests of the mission, and can identify funding from non-educational budget funds, they should have the authority to spend those funds for that purpose.

▶ Reason

- ▶ Citizen science, participatory exploration, “crowdsourcing”, and public engagement are often critical mission components of a mission, potentially including making contributions to the mission’s science return.

▶ Consequences of No Action

- ▶ Prohibition on the use of available non-education budget funds for public outreach activities unnecessarily further cripples the ability of NASA to engage the public in the way that it uniquely can.



NASA Response:
NASA’s Office of Education appreciates the support and insight of the NASA Advisory Council; however, non-concurs with the recommendation. Consistent with the Administration’s plan,

House & Senate Proposed Bills

<i>Programmatic Account Snapshot</i>	<i>FY 2013 Op Plan</i>	<i>Delta</i>	<i>FY 2014 Request</i>	<i>FY 2014 HAC MARK</i>	<i>FY 2014 SAC MARK</i>
Education	116.2	(22.0)	94.2	122.0	116.6
<i>Aerospace Research and Career Development</i>	53.9	(20.9)	33.0	33.0	58.0
NASA Space Grant	37.2	(13.2)	24.0	24.0	40.0
EPSCoR	16.7	(7.7)	9.0	9.0	18.0
<i>STEM Education & Accountability</i>	62.3	(1.1)	61.2	89.0	58.6
Minority University Research Education Program	27.9	2.1	30.0	30.0	30.0
STEM Education & Accountability Projects	25.1	6.1	31.2		
Informal Education	9.3	(9.3)			
STEM Facilitation and Coordination	0.0			59.0	28.6



2013 / 2014 Comparison

- ▶ **2013:**

- ▶ $34.4 + 53.7 = 78.1$ (41.9)
HQ MD SMD

- ▶ **2014 Proposed:**

- ▶ $19.9 + 19.9 = 19.9$ (0)

- ▶ **2014 HAC Mark**

- ▶ $59 + 0 = 59$ (0)

- ▶ **2014 SAC Mark**

- ▶ $28.6 + 0 = 28.6$ (0)

Will restriction on MD ed spending be lifted?



4 March 2013 Meeting

- ▶ DC, 6 In Person

- ▶ AGENDA

- ▶ Education Briefing: Dr. Roosevelt Johnson
- ▶ Communication Briefing: Mr. David Weaver
- ▶ Educational Climate Model Dr. Mark Chandler
- ▶ Hubble EPO Dr. Hussein Jirdeh
- ▶ ISS EPO Dr. Camille Alleyne
- ▶ Asteroid Grand Challenge Mr. Jason Kessler
- ▶ Planetary Science Plan Dr. James Green



Statutory Requirements for STEM Education

National Science and Technology Council (NSTC) Committee on STEM Education (CoSTEM) was established pursuant to the requirements of Sec. 101 of the America COMPETES Reauthorization Act of 2010.

- It requires NASA to actively engage in collaborations with other federal agencies to ensure the Agency's programs are supportive of national STEM priorities.
- The CoSTEM will serve as part of the internal deliberative process of the NSTC and provides overall guidance and direction. The purpose of the CoSTEM is to coordinate Federal programs and activities in support of STEM education.
- In accordance with the Act, CoSTEM is currently reviewing STEM education activities and programs, and the respective assessments of each, throughout Federal agencies to ensure effectiveness; coordinating, with the Office of Management and Budget, STEM education activities and programs throughout Federal agencies; and will develop and implement through the participating agencies a 5-year STEM education strategic plan, to be updated every 5 years.



**Original COSTEM report
did NOT recommend
STEM activity
consolidation into 3
agencies**

COSTEM → WH → ^{BUDGET+}COSTEM → COMPROMISE



EDUCATION

An Invisible Hand Behind Plan To Realign U.S. Science Education

Meet the master bureaucrat behind President Obama's plan to reshuffle the federal government's \$3-billion-a-year science budget.

An art exhibit in downtown Washington, D.C. features the pictures and words of 89 Washington movers and shakers. The exhibit at the National Portrait Gallery, entitled *The Network*, includes high-profile politicians such as Nancy Pelosi, Eric Cantor, and Karl Rove and renowned scientists turned policymakers such as Nobelists Harold Varmus and Steven Chu. A few, like journalist Cokie Roberts, have earned fame for explaining the ways of Washington to the public. And then there's Kathryn Stack.

Stack is deputy associate director for education and human resources at the White House Office of Management and Budget.

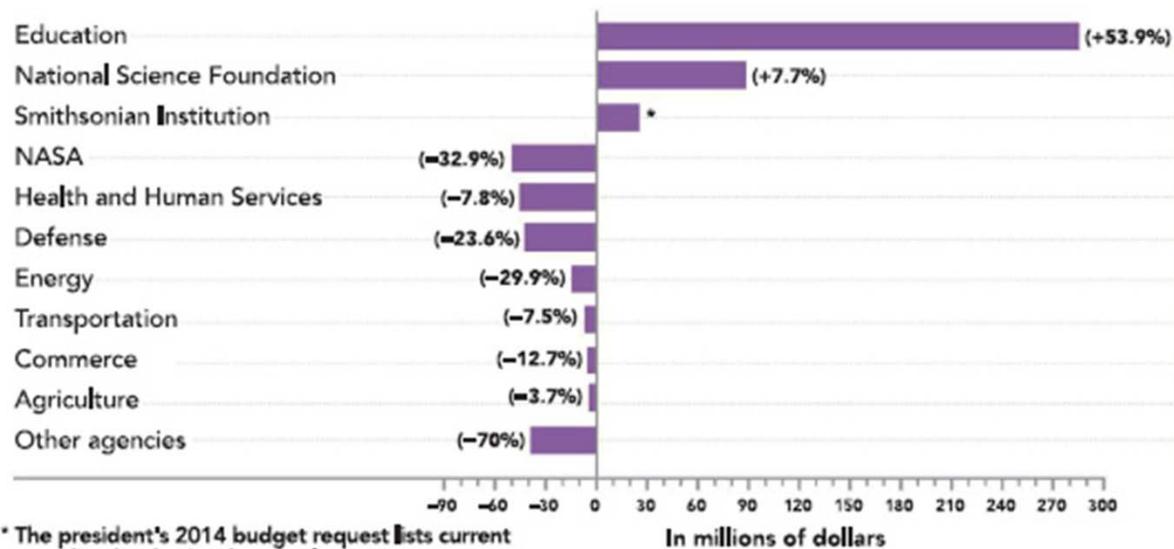
"Several people in Chicago who he opened in understate cracies I Desp anonym make St may be addition walls of watched budget

the number in half (see graphic, next page) and severely curtail STEM activities at the National Institutes of Health (NIH) (see sidebar, p. 340), NASA, and several other so-called mission agencies. At the same time, it would strengthen the efforts of the Department of Education, the National Science Foundation (NSF), and the Smith

The proposed reshuffling hit the U.S. scientific community like a bombshell. For starters, they hadn't seen it coming and were miffed that they weren't consulted. "We are disturbed with the nontransparent process by which this proposed consolidation was developed," wrote the Association of American Universities and the Association of Public and Land-grant Universities in a 2 July letter to John Holdren, the president's science adviser.



Putting the Squeeze on STEM Education Programs





NASA Education

Current Activities and Plans

*Advancing high quality
STEM education using
NASA's unique capabilities*

*Dr. Roosevelt Johnson
Deputy Associate Administrator
for Education
July 30, 2013*





STEM Reorganization Background

- The President has placed a very high priority on using government resources more effectively to meet national goals. As a result, the Administration is launching a bold reorganization of STEM education program.
- The Administration has set goals of improving STEM education by preparing and training 100,000 new, effective STEM teachers and 1 million STEM graduates.
 - Developing talent in science, technology, engineering, and mathematics (STEM) is critical to our Nation's capacity to create and innovate. STEM occupations are projected to grow much faster than others; 15 of the 20 fastest growing jobs require a strong background in math and science.
- Nearly \$3 billion is invested in STEM education government-wide
 - Federal STEM investments have proliferated over the years to include more than 220 programs across 13 different agencies. This fragmented approach to investing in STEM education has made it difficult to ensure that Federal efforts are coherent, strategic, and leveraged for greatest impact.



STEM Reorganization Goals

- Increase impact on STEM achievement and outcomes by supporting a cohesive national strategy that reaches **more students, more teachers, more effectively**.
- Improve outcomes on a broad scale and increase the pool of STEM graduates, in particular among under-represented groups.
- Re-orient Federal policy to meet the needs of those delivering STEM education: schools, districts, States, and post-secondary institutions.
- Support and scale-up evidence-based approaches.
- Restructure functions to ensure all STEM agencies can focus on what they do best.



Reorganization of Federal STEM Education: New Roles

Education

K-12 instruction: The Department of Education will support partnerships between school districts and universities, science agencies and their labs and bases, businesses and others to transform teaching and learning at the K-12 level. ED will help organize many of our Nation's school districts into STEM Innovation Networks that can develop, share and replicate best practices for effective teaching and provide rich and up-to-date content knowledge.

NSF

Undergraduate education and fellowships: The National Science Foundation will focus on improving undergraduate STEM instruction through evidence-based reforms. They will also create a more coherent system of graduate fellowships from a range of fragmented programs.

Smithsonian

Infrastructure development to support STEM instruction and engagement: The Smithsonian Institution will work with Federal agencies and other science partners to harness their unique expertise and resources to make relevant materials, on-line resources, and effective delivery mechanisms available to more students.

Federal Science Mission Agencies

Identification of content and critical federal assets for classroom use: Federal science mission agencies will play an active role in developing and implementing these initiatives to ensure they align with agency and national goals. The Innovation Networks will create a streamlined path to the classroom so that the knowledge base of our science agencies will be accessible to more districts and teachers and have a greater impact on more students.



NASA Approach to STEM Education

- The Agency's education efforts will be restructured into a consolidated education program coordinated through the Education Coordinating Council (ECC) to support the Administration's FY 2014 STEM Education plan.
- The Agency's education efforts will use evidence-based competitive processes to fund the best education and public outreach programs within NASA and coordinate closely with the Department of Education, the National Science Foundation, and the Smithsonian Institution to broaden the reach of NASA's capability to inspire and educate.
- The Agency will align its STEM education investments in accordance with the 5-Year Strategic Plan provided in the Committee on STEM Education (CoSTEM) National Science and Technology Council (NSTC) report.
- The STEM Education Reorganization Initiative preserves Space Grant, EPSCoR, MUREP and GLOBE programs at NASA and refocuses \$27 million to facilitate the wider application of its best education assets.



FY 2014 Programmatic Goals

STEM Education & Accountability (SEA) - \$61.2M

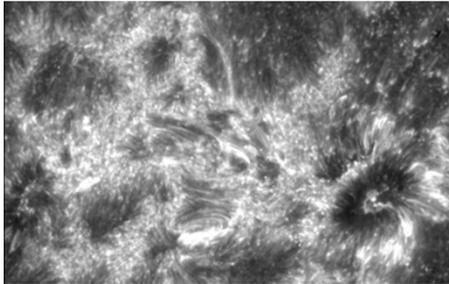
- Provides competitive opportunities for universities, schools, NASA centers, visitor centers, institutions of informal education, and other non-profit organizations.
- Highlights content, workforce, resources and facilities from all NASA mission directorates, and expands the Agency's reach through content imbedded in STEM coordination efforts.
- Supports undergraduate participation in STEM research and education, preparing future scientists and engineers to enter the STEM workforce.
- Funds activities and assets that provide educators, learners, institutions or communities with authentic experiences based on NASA's mission. Allows education access to NASA flight platforms (e.g. ISS, SOFIA, reduced gravity aircraft, EarthKAM, etc.).
- Ensures broad representation of underserved and underrepresented learners, educators and communities in NASA STEM activities and supports institutions working to increase diversity in STEM fields.



State of NASA Communications Update to NAC EPO Subcommittee

David Weaver
July 30, 2013

Communicating NASA's Story – Recent work and accomplishments



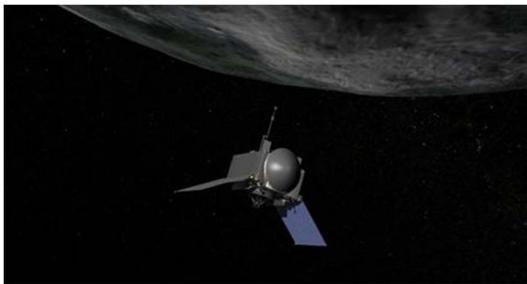
**IRIS offers first look at Sun's
mysterious atmosphere**
July 17



**Astronauts climb aboard
CST-100 mockup**
July 23



**Earthlings en mass waved at Saturn
for a planetary portrait session
being snapped by Cassini**
July 19



**NASA Sees Enthusiastic
Response to Asteroid Call
for Ideas**
July 26

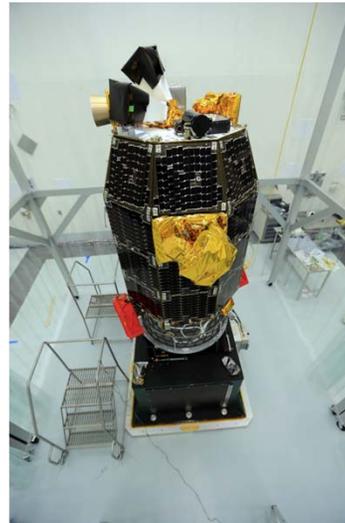


**Tenth Parachute Test for
NASA's Orion Adds 10,000
Feet of Success**
July 24

Communicating NASA's Story – Upcoming events



**Curiosity landing 1-year
anniversary
August 5/6**



**LADeE launch @ Wallops
September 6**



**MAVEN launch
November 2013**



**Antares launch @ Wallops
September, 2013**

Communicating NASA's Story – NASA on Social Media



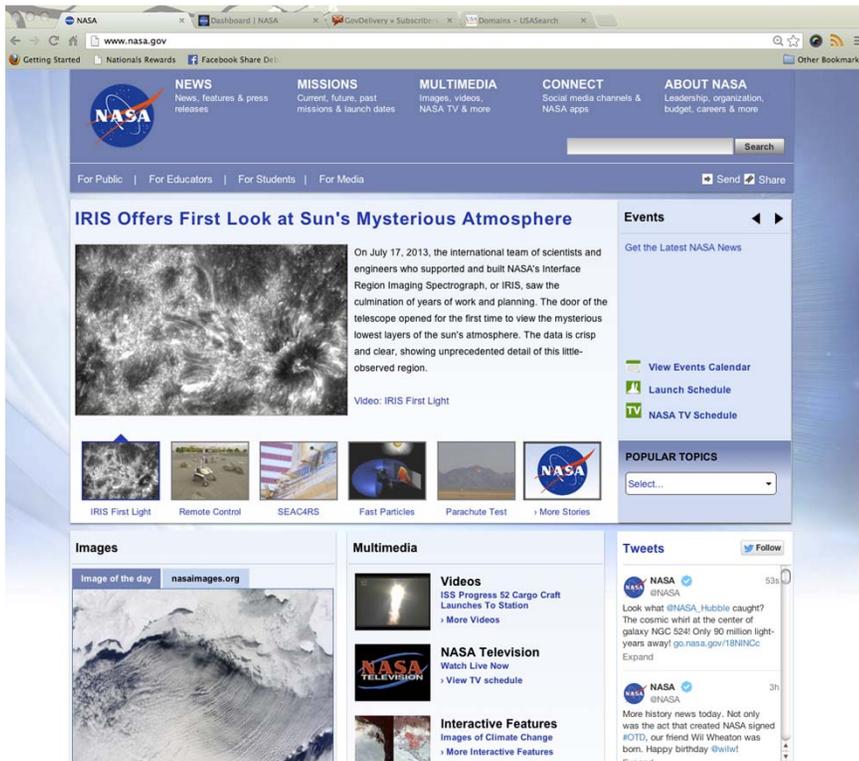
- 450+ NASA social media accounts throughout the agency
- 9 different platforms and counting
- Winner of SXSW Interactive Award for Social Media, 5 Shorty Awards and the Space Foundation's Douglas S. Morrow Public Outreach Award
- Marketingcharts.com ranked @NASA (#4) of the top 10 brands on Twitter
- Rated by Nestivity as the 8th most engaged brand on Twitter.



- @NASA on Twitter
 - 2009 - ~1,000 followers
 - Today - ~4.4 million followers (#1 in the federal government)
 - 44 astronauts on Twitter
 - @Astro_Mike has 1.2+ million followers
- NASA Page on Facebook
 - 2009 - ~150,000 likes
 - Today - ~2.1+ million likes (#2 in the federal government behind the U.S. Marine Corps)
- NASA Page on Google+
 - 2009 – Didn't exist!
 - Today – We're in ~980,000 circles (#2 in the federal government behind the White House)
 - Astronaut Ron Garan is in 3 million circles
- NASA on Foursquare
 - 2009 – Didn't exist!
 - Today - 530,000 followers (#1 in the federal government)



Communicating NASA's Story – Web Infrastructure Transition



- NASA.gov has transitioned to new infrastructure under OCIO's WESTPRIME contract
 - Open-source content-management system (Drupal)
 - External search provided by USA Search (GSA implementation of Bing)
 - Videos hosted on YouTube
 - Live NASA TV streaming provided via Ustream, YouTube and Limelight
 - Switch to government-wide Google Analytics program
- Page design refreshed
 - Lighter color palette to partially address user complaints of visual clutter
 - New area emphasizing live events, as requested by users during Ideascale implementation in 2012.
- Planning for redesign of www.nasa.gov in 2014
 - Somewhat tighter integration with social media
 - Recognition that 70 percent of our existing audience doesn't engage with social media
 - Responsive design to accommodate growing use of smartphones

Web Overhaul



- New Prime Contractor
- Drupal Content Management
- Missions can enter/update own content
- Swtchover end of June, still in Progress
- Better search (Bing)
- Videos Consolidated on YouTube (www.youtube.com/nasa)
- Full redesigned in '14, unfunded at this time
- CCC multimedia working group for digital media to continue consolidation and cleanup efforts
- 7120 solves a lot of this on a going forward-basis

One place for all videos!



The screenshot shows the NASA YouTube channel page. At the top, the browser address bar displays 'www.youtube.com/nasa'. The YouTube interface includes a search bar, an 'Upload' button, and the user profile 'lars@larsperkins.com'. The channel banner features the NASA logo and a starry space background. Below the banner, the channel name 'NASA.gov' is shown with a 'Subscribed' button and a subscriber count of 1,910. The main content area is divided into three sections: 'What to watch next' featuring a video titled 'Tropical Storm Gil - July 31, 2013' with 1,246 views; 'Recent activity' listing three videos including 'Tropical Storm Gil - July 31, 2013' (uploaded 19 hours ago), 'Women at NASA: Linda McCain' (uploaded 1 day ago), and 'Eilene Galloway, The Woman Who Helped Create NASA' (uploaded 2 days ago); and 'Featured Channels' on the right, listing various NASA-related channels like 'NASA', 'Reel NASA', 'NASA Ames Research Center', 'NASA Glenn Research Center', 'NASA Goddard', 'NASA JPL Videos', 'NASA Kennedy Space Center', 'NASA's Langley Research Center', 'NASA Marshall TV', and 'Science@NASA'. A 'See all' link and 'Popular channels on YouTube' section are also visible.

Web redesign





NEWS
News, features & press releases

MISSIONS
Current, future, past missions & launch dates

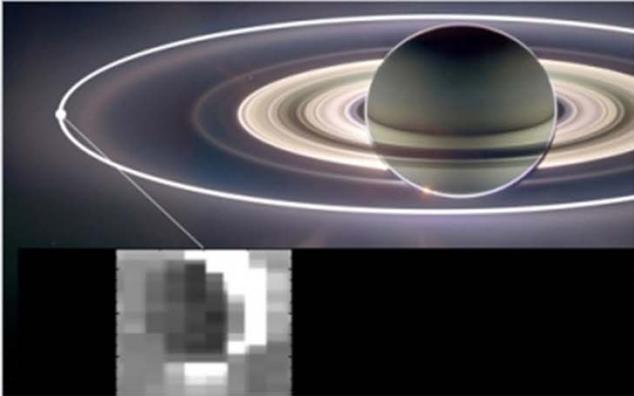
MULTIMEDIA
Images, videos, NASA TV & more

CONNECT
Social media channels & NASA apps

ABOUT NASA
Leadership, organization, budget, careers & more

For Public | For Educators | For Students | For Media

Cassini Reveals Forces Controlling Saturn Moon Jets



The intensity of the jets of water ice and organic particles that shoot out from Saturn's moon Enceladus depends on the moon's proximity to the ringed planet, according to data obtained by NASA's Cassini spacecraft. The finding adds to evidence that a liquid water reservoir or ocean lurks under the icy surface of the moon.

Events

36 14 56 51

DAYS HOURS MIN SEC

Until Sept. 6 Launch of Lunar Atmosphere and Dust Environment Explorer (LADEE)

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asteroid mission 

About 80,200 results • [Advanced Search](#)

- Everything
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- Press Releases (2013 -
- Press Releases (1990-2012)
- Images
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- Videos

[NASA's Asteroid Initiative Benefits From Rich History](#)

www.nasa.gov/.../asteroid_initiative.html

4 months ago

NASA's FY2014 budget proposal includes a plan to robotically capture a small near-Earth asteroid and redirect it safely to a stable orbit in the Earth-moon system where astronauts can visit and explore it.

[NASA - NASA to Launch New Science Mission to Asteroid in 2016](#)

www.nasa.gov/topics/.../osiris-rex.html

OSIRIS-REx will pluck samples from an **asteroid** and return them to Earth. The samples could help explain our solar system's formation and how life began.

[Videos of 'asteroid mission'](#) by www.nasa.gov



[NASA | OSIRIS-REx...](#)

7/17/2013



[Orion Parachute Test July...](#)

7/8/2013



[Media View Ongoing Orion...](#)

7/8/2013



[NASA Announces Asteroid...](#)

7/8/2013

Recent tweets for 'asteroid mission' by www.nasa.gov



NASA @nasa

Data from NASA's @WISE_Mission have led to a new and improved family tree for **asteroids!** go.nasa.gov/16qtQnd

2 months ago

NASA @nasa

RT @Lori_Garver: NASA is developing solar electric propulsion to help send astronauts to an **asteroid** & then Mars; @NASAGlenn is doing **mission critical** work

3 months ago



News & Media Resources

All NASA Missions

2014 Budget Proposal



NASA's FY2014 budget proposal includes a plan to robotically capture a small near-Earth asteroid and redirect it safely to a stable orbit in the Earth-moon system where astronauts can visit and explore it.

[View Site](#)

FY2014 Asteroid Strategy



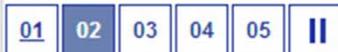
Associate Administrator Robert Lightfoot's Presentation on Asteroid



NASA Announces Asteroid Grand Challenge

NASA announced on June 18 a Grand Challenge focused on finding all asteroid threats to human populations and knowing what to do about them.

[Read More](#)



Asteroid Redirect Images

The Engine Burns Blue



This image shows a cutting-edge solar-electric propulsion thruster in development at NASA's Jet Propulsion Laboratory, Pasadena,

First [1](#) [2](#) [3](#) [4](#) [5](#) Last

NASA Completes First Internal Review of Concepts for Asteroid Redirect Mission

07.31.13 - NASA has completed the first step toward a mission to find and capture a near-Earth asteroid, redirect it to a stable lunar orbit and send humans to s ...

First [1](#) [2](#) [3](#) [4](#) [5](#) Last

Related Documents

ASTEROID INITIATIVE Related Documents



Request for Information, presentations, and technical references related to the Asteroid Redirect Mission and the Grand Challenge.



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Connect



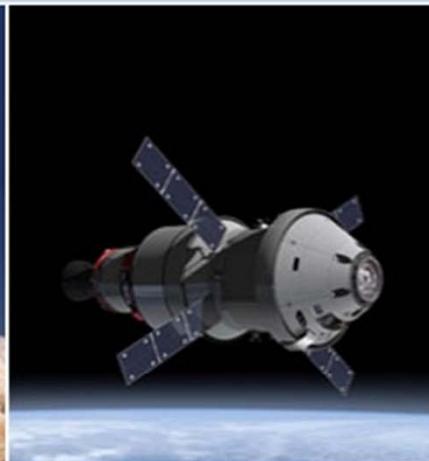
Stay connected with NASA's human exploration activities in and beyond low-Earth orbit.
[View Site](#)

Beyond Earth

Expanding Human Presence into the Solar System



Featured Stories



First Mission of Space Launch System with Orion Atop it to Preview Asteroid Visit

NASA's HEO Mission Directorate initiated a request to change the mission plan for the first flight of the Space Launch System.

[Read More](#)



[View Archive](#)

Exploration at NASA



NASA is developing a first-ever mission to identify, robotically capture and redirect a small asteroid into a stable orbit in the lunar vicinity where humans can visit it.

[Learn more about the initiative](#)



Education and Public Outreach (EPO) Activities Under Sequestration



- Guidance issued by NASA Chief of Staff and Chief Financial Officer March 22, 2013 regarding EPO Activities Under Sequestration
 - Suspended EPO activities pending further review
 - Established waiver process for activities for remainder of FY2013
- Mission Directorates and Centers submitted 834 waiver requests for Communications activities scheduled during the period March 23 – September 30, 2013
 - Approved: 483
 - Conditionally approved: 167
 - Denied: 126
 - Out of scope (no need for approval/denial): 27
 - Withdrawn/deferred/other: 31

EPO Activities Under Sequestration – Outcomes and Observations



Outcomes

- Facilitated dialogue within Communications Coordinating Council and the EPO community at large regarding value and return on investment of planned activities
 - Venue to focus and leverage activities and investments through improved coordination across organizations
 - Opened the door for better alignment of activities with Agency priorities
- Provided an appropriate level of insight into activities and proposed investments
- Accelerated CCC efforts to assemble an Agency-wide Communications portfolio

Observations

- Portfolio of activities demonstrates depth and breadth of connection to and interaction with stakeholders, including the general public
- Multiplicity of Communications activities and products exists, resulting from individual program and project (mission) investments
 - Portfolio includes a large array of public outreach activities spanning whole of the continuum of interactions and experiences, ranging from presence at events with displays, exhibits, hand-on activities, to full citizen science activities where public is contributing to our work
 - Significant investments associated with maintaining a large set of web activities
 - Products generally represent program elements, but not the whole of NASA

EPO Activities Under Sequestration – Strategic Issues



EPO activity review affirmed the following needs:

- Further analysis of our public web presence toward moving to a more strategic and effective model
 - Working Group to be convened tasked with study and recommendations
- A more coordinated methodology for multimedia product planning, development and deployment
 - Multimedia Editorial Board will be established to begin the process
- A strategic approach to NASA's presence at large-scale events and conferences
 - Large Scale Events and Exhibits Working Group has been formed and is developing FY14 plan
- Evaluation of publications and materials to determine the need for Agency-level products and the means to implement a more unified and coordinated approach
 - Small team will be formed to move forward



EdGCM: Educational Global Climate Modeling

EdGCM: Educational Global Climate Modeling



Tools for Training the Climate Change Generation

Mark Chandler

Linda Sohl

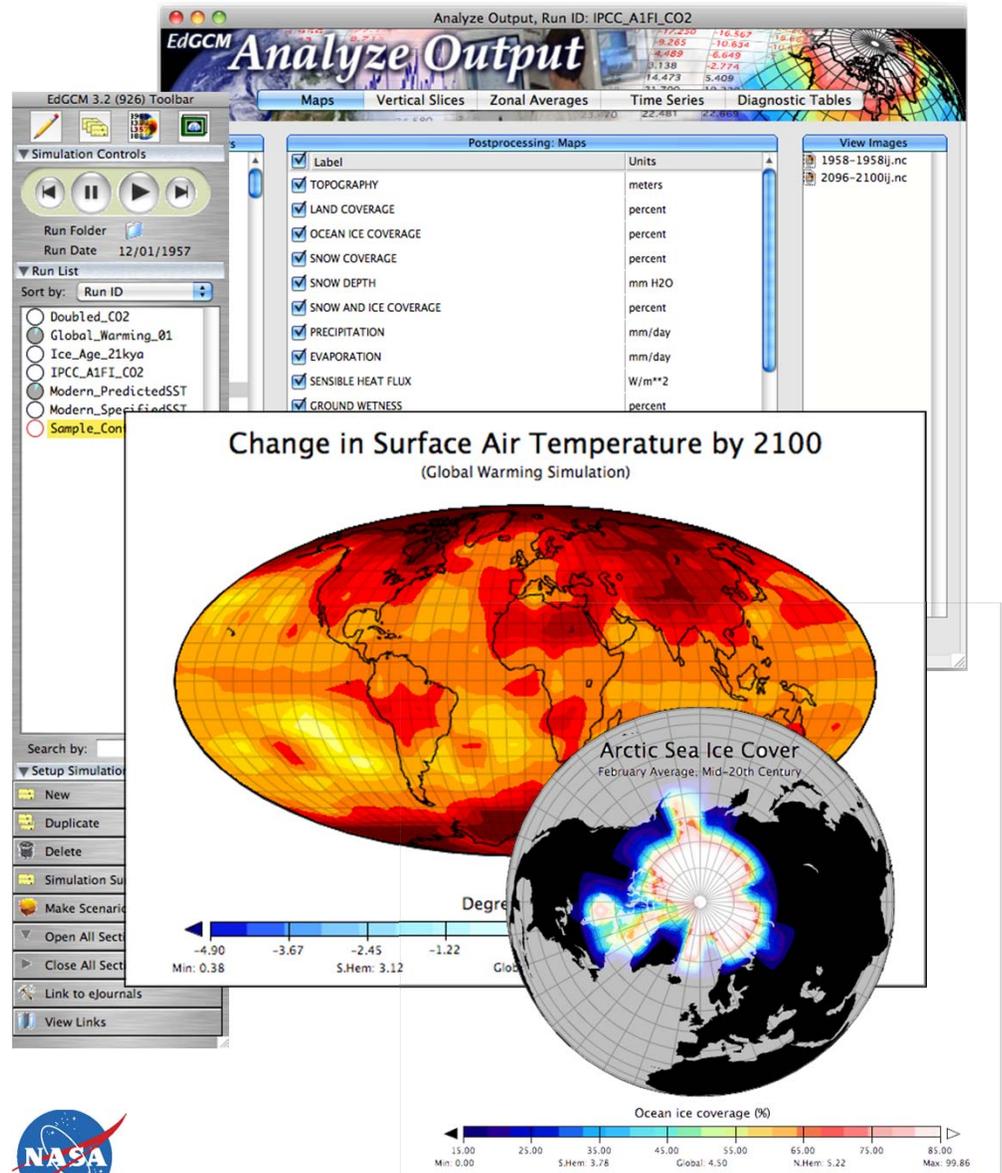
NASA Goddard Institute for Space Studies
at Columbia University

July 30, 2013





- Run a real NASA climate model
- Create your own simulations
- Make maps and plots
- Hundreds of climate variables
- Past or Future climates
- Mac or PC
- <http://edgcm.columbia.edu>





Computing Resources and Climate Models

8°x10°

Rule of thumb:
10X more CPU
sampling of

IPCC



4°x5°

2001, 2007
IPCC AR3, AR4

2014
IPCC AR5

Education Partnerships



University of Wisconsin – Madison
Department of Atmospheric and Oceanic Sciences
Geography Department



Southern University (and LSU) – Baton Rouge, LA
Urban Forestry Program



Dickinson College
Community College Teacher Professional
Development

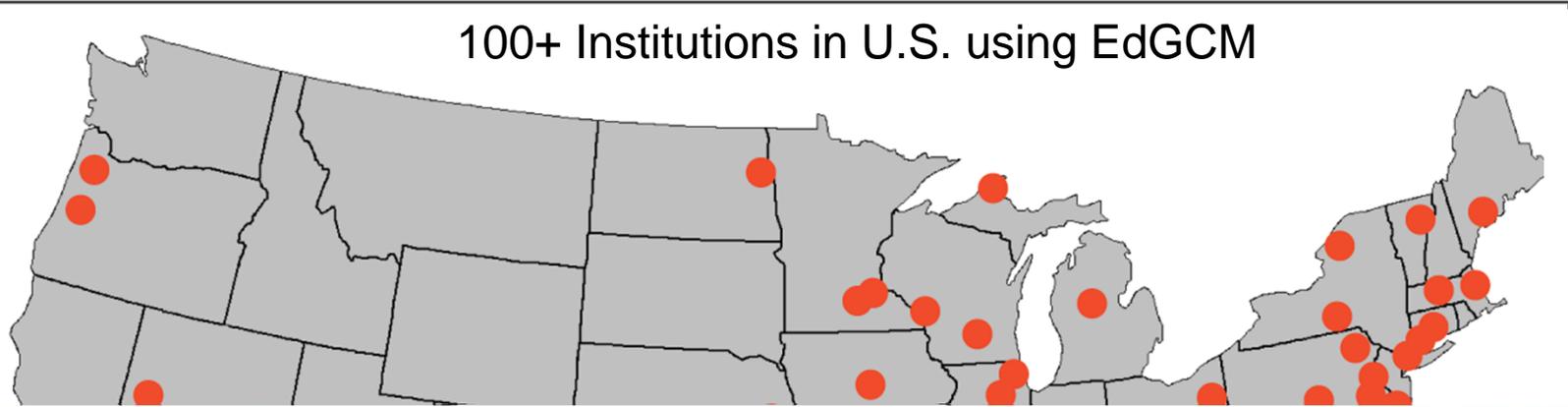


American Museum of Natural History
Seminars in Science, Continuing Education
Programs



Columbia University, New York, NY Macalester College, St. Paul, MN Madison East High School,
 University of Wisconsin - Madison Clarkson University, Potsdam, NY Madison,
 Rutgers University, Newark, NJ Indiana University Southeast, New Memorial High School, Mar

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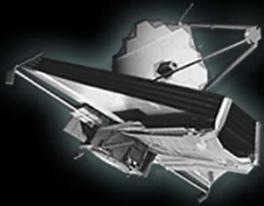
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 nmu

Houghton, MI

Forks, ND

Florida Institute of Technol





STScI'S Office of EDUCATION and PUBLIC OUTREACH

Jason Kalirai, JWST Project Scientist, STScI

Hussein Jirdeh, Head of Communications and Public Outreach, STScI

Kathryn Flanagan, Deputy Director, STScI



Public Impact after SM4

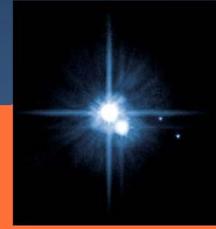
Hubble in the News

Number of impressions = Number of stories x circulation

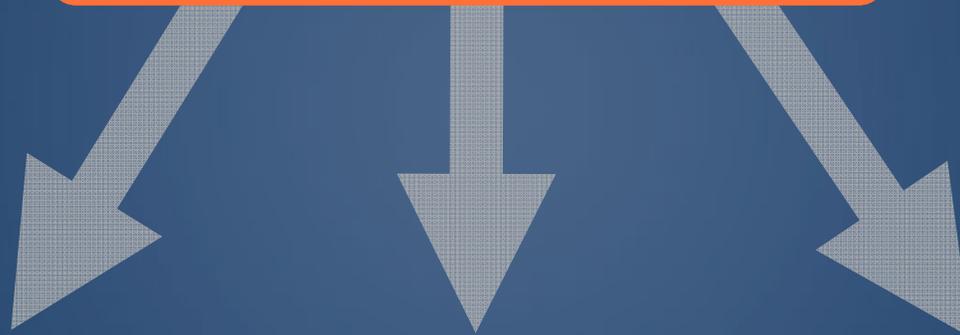


Science is the new Space Frontier

News of Discoveries Reaches Students



Science Discovery



News

Education
Formal
Informal

Public
Outreach

NEWS AND PUBLIC AFFAIRS

News of Hubble's discoveries

For 2012:

- 28 News Releases
- 3,261 online articles with total circulation ~ 4 billion*
- The average news release is exposed to 135 million potential readers



* Meltwater News

ONLINE OUTREACH

- 2 million visits/month
- 150 million hits/month
- Inbox Astronomy
~40,000 subscribers
- 160 questions/month
- HubbleSite is 10%
of NASA's online traffic



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The screenshot shows the Citizen Science website interface. At the top is the 'citizen science' logo. Below it is a section titled 'FIND PROJECTS WHERE YOU CAN PARTICIPATE IN SPACE DISCOVERIES' with a sub-header 'Get involved in the research and participate with the teams analyzing space data.' This section includes text about the number of active projects and a link to the Mikulski Archive for Space Telescopes (MAST). To the right is a 'Planet Hunters' section with a banner for 'planethunters.org' and text describing the project's goal of finding planets around other stars. Below that is 'The Andromeda Project' section. At the bottom, there are three smaller sections: 'Galaxy Zoo: Hubble' with an image of the Hubble Space Telescope, 'A CURIOUS MIND' with a link to 'READ THE BLOG (external link)', and 'Hubble's scientific achievements' with a list of topics including Extrasolar Planets, Dark energy, Hubble Deep Field, Hubble Essentials, Servicing Missions, and Nuts and Bolts. A final box on the right encourages visiting 'Amazing Space' for classroom tools.

ONLINE OUTREACH

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- 150 million hits/month
- Inbox Astronomy
- ~40,000 subscribers
- 160 questions/month
- HubbleSite is 10% of NASA's online traffic



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HUBBLESITE

Home NewsCenter Gallery Hubble Discoveries Hubble Telescope

Education & Museums

HUBBLE'S UNIVERSE unfiltered
with Dr. Frank Summers
The wonders of the universe, explained for you!

GO TO THE PAGE

NewsCenter ▶
Latest news
Hubble Finds Dead Stars, Puffed
with Planet Gases

Want more?
Visit the archive

Webb Telescope ▶
• Behind the Webb (video podcast)
• Technology at the Extremes

The Webb Space telescope, Hubble's successor, will see in Infrared, the light emitted by the farthest objects we can detect. Learn about Webb, its technology, and the science it will reveal.

EDUCATORS
Get the latest astronomy tools for your classroom. Visit our sister-site, [Amazing Space](#).

iBooks are here!
Available on the iBookstore
GET THE iBOOKS

HubbleSite App
Available on the App Store

A CURIOUS MIND
For more science musings
READ THE BLOG (external link)

Gallery ▶
Spectacular pictures of stars, galaxies, nebulae and more. Catch the best of Hubble's extensive portfolio.

Explore Gallery:
• Picture Album
• Wallpaper
• Astronomy Printshop
• Behind the Pictures

Get Involved! ▶
Explore opportunities to collaborate with experts, contribute your time and talents, or just have fun.

• Hubble Hangouts
• Citizen Science
• Hubble Image Processors

Hubble in Action

The Discoveries ▶
Hubble's scientific achievements
• Extrasolar Planets
• Dark energy
• Hubble Deep Field

The Telescope ▶
How it operates and what it can do
• Hubble Essentials
• Servicing Missions
• Nuts and Bolts

ONLINE OUTREACH

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- 150 million hits/month
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Education & MUSEUMS

Bring the marvels of the universe to your classroom or audience. Our sister sites provide a multitude of resources for use in schools, museums, science centers and planetariums.

iBooks are here!

Available on the **iBookstore**

GET THE IBOOKS

AMAZING SPACE ▶▶
resources for teachers and students

The Amazing Space Web site draws on revelations from the Hubble Space Telescope to create materials and online products that teachers can use to reach students in grades K-12. Students can use the site to research homework assignments, project ideas and more.

Online Explorations: Web-based activities that tackle topics from comets to black holes. Construct a galaxy, plan a NASA mission, learn the history of the telescope, and more.

The Star Witness News: This newspaper brings you the latest from the Hubble Space Telescope with easy-to-understand language, graphics and illustrations.

Teaching Tools: A complete listing of all Amazing Space's activities, along with descriptions, related materials, and directions for using them in the classroom.

AMAZING SPACE

Hand-Held Hubble ▶▶

Need a **SCIENCE FAIR** idea?

Create your own scale model of the Hubble Space Telescope!

HUBBLESOURCE ▶▶
resources for museums and planetariums

Find Hubble-themed exhibits, video, images, film and expertise for museums, planetariums, science centers or similar venues.

ViewSpace: Transform a corner of your exhibit hall into an ever-changing kaleidoscope of astronomy presentations. Learn about our internet-fed, self-updating exhibit, ViewSpace.

Available on the **App Store**

A CURIOUS MIND
For more science musings

READ THE BLOG
(external link)

experts, contribute your time and talents, or just have fun.

- **Citizen Science**
- **Hubble Image Processors**

Hubble in Action

The Discoveries ▶
Hubble's scientific achievements

- **Extrasolar Planets**
- **Dark energy**
- **Hubble Deep Field**

The Telescope ▶
How it operates and what it can do

- **Hubble Essentials**
- **Servicing Missions**
- **Nuts and Bolts**

The Webb Space Telescope, Hubble's successor, will see in infrared, the light emitted by the farthest objects we can detect. Learn about Webb, its technology, and the science it will reveal.

EDUCATORS

Get the latest astronomy tools for your classroom. Visit our sister-site, **Amazing Space**.

STScI EDUCATION PROGRAM

We bring the universe to the formal and informal education communities, and engage educators and students in the adventure of scientific discovery.



Standards-based Curriculum Support Tools

(online, hardcopy, and mobile platform)



Professional Development



Student Activities



Exhibits and Standards-based Exhibit Support Materials



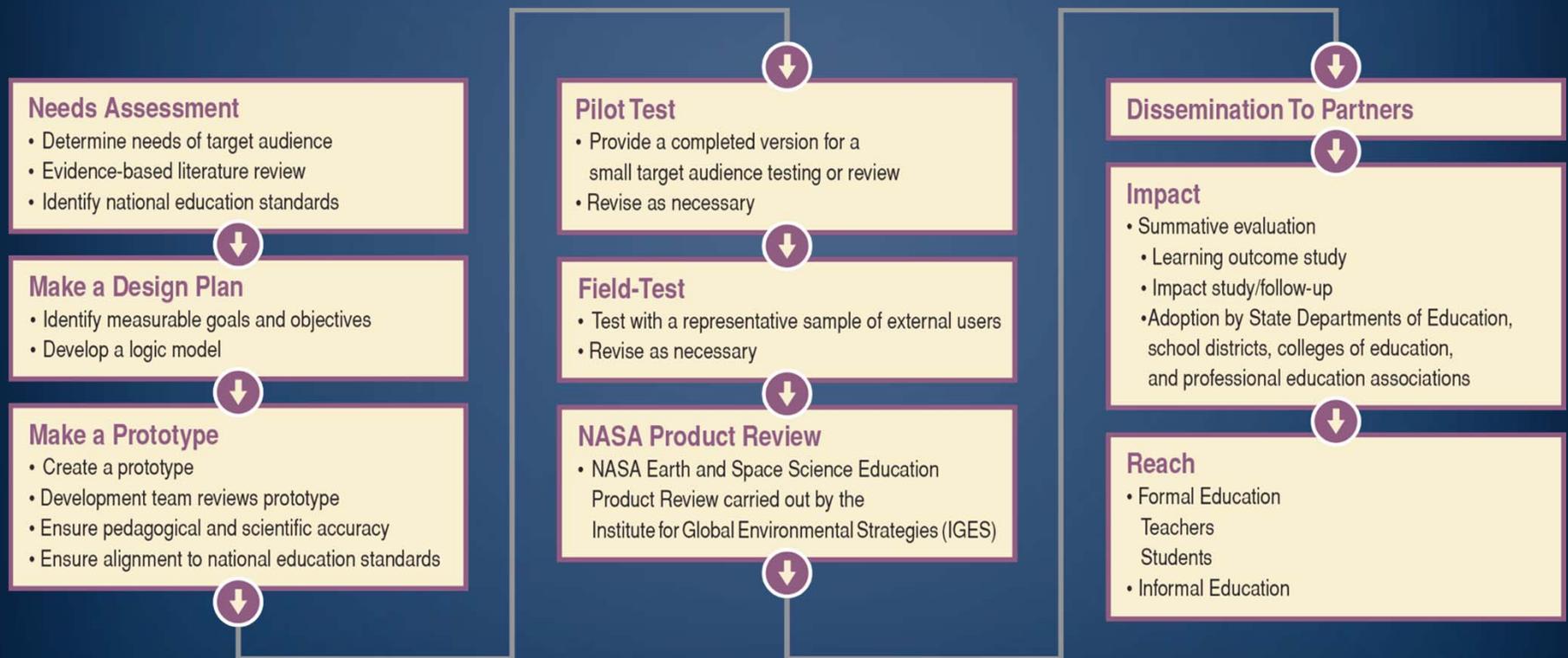
Interns Externs



Education Community Support & Community Events

Unique Content, Educator-Scientist Teams, Research-based, Evaluation (internal/external), Partnerships, Diversity

Every product is standards-based, field-tested and evaluated for impact



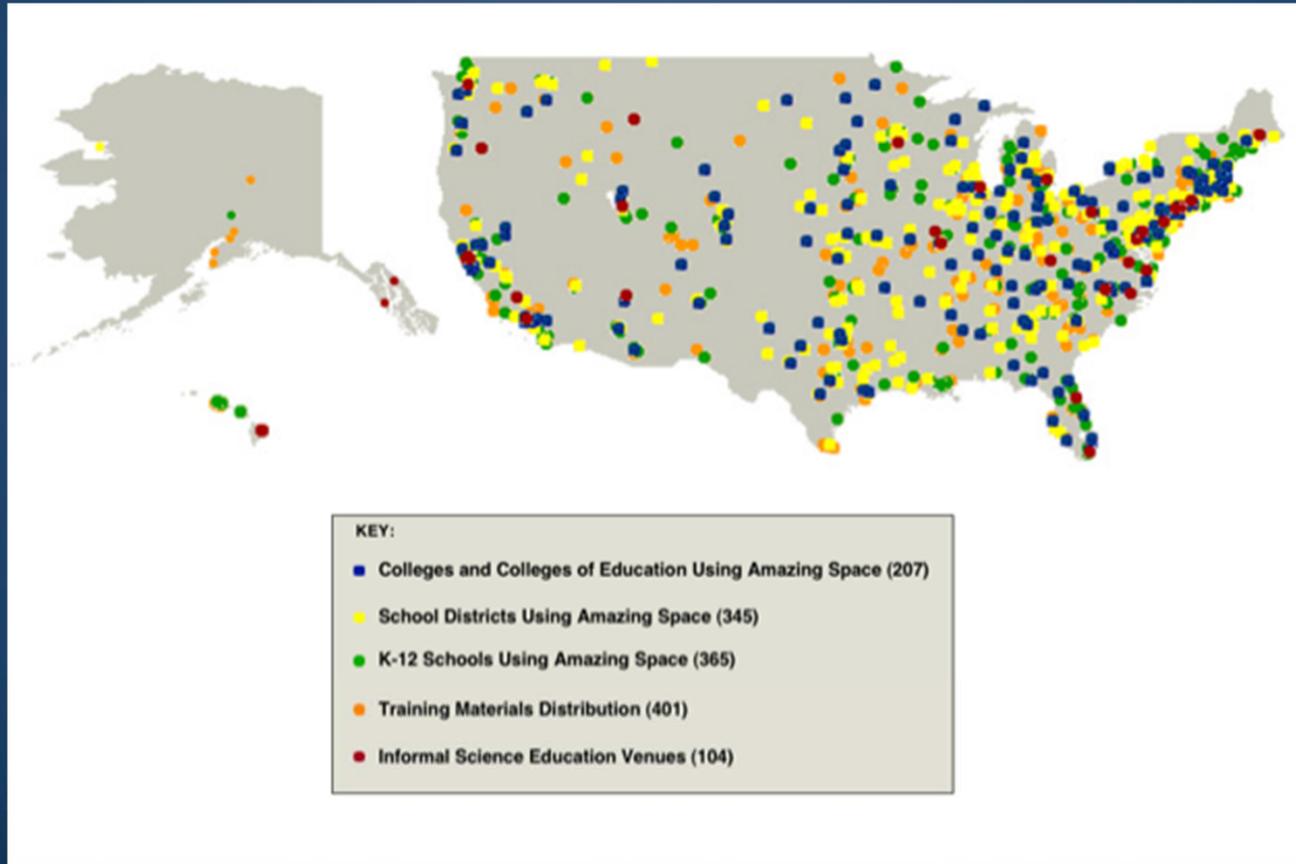
examples of strategic partnerships and reach (How a small team serves a BIG COUNTRY)

textbooks / curriculum
Houghton Mifflin
Lawrence Hall of Science
NSTA
SciGuides
Brooks/Cole
McGraw-Hill
National Federation of the Blind
Chicago State University
Georgia State University
California State University, Sacramento
Penn State University
Virginia Tech University
Immaculata University
Diversity
Morgan State
Baltimore City After School Institute
Women's Collaborative Project
Tactile Astro
STEMcx

State Depts.
Of Education
Ohio, Texas, Utah,
South Carolina, Colorado, Hawaii,
California
Adopted in 27 states, but used in all 50.

ONGOING IMPACT STUDIES

Ongoing education impact study at 1400 venues - a small subset of users - confirms our materials are useful and effective



SUMMARY OF STScI METRICS

FORMAL EDUCATION—½ million teachers, 6 million students per year at a cost of 25¢ per student per year

STScI Formal Education	Metric	Leverage
K-12 students: Direct Interactions	2,000	
K-12 Teachers: Direct Interactions	1,100	Through Master Teachers, a further 55,000 teachers and 1.7 million students reached
K-12 engaged *	6.7 million	Materials used in all 50 states , integrated into programs of more than half the U.S. state departments of education
K-12 teachers engaged	520,000	STScI's Amazing Space website is integrated into Ohio's required pre-service educator training program, reaching over 20,000 educators .

INFORMAL EDUCATION (e.g., museums, libraries) – 9 million people per year

STScI Informal Education	Metric	Measurement Example
Participants/Observers	9 million	Preliminary result by Cornerstone Evaluation Associates LLC of library program measured ~30% increase in astronomy book check out rates

SUMMARY OF STScI METRICS

PUBLIC OUTREACH – 24 million people per year

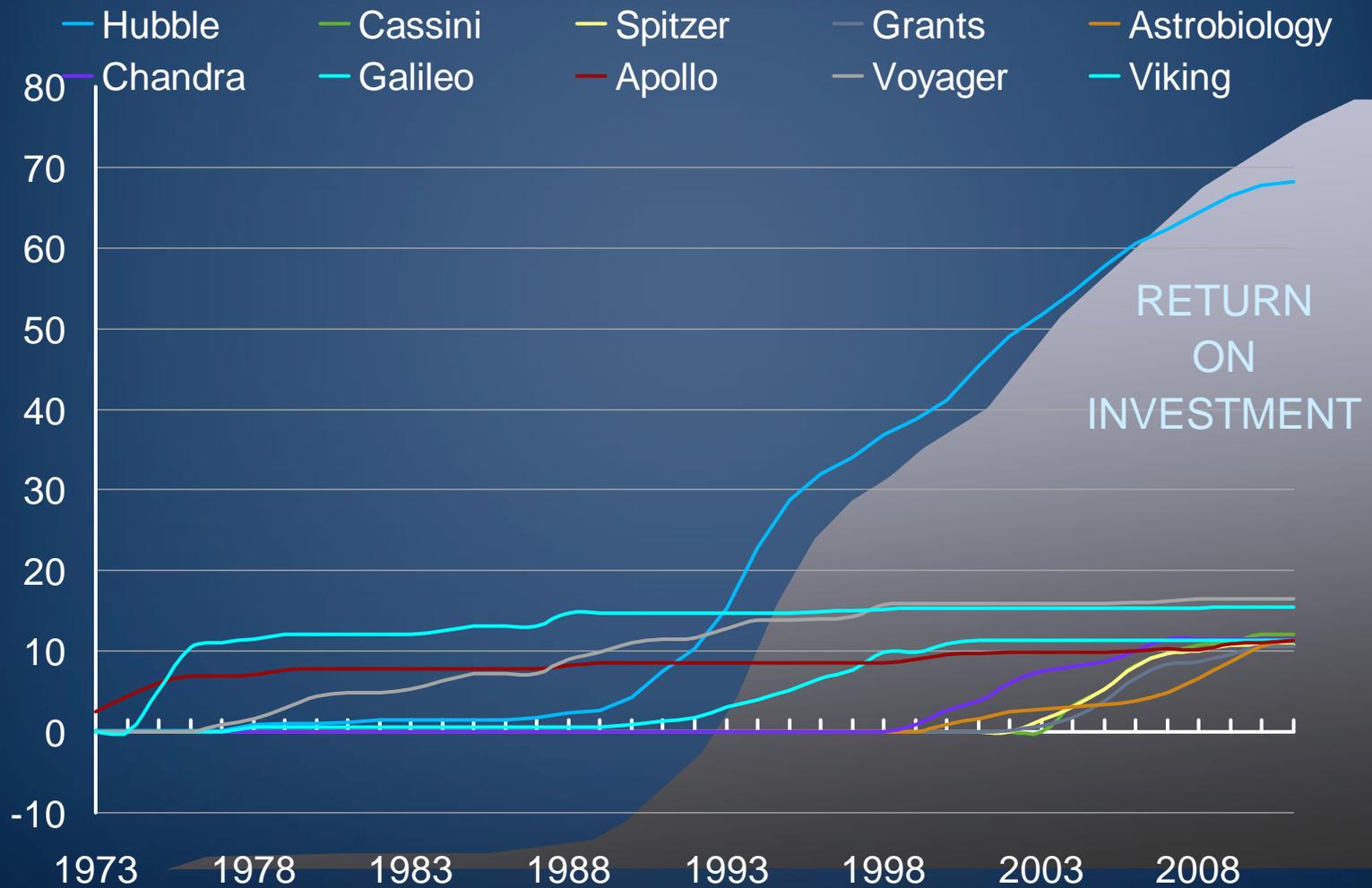
STScI Public Outreach	Metric	Measurement Example
Outreach: Direct Interactions	46,000	
Outreach	24 million	HubbleSite receives 2 million visits per month (10% of NASA's online traffic)

NEWS – over 100 million potential readers every two weeks

STScI NEWS	Metric	Reach metric	Circulation
Outreach: Direct Interactions	28 per year	Average circulation per release	140 million
Outreach	3,300 per year	Total circulation per year	3.8 billion

Public Impact: 1973- 2010 "Davidson" metric

NASA contributions to worldwide scientific discovery and technological achievement



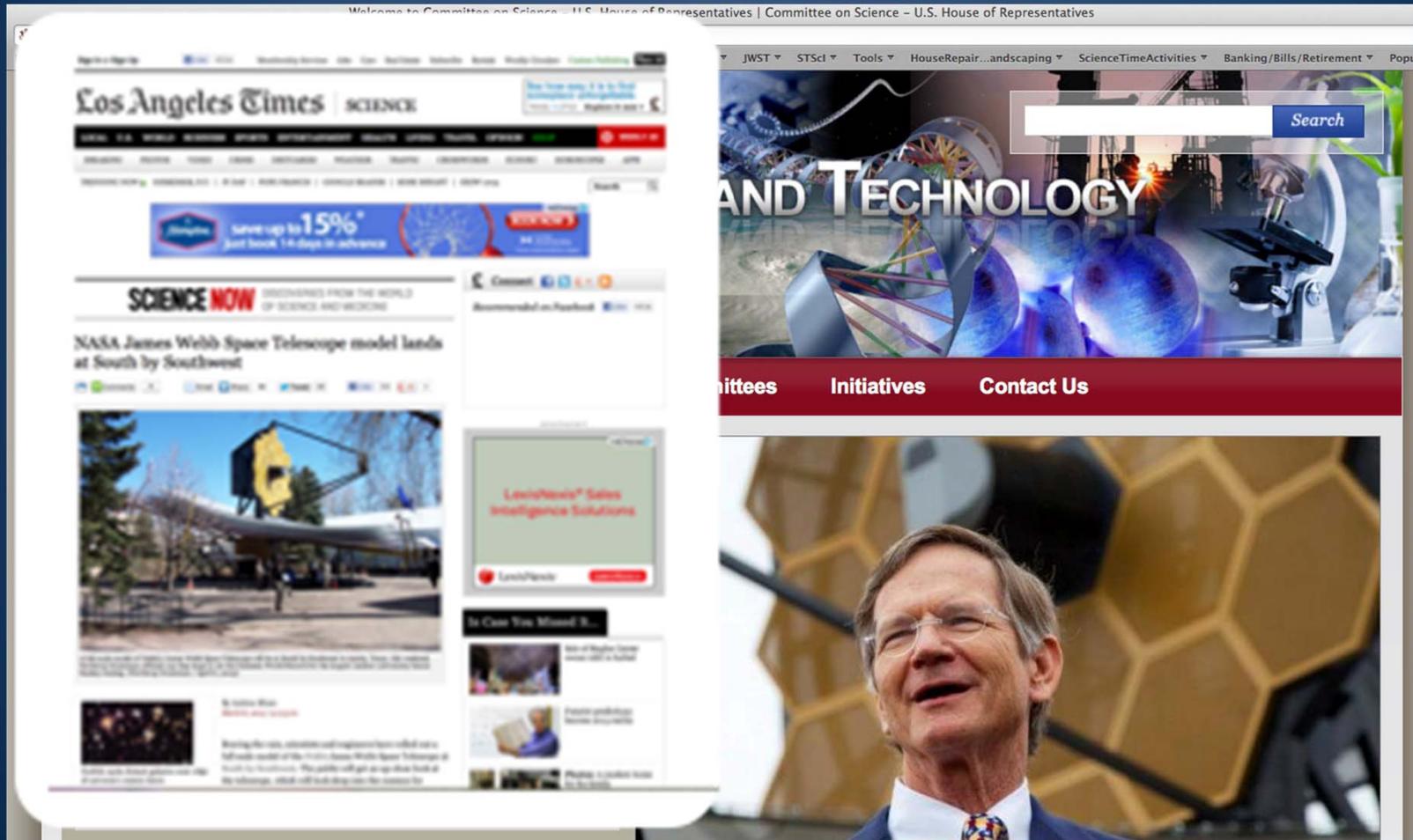
JWST & STEM

On the Brink of a Remarkable Opportunity for
NASA



JWST AT SXSW

15,000 visitors in 3 days – 40+ media stories



NASA Internal Memo: Guidance for Education and Public Outreach Activities Under Sequestration

"Effective immediately, all education and public outreach activities should be suspended, pending further review. In terms of scope, this includes all public engagement and outreach events, programs, activities, and products developed and implemented by Headquarters, Mission Directorates, and Centers across the Agency, including all education and public outreach efforts conducted by programs and projects.

The scope comprises activities intended to communicate, connect with, and engage a wide and diverse set of audiences to raise awareness and involvement in NASA, its goals, missions and programs, and to develop an appreciation for, exposure to, and involvement in STEM. Audiences include employees, partners, educators, students, and members of the general public. The scope encompasses, but is not limited to:

- Programs, events, and workshops.
- Permanent and traveling exhibits, signage, and other materials.
- Speeches, presentations, and appearances, with the exception of technical presentations by researchers at scientific and technical symposia.
- Video and multimedia products in development (and renewal of existing products).
- Web and social media sites in development (excludes operational sites).
- External and internal publications, with the exception of Scientific and Technical Information as defined by NPD 2200.1B.
- Any other activity whose goal is to reach out to external and internal stakeholders and the public concerning NASA, its programs, and activities."

March 22, 2013



Coordination of EPO Activities

▶ Recommendation

- ▶ NASA should learn from the approval process begun during sequestration and develop a new process that efficiently coordinates with missions, aligns EPO programs with NASA goals, and is cost-effective.

▶ Reason

- ▶ Fragmented and non-aligned EPO activities dilute the effectiveness and reach of these programs, and undermine NASA's overall strategic EPO objectives.

▶ Consequences of No Action

- ▶ Continuing development of duplicative and potentially inefficient EPO programs, which are not aligned with the agency's strategic priorities, make the cost-benefits harder to evaluate and defend.



Use of Mission Directorate EPO Resources

▶ Recommendation

- ▶ To the extent that missions have funding for EPO activities, they should coordinate with Mission Directorates' EPO and utilize the most cost effective resources to accomplish such activities - be they inside NASA or out.

▶ Reason

- ▶ Missions and their parent Mission Directorates often create EPO capabilities and products that overlap. While this diversity can be a plus, it can also be less cost-effective and produce EPO products and activities that are not consistent with overall Mission Directorates' and NASA objectives.

▶ Consequences of No Action

- ▶ Duplicative and potentially inefficient EPO programs are developed that fail to leverage best practices and past lessons learned, leading to higher costs, and confusing public messaging.



Citizen Engagement

▶ Recommendation

- ▶ NASA plays a unique role in the inspiration and education of the public about programs in space and has a stellar track record. While the Council acknowledges that efficiencies may be gained through consolidation, The Council remains concerned with the proposed transfer of responsibility for outreach associated with NASA space missions to agencies and organizations with no spaceflight experience. NASA should ensure that funding remains in place for public outreach associated with NASA's missions.

▶ Reason

- ▶ NASA , by virtue of its missions, currently plays a unique role in engaging the public in space exploration and exposing them to science and technology. These activities take place outside of the STEM activities which are being consolidated under the FY14 reorganization.

▶ Consequences of No Action

- ▶ A unique and important capability to engage and inspire the public outside of the traditional education system will be lost.



Digital Media Rationalization

▶ Finding

- ▶ NASA's digital multimedia products are not well coordinated amongst MDs, organized consistently for public access, and consistent in supporting NASA's overall strategic vision. We believe that CCC Digital Media Subgroup are on the right path and should work closely with the new CIO to develop a digital media strategy which produces media products that are coordinated, necessary to support NASA's overall vision, and secure.

▶ Reason

- ▶ As an example, NASA runs over 1,800 web sites (by some estimates ~60% of all web sites run by the government), They are not all integrated into the NASA.GOV infrastructure, and some are insecure (security breaches have occurred). There is little or no coordination of these sites at the HQ level, and may be obsolete and therefore incur an unnecessary operational cost burden. They also perpetuate the public confusion about NASA's overall mission.



Web Site Redesign

▶ Finding

- ▶ The Committee finds that the Office of Communication's recent redesign of the NASA.GOV website, while not complete, addresses many concerns the Committee has had regarding usability and information organization. We believe the Office should be recognized for the excellent progress it has made, and look forward to the continuing improvement of NASA's web presence.

▶ Reason

- ▶ Despite its popularity, the prior version of NASA.GOV did not utilize evolving best practices in web design. Proprietary video formats, inability to search social media sources and other relevant content not hosted on the site, scattering of videos across many different sites and accounts, confusing information organization and a dated color palette detracted from the overall quality of the web experience.

