

Education & Public Outreach

Lars Perkins

Chairman

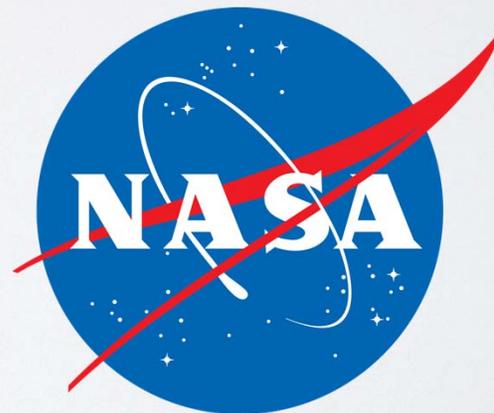
Education and Public Outreach Committee

NASA Advisory Council

12 December 2013

Topics

- ▶ Public Outreach Status
- ▶ Education
 - ▶ Where we are
 - ▶ How we got here
 - ▶ What's next





Richard
Garriott



Dwayne McCay



Michael Bostick



Peter Shankman



Bill
Nye



Pilar Montoya



Scott
Parazynski



Doug King



Matthew Chamberlin



Lars Perkins



Stephen Pearse

The Taxi Driver Problem



Public Outreach

- ▶ Website
- ▶ Press Releases
- ▶ NASA TV
- ▶ FOIA requests

David Weaver, AA

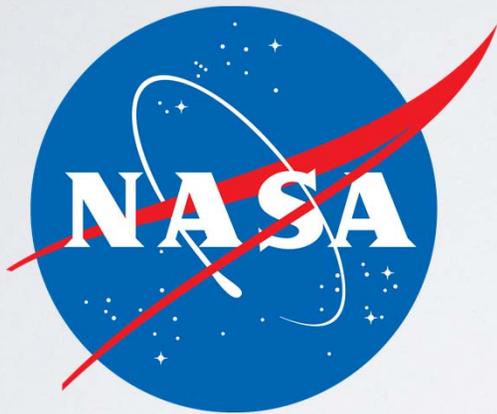
Public Outreach

- ▶ **Single Message to the Public**
 - ▶ Pounded home by all missions, Mission Directorates, Leadership
 - ▶ In every press release, part of every NASA TV presentation.
 - ▶ Repeated by the Administrator in his interactions with the press & public
 - ▶ Website, New Media, Email taglines
 - ▶ Everyone should know it.

What does NASA do?

Current Mission Statement

“NASA exists to reach for new heights and reveal the unknown so that what we do and learn will benefit all humankind.”



**Invent.
Discover.
Explore.**

Recommendation: 2013-01-07 (EPOC-01)

Will.i.am asked a question ...



What does it mean
to “NASA”?

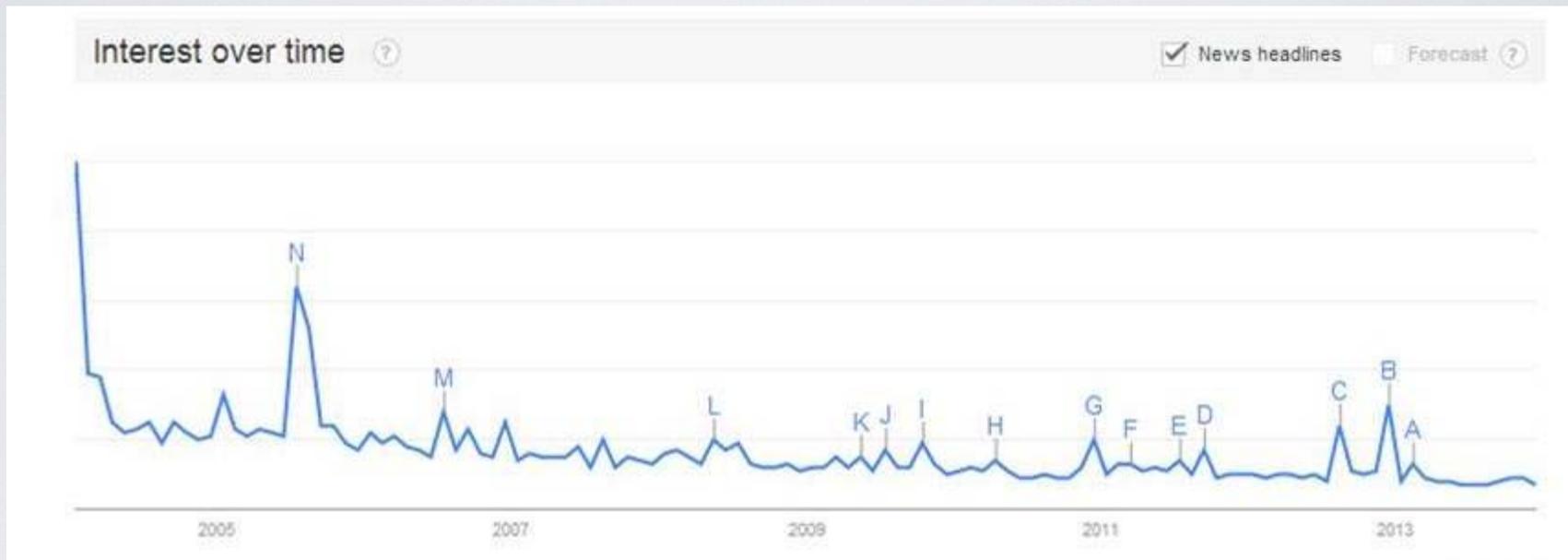
Public Outreach

- ▶ **One message, relentlessly repeated** (recommendation)
 - ▶ Leadership, rather than consensus
- ▶ **Cutting edge online presence, including website revamp, citizen science playground, third party videos, etc.**(recommendation)

Please carry the torch.

Existential crisis?

Google searches for NASA terms over time

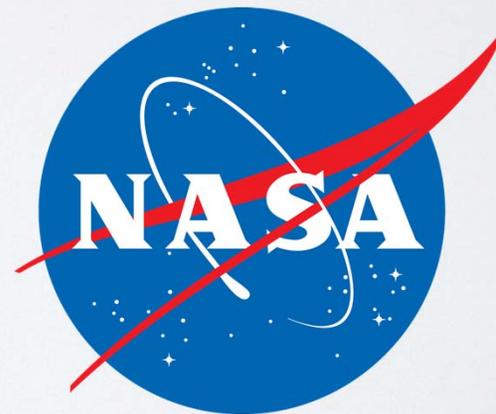


Trend is not good.

EDUCATION

- ▶ Unique
- ▶ Inspirational
- ▶ Years of experience, measurable effective
- ▶ AT-RISK

STEM =



Education Spend

▶ HQ Based Education Initiatives

- ▶ ~200 million ('13)
- ▶ Space Grant
- ▶ EPSCoR
- ▶ MUREP
- ▶ Non-Directed Funds: ~60 million

▶ Mission Directorate Activities

- ▶ ~64 million
- ▶ SMD: \$42 million - largest single line item in non-directed Educational programs

Why Independently run programs?

- ▶ “We know it best”
- ▶ “We want to be in control”
- ▶ “We have learned how to get it done”
- ▶ “We don’t want it swallowed up by bureaucracy”

RESULT: Consciously “stealth” programs with inadequate visibility at HQ, resulting in reduced ability to defend and advocate.

NASA Programs

NASA	LDCM	0.14	0.54	0.30	0.68	Broader STEM	Pre- & In-Service Educator Performance	Yes
NASA	HST	1.42	1.35	1.25	1.29	Broader STEM	Learning	Yes
NASA	Cassini	1.55	1.70	1.65	1.26	Broader STEM	Learning	Yes
NASA	Aqua	-	0.48	0.43	0.44	Broader STEM	Engagement	No
NASA	GCCE - Global Climate Change Education	7.00	10.00	10.00	3.50	Broader STEM	Learning	Yes
NASA	Astrophysics Forum	-	0.99	1.00	1.02	Broader STEM	Institutional Capacity	Yes
NASA	Heliophysics	-	0.82	0.73	0.79	Broader STEM	Institutional Capacity	Yes
NASA	Planetary Science E/PO Forum	-	0.92	0.89	0.87	Broader STEM	Institutional Capacity	Yes
NASA	Earth Science E/PO Forum	-	0.76	0.87	0.89	Broader STEM	Institutional Capacity	Yes
NASA	Chandra	1.92	1.85	1.82	1.77	Broader STEM	Engagement	No
NASA	LTP - Learning Technologies Project	1.28	0.84	0.71	0.54	Broader STEM	Education R & D	No
NASA	EPOESS	0.79	4.58	6.91	7.00	Broader STEM	Learning	Yes
NASA	Juno	0.58	1.21	1.31	1.27	Broader STEM	Learning	Yes
NASA	DAWN	0.30	0.27	0.36	0.53	Broader STEM	Learning	Yes

Agency	Investment	FY 08	FY 09	FY 10	FY 11	Type	Primary Objective	Under-represented Groups
NASA	SOFIA (Stratospheric Observatory for Infrared Astronomy) Education and Public Outreach	0.24	0.36	0.60	0.61	Broader STEM	Pre- & In-Service Educator Performance	Yes
NASA	NSTI-MI - NASA Science and Technology Institute for Minority Institutions	2.00	1.96	2.46	2.11	Agency Mission Workforce	Institutional Capacity	Yes
NASA	Space Grant - National Space Grant College and Fellowship Program	39.71	38.30	44.50	45.50	Agency Mission Workforce	Postsecondary STEM Degrees	Yes
NASA	eEducation Small Projects/Central Operation of Resources for Educators (CORE)	0.60	0.49	0.40	0.49	Broader STEM	Pre- & In-Service Educator Performance	Yes
NASA	NETS - NASA Education Technologies Services	1.40	1.30	1.00	0.47	Broader STEM	Learning	Yes
NASA	Curriculum Improvement Partnership Award for the Integration of Research into the Undergraduate Curriculum (CIPAIR)	2.75	2.71	3.11	0.60	Agency Mission Workforce	Postsecondary STEM Degrees	Yes
NASA	University student launch initiative	-	-	-	0.32	Agency Mission	Engagement	Yes

						Workforce	nasa	
NASA	Aeronautics Scholarship	1.80	1.80	1.80	1.60	Agency Mission Workforce	Postsecondary STEM Degrees	No
NASA	Innovation in Aeronautics Instruction Competition	1.10	1.10	1.10	0.46	Agency Mission Workforce	Institutional Capacity	No
NASA	JPFP - Jenkins Pre-Doctoral Fellowship Program	2.56	2.53	2.63	3.40	Agency Mission Workforce	Postsecondary STEM Degrees	Yes
NASA	USRP - Undergraduate Student Research Project	4.00	3.48	2.97	3.30	Agency Mission Workforce	Postsecondary STEM Degrees	No
NASA	EFP - Education Flight Projects	1.20	3.11	2.99	2.70	Broader STEM	Engagement	No
NASA	SEMAA - Science Engineering Mathematics and Aerospace Academy	2.51	1.91	3.09	2.13	Broader STEM	Learning	Yes

Agency	Investment	FY 08	FY 09	FY 10	FY 11	Type	Primary Objective	Under-represented Groups
NASA	SEED - Systems Engineering Educational Discovery	0.29	0.37	0.41	0.30	Agency Mission Workforce	STEM Careers	No
NASA	Reduced Gravity Student Flight Opportunity Project	-	0.36	0.36	0.30	Agency Mission Workforce	Learning	No
NASA	SOI - Summer of Innovation	-	-	10.00	10.10	Broader STEM	Engagement	Yes
NASA	HEOMD Space Grant Project	1.36	1.55	1.03	1.07	Agency Mission Workforce	Postsecondary STEM Degrees	Yes
NASA	NSBRI Higher Education Activities - National Space Biomedical Research Institute	0.72	0.74	0.75	0.65	Agency Mission Workforce	STEM Careers	Yes
NASA	MESSENGER	0.43	0.36	0.30	0.34	Broader STEM	Learning	No
NASA	URC - University Research Centers	13.93	14.57	14.06	10.40	Agency Mission Workforce	Postsecondary STEM Degrees	Yes
NASA	Aura	-	0.38	0.37	0.48	Broader STEM	Learning	No
NASA	GSRP - Graduate Student Researchers Program	5.20	4.30	4.40	3.30	Agency Mission Workforce	STEM Careers	No
NASA	Innovation in Higher Education STEM Education	-	-	0.96	4.70	Agency Mission Workforce	Postsecondary STEM Degrees	No

NASA	AESP - Aerospace Education Services Project	4.90	5.50	2.50	3.90	Broader STEM	Pre- & In-Service Educator Performance	Yes
NASA	Mars E/PO Informal Ed	0.99	0.77	0.81	1.00	Broader STEM	Engagement	No
NASA	Mars E/PO Formal Ed	1.20	1.00	1.30	1.10	Broader STEM	Learning	No
NASA	GLOBE (Learning and Observations to Benefit the Environment) Program		4.40	3.00	5.00	Broader STEM	Engagement	No
NASA	TCUP - NASA Tribal College and University Project	1.62	1.68	1.59	1.50	Agency Mission Workforce	Postsecondary STEM Degrees	Yes

NASA	LEARN - Learning Environment and Research Network	2.40	3.00	3.00	2.70	Broader STEM	Engagement	No
NASA	SIMulation-Based Engineering and Science Teacher Professional Development	-	-	0.39	0.40	Broader STEM	Pre- & In-Service Educator Performance	No
NASA	INSPIRE - Interdisciplinary National Science Program Incorporating Research and Education Experience	2.85	3.42	2.52	3.23	Broader STEM	Engagement	Yes
NASA	LERCIP - Lewis Educational Research Collaborative Internship Project (College)	0.76	0.97	0.90	0.60	Agency Mission Workforce	Postsecondary STEM Degrees	No
NASA	MSP - MUREP Small Projects	1.50	1.80	1.70	1.80	Agency Mission Workforce	Institutional Capacity	Yes
NASA	LARSS - NASA Langley Aerospace Research Student Scholars Program	1.00	1.10	1.30	1.30	Agency Mission Workforce	Postsecondary STEM Degrees	No
NASA	MUST - Motivating Undergraduates in Science and Technology	1.90	1.90	2.40	1.80	Agency Mission Workforce	Postsecondary STEM Degrees	Yes
NASA	CEP - Career Exploration Project	1.16	1.15	1.30	1.20	Agency Mission Workforce	Engagement	Yes
NASA	Space technology research fellowships	-	-	-	7.00	Agency Mission Workforce	Learning	No
NASA	Total	125.33	139.27	155.91	154.07			

- ▶ Like IT, education lacks governance, not ability
- ▶ There is no C(E)O
- ▶ Not viewed as mission critical

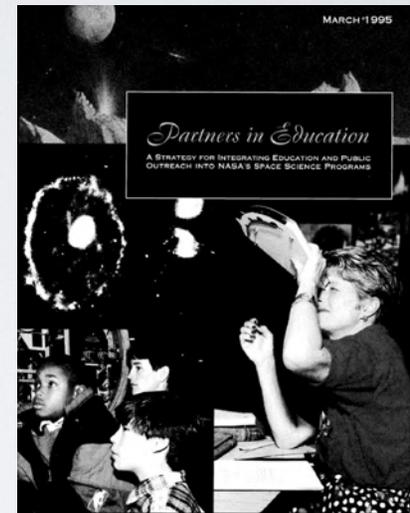


SMD's Unique Approach



20 Years of partnering scientists and educators by embedding EPO programs and funding in its missions and research.

- Scientists and educators work side-by-side to translate cutting-edge NASA science and technology for classrooms, museums, and public venues.



“SMD missions must have an EPO program that is funded with at least 1% of the total prime mission cost excluding launch vehicle.” – SMD Policy Document SPD-18

SMD EPO Leverages a Highly Skilled Community of EPO Practitioners

Choices	Percentage
Informal education experience (museum, park, library, afterschool, etc.)	86.00%
Ph.D. scientist	85.00%
K-12 teaching experience (any grade)	78.00%
Higher education teaching experience	77.00%
Electronic media development/Information technologies experience	77.00%
STEM experience in the private sector	42.00%
preK teaching experience	12.00%

SMD EPO leads have deep, significant experience in NASA STEM: 71% have > 6 years (41% > 10 years)



The James Webb Space Telescope at South by Southwest

SXSW has been the most impactful public outreach event for the JWST mission since the program's start. We presented JWST as Hubble's Successor, and reached a *new, highly engaged audience* through leveraged social media which has resulted in a new and sustained JWST footprint online.

*15,000+ in-person interactions in 3 days
> 4 million impressions on Twitter
> 40+ media stories*

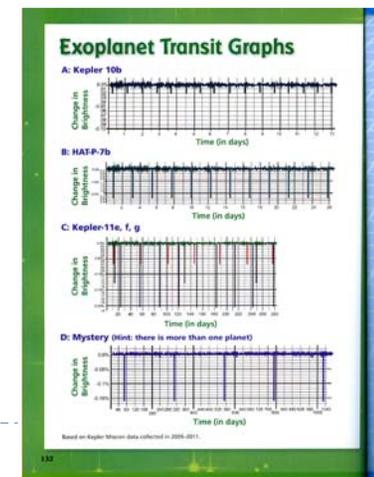
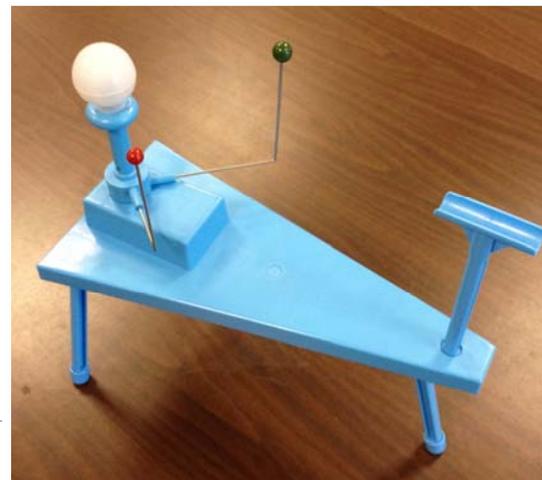
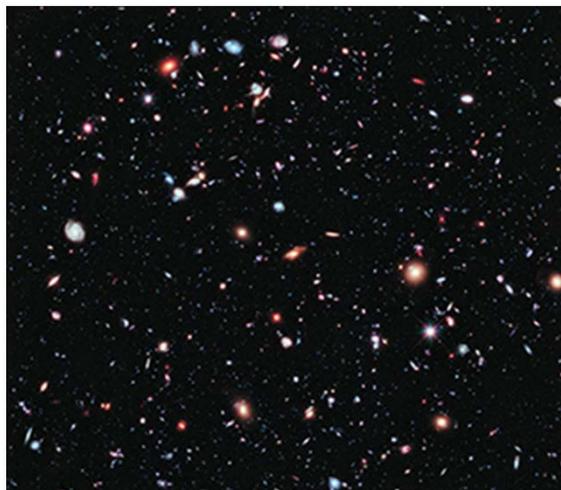


SMD Missions' Unique Education Materials are Incorporated into Classroom



Hubble's **Amazing Space** education materials are *used by an estimated half million teachers and six million students* nationally each year. Materials are used in all 50 states, and *incorporated into more than half of the U.S. state departments of education.*

Kepler exoplanet science is integrated into the Lawrence Hall of Science FOSS curriculum, *adopted in 50 of the 100 largest urban school districts.*



Curiosity

Browser tabs: (3) Lars Perk x, Google x, Google Tren x, columbia ac x, nasa office c x, W Comet Sho x, m-planet - C x, nsf.gov - Exp x, murep - Goc x, Huge Crowc x

Address bar: www.space.com/16950-nasa-mars-rover-landing-times-square.html

Navigation: Apps, Relive, Flying, Forms - Blue Shield ..., (5) Hangouts, Rockcroft - On The ...

Other bookmarks

TRENDING: Comet ISON // Skywatching Guide // Mars Rover Curiosity // Solar Flares // Space Photos // Space Videos // Telescopes for Beginners

Huge Crowds Watched NASA Rover Land on Mars From NYC's Times Square

by SPACE.com Staff | August 06, 2012 03:35pm ET

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Huge Crowds Watch as Department of Education Unveils New Curriculum

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INSPIRATION



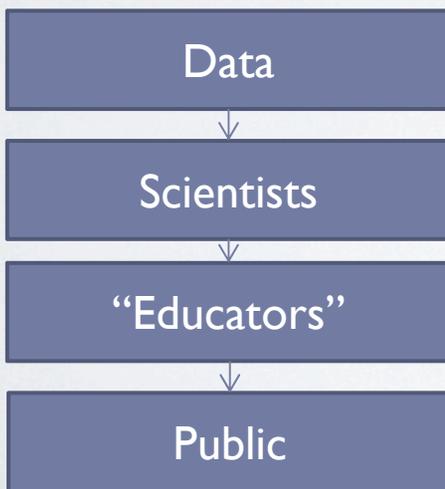
How many were motivated to consider a STEM career? Science can be cool!



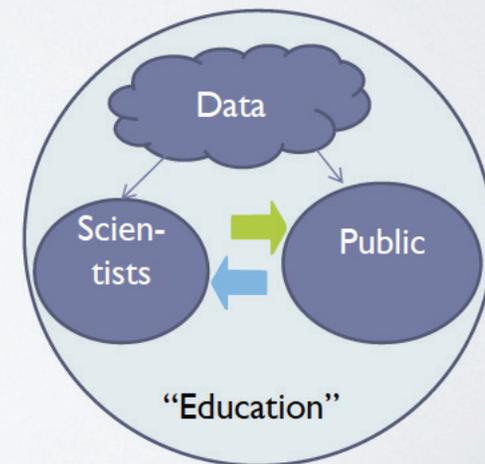
Ex: Mars Exploration Program EPO

- ▶ Since Pathfinder (1997)
- ▶ \$1.5-\$4.5 mm a year
- ▶ “Curiosity has become a new generation’s Apollo”
- ▶ Citizen science is part of the new educational paradigm

OLD



NEW



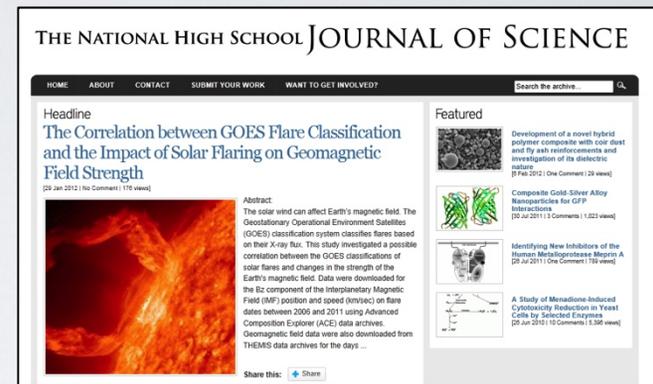
SMD Mission EPO Enables Students and Educators to Participate in the Practice of Science



MY NASA DATA- over 200 classroom-friendly Earth science datasets and tools; 100+ peer reviewed lessons ~80,000 unique visitors annually; 60,000 back links



Science magazine selected the Mars Student Imaging Project as one of the top inquiry-based education modules in the U.S.

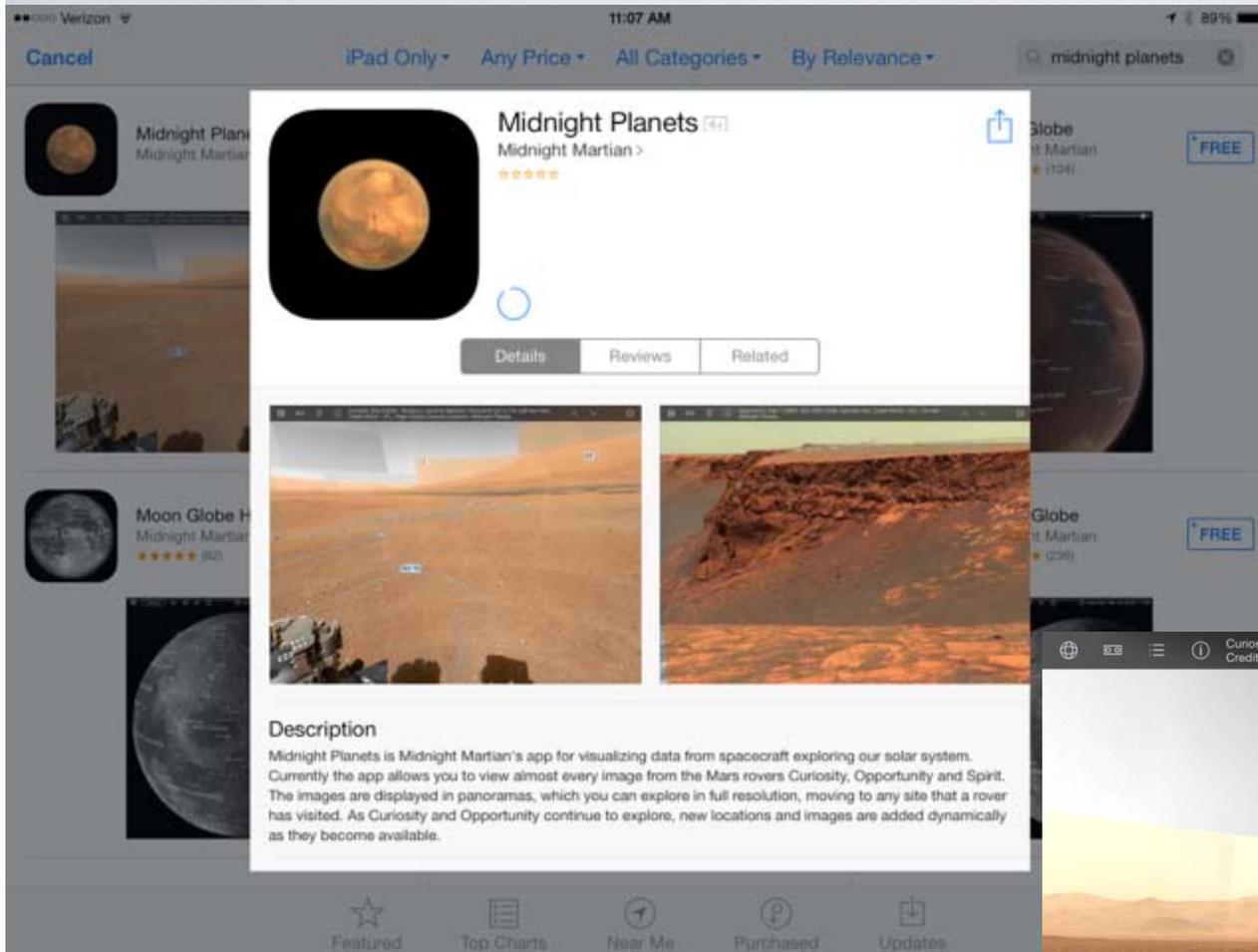


High school student publishes paper about his research using THEMIS data

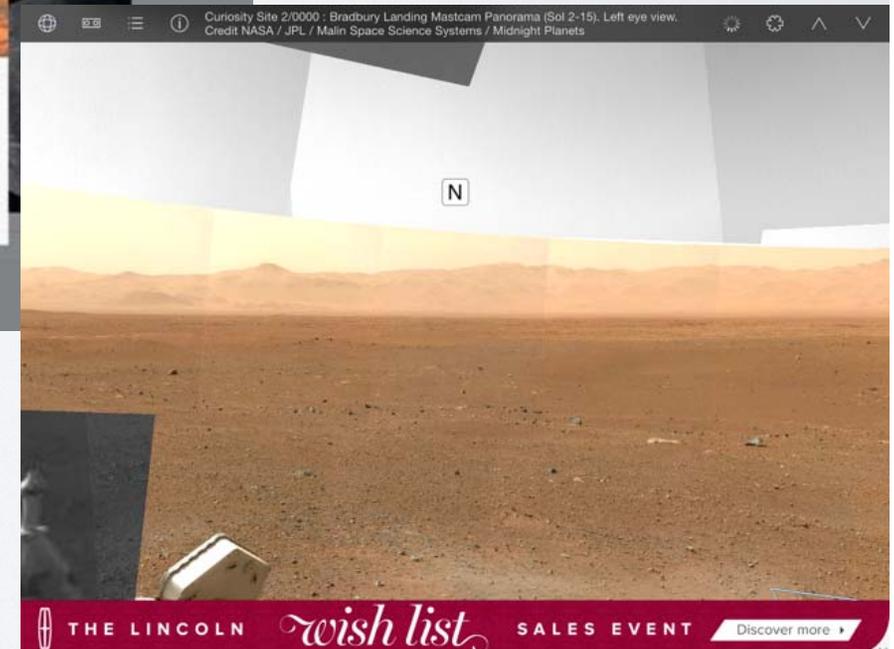


Educators fly side-by-side with scientists on SOFIA

Citizen Science



“Email midnightmartian@gmail.com. Please keep in mind that the guy who does Midnight Martian loves to hear from you (usually) but is very busy making more apps and features.”



curiositylog.com

Curiosity Rover at Gale Crater -- last reported position at 2013 DEC 10 08:47:57 UTC [HOME](#)
Drive log [drive log help](#)

drive	dist, m	duration, min:sec	sol, LMST	UTC	odometer, m	az/roll/pitch	elev, m		
120	6.09	10:17	477 01:57:15pm	2013DEC09 06:53:27	45688	186° +1° +4°	27.37	map	speed plot
119	8.56	33:01	474 01:21:02pm	2013DEC06 04:17:29	45627	204° +0° +6°	27.10	map	speed plot
118	50.45	35:54	472 01:48:26pm	2013DEC04 03:26:27	45742	214° +2° +11°	27.30	map	speed plot
117	80.96	164:25	470 11:09:35am	2013DEC01 23:24:04	45237	238° +0° +0°	26.12	map	speed plot
116	52.88	68:15	465 12:43:50pm	2013NOV26 21:42:58	44426	206° -2° +2°	24.08	map	speed plot
115	88.41	200:33	455 11:16:25am	2013NOV16 13:37:16	43696	140° +0° +0°	23.91	map	speed plot
114	104.07	149:34	454 11:07:04am	2013NOV15 12:48:04	43015	276° +0° +4°	23.73	map	speed plot
113	49.70	123:15	453 11:58:42am	2013NOV14 13:01:32	41974	225° -5° +2°	23.30	map	speed plot
112	5.18	12:40	440 01:46:25pm	2013NOV01 06:17:35	41477	195° -6° +10°	20.98	map	speed plot
111	26.89	47:25	439 02:05:44pm	2013OCT31 05:57:51	41425	220° +0° +2°	20.66	map	speed plot
110	54.05	72:52	438 12:21:41pm	2013OCT30 03:31:21	41159	249° -6° +3°	21.33	map	speed plot

Curiosity Rover at Gale Crater -- last reported position at 2013 DEC 10 08:47:57 UTC [HOME](#)
duration 10.28 minutes, sol 477 01:57:15 P.M. (2013 DEC 09)

University of Arizona, OpenLayers tiles by MapTiler/GDAL2Tiles, Klekan Petr Fridal, GDAL & OSGeo

Base Layer
 Google Mars

Overlays
 CTX
 HiRISE
 Track
 Drive 120
 Markers

137.40505, -4.62824



www.spaceflight101.com/msl.html



Curiosity MSL

Photo: NASA JPL / Caltech

Links

- >>> Mission Updates
- >>> Science Reports
- Downloads
- Gallery
- Video Gallery
- MSL Spacecraft Information
- MSL Rover Information
- Mission Progress and Timeline

MSL Mission Elapsed Time

DAY	HR	MIN	SEC
007	46	16	22:04

Mission Coverage

Tweets

MSL Curiosity 10 Dec

Patrick Blau

New York Times

www.nytimes.com/interactive/science/space/mars-curiosity-rover-tracker.html?_r=1&

Space & Cosmos

THERMOBALL PROVIDES ULTRALIGHT WARMTH IN ALL CONDITIONS

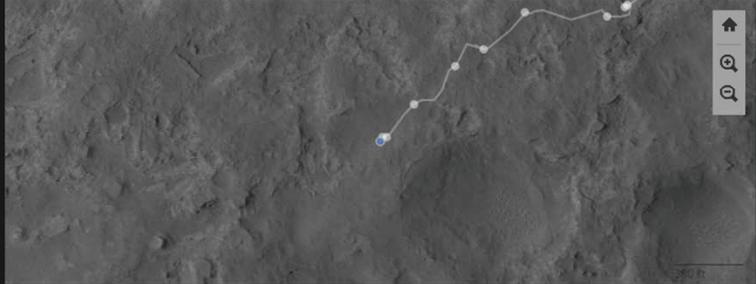
THE NORTH FACE

MARS CURIOSITY ROVER TRACKER

Sol 478

Rover update for Dec. 10, 2013

Curiosity continues to examine a group of flat rocks, where it is expected to dump a sample of powdered rock from the Cumberland drill site.



Timeline

Landing site Jake M. Rocknest Yellowknife Bay John Klein Problems Behind Sun Cumberland Shaler Drive

Facebook Twitter Google+ Email Share

Show all downloads...

The U.S. could *lead the world* in this area of educational innovation

NASA could lead the U.S.



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	30 per year	Average circulation per release	140 million
Outreach	3,300 per year	Total circulation per year	3.8 billion

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 students 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 .

*McREL conducted a learning outcome study showing that students using STSci's Planet Impact would score 13 percentile points higher than a control group on a standardized test.

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

\$3.7 Million

Chandra



Chandra

Formal Education	Number Reached (FY12)
K-12 Students, Direct Interactions	4,500
K-12 Teachers, Direct Interactions	898
K-12 Students Engaged	893,000
K-12 Teachers Engaged	97,500

Informal Education	Number Reached (FY12)
Participants/Observers Engaged	8,800,000

Outreach	Number Reached (FY12)
General Public, Direct Interactions	12,000
General Public Engaged	9,900,000

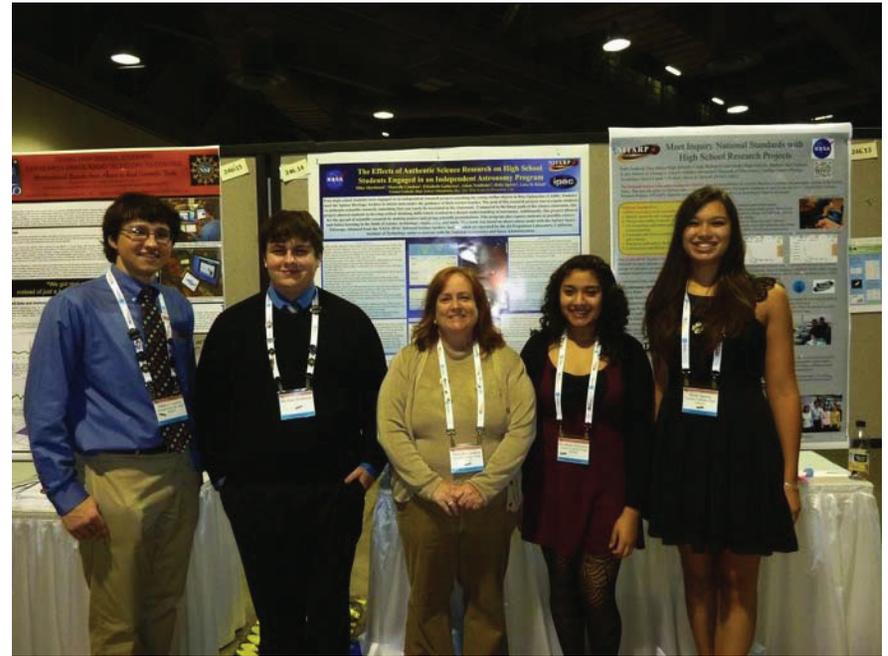
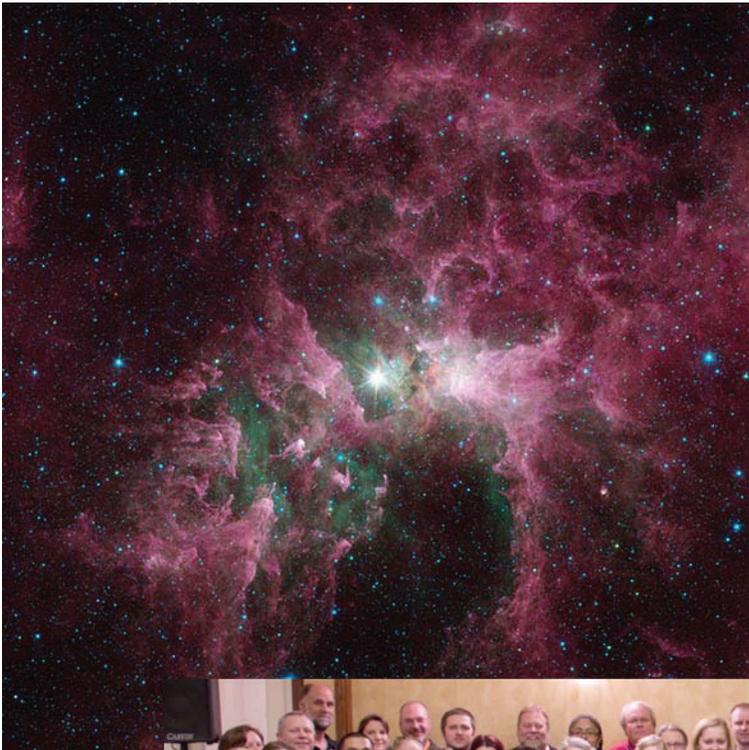
Chandra EPO is known for its pioneering and award-winning work in “**public science**,” placing NASA astronomical content into non-traditional spaces such as public parks, airports shopping malls and more.

Follow-up of **Chandra-Rutgers Astrophysics Summer Institute** student participants shows:

- 83% enrolled in or completed a degree program reported majoring or minoring in a STEM subject.
- “Reinvented my understanding of science. The program has given me the confidence to pursue a career in science.”

From Earth to the Universe (FETTU): Approximately 70 countries hosted FETTU in nearly 1,000 sites—from small villages to the largest cities with budgets of all sizes—in conjunction with the International Year of Astronomy. Through public science projects such as FETTU, Chandra’s reach includes Spanish-speaking audiences, visually-impaired audiences and tens of millions of participants from the greater public.

Spitzer/Infrared Processing & Analysis Center



Spitzer

Formal Education	Number Reached (FY12)
K-12 Students, Direct Interactions	100
K-12 Teachers, Direct Interactions	25
K-12 Students Engaged	1,200
K-12 Teachers Engaged	3,000

Informal Education	Number Reached (FY12)
Participants/Observers Engaged	1,250,000

Outreach	Number Reached (FY12)
General Public, Direct Interactions	50,000
General Public Engaged	100,000

Web Statistics	April 2013
CoolCosmos + Spitzer	2,103,341

From teachers:

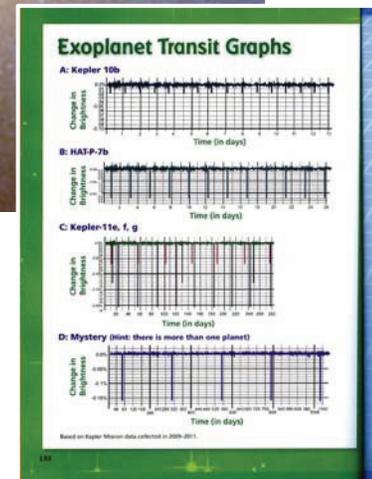
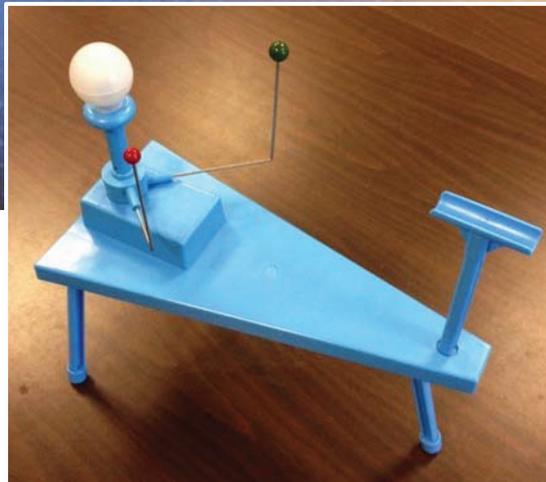
- “My NITARP experience has made me rethink my entire approach to science education.”
- “Because of my experience with NITARP, it has become clear to me that programming skills are essential for students entering scientific fields [and so I am teaching myself programming to get it into classrooms]”

From students:

- “[As a result of this experience,] I will definitely be involved in research in college starting my freshman year.”
- “I am now extremely interested in doing research.”

The Spitzer Science Center and Infrared Processing and Analysis Center (IPAC) have a long history of engaging students, educators, and the general public in the world of infrared astronomy and the multi-wavelength universe through award-winning websites, videos/podcasts, educational materials, and **authentic research experiences.**

Kepler



Kepler

Formal Education	Number Reached
K-12 Students, Direct Interactions	2,849 (FY12)
K-12 Teachers, Direct Interactions	1,089 (FY12)
GEMS Space Science Sequence	1500+ teachers, 45,000+ students per year

Informal Education	Number Reached
Kit for Night Sky Network Amateur Astronomy Clubs	500+ events, 25,000+ people
Strange Planets Planetarium Show	70+ planetaria, 30,000+ visitors

Outreach	Number Reached
Star Date Radio Broadcasts	Millions of listeners, 250,000+ website visits

Partnerships
with leading
education/outreach
organizations
enable national
reach and
impact.

- **GEMS Space Science Sequence:** Pre to post-test **student learning gains were statistically significant** for all units and grade levels. Grades 3–5 gain ranged from 12% to 20%. Grades 6–8 gains ranged from 11% to 17%.
- **Full Option Science System:** FOSS curriculum is used in all fifty states by **over 100,000 teachers and 2 million students**; it is in about 16% of the nation's school districts. More importantly, FOSS is adopted in **50 of the 100 largest urban school districts** where FOSS reaches large populations of under-served students.

Cassini



Cassini

Formal Education	Number Reached (FY12)
K-12 Students, Direct Interactions	19,099
K-12 Teachers, Direct Interactions	1,821
K-12 Students Engaged	108,629
K-12 Teachers Engaged	1,000

“Reading, Writing, & Rings” teacher professional development workshops have reached over 122,000 teachers.

Over 52,200 US students and 5,000+ students from 50+ countries have participated in “Cassini Scientist for a Day.”

Informal Education	Number Reached (Total)
“Ring World” planetarium show + DVD	200 planetariums; 60,000 DVD copies representing millions of viewers globally

Outreach	Number Reached (Total)
General Public, Direct Interactions	53,000 via Solar System Ambassador Cassini events
General Public Engaged	9,880,000 + 3 million unique annual visitors to the Cassini website

10 million “What’s Up” video podcasts downloads since 2007, used in classrooms, planetariums, museums, & by TV meteorologists

Evaluation Findings:

- Teachers see increase in students’ positive attitudes towards science.
- Teachers indicate students learned science facts about Saturn, science vocabulary, and benefited from practice in writing.

From Cassini Audiences:

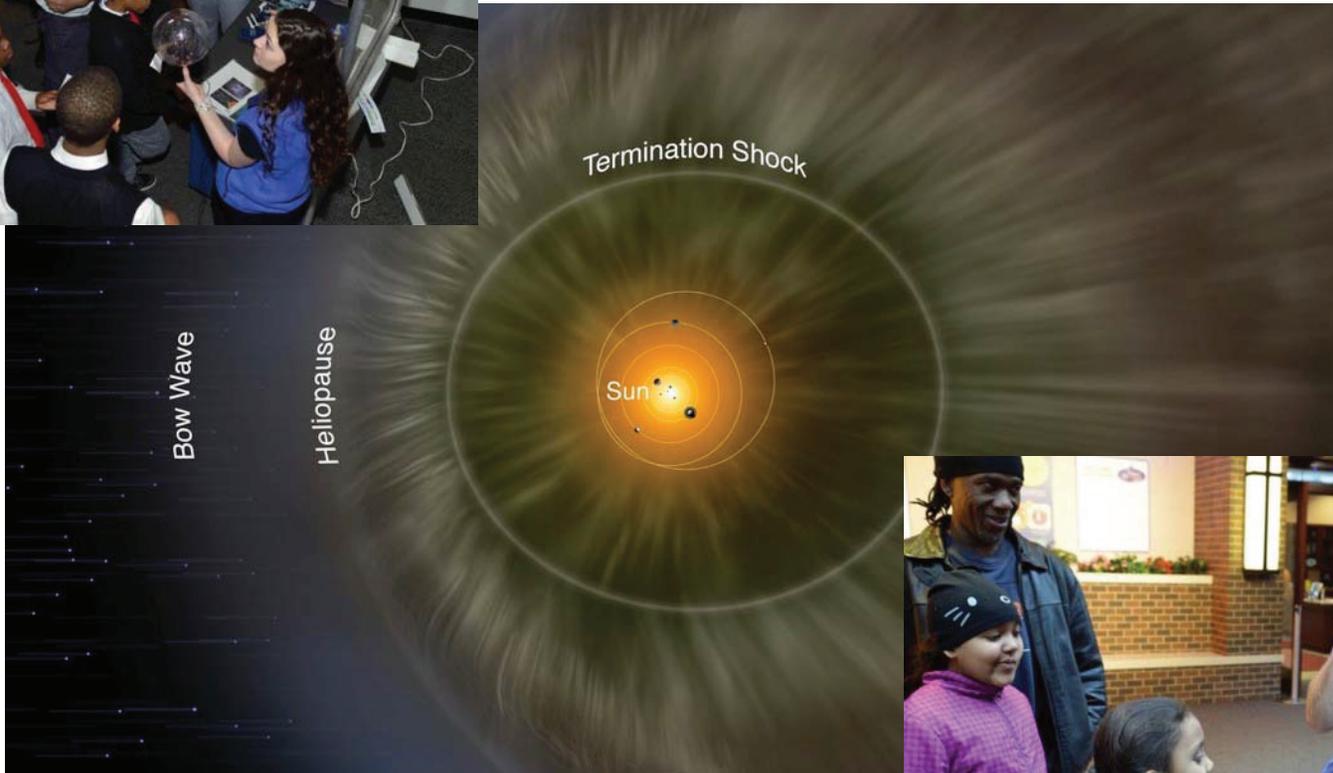
- *“I think winning the Cassini Scientist for a Day contest was one of the most important formative experiences I had in making my decision to study engineering.”*
- *“By letting students explore what is out there, we open endless possibilities for their future.”*

Saturn Observing Campaign:

- 500 trained volunteer amateur astronomers have reached 500,000 people globally since 2003.

s learners of all ages in the excitement of space exploration and the wonder and discoveries within our outer solar system – and within the Saturn system.

IBEX



IBEX

Formal Education	Number Reached
K-12 Students, Direct Interactions	1,922 (FY12)
K-12 Teachers, Direct Interactions	166 (FY12)
K-12 Teachers, Heliophysics Educator Ambassador Program	84 (FY09-11)

Encounters with IBEX materials, experiences, and staff resulted in audiences that report they learned things they didn't know, want to learn more, and **plan to share what they learned with others.**

Informal Education	Number Reached
Space Explorers Afterschool Club	54 informal educators (FY11-12), 890 students (FY11-12)
IBEX Planetarium Show	106 U.S. locations, 90,000+ people (FY09-12)

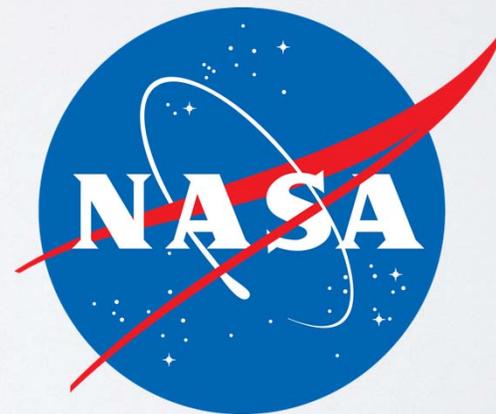
Outreach	Number Reached
IBEX Website	117,000+ visitors
Tactile Products for the visually impaired	498 distributed

- **Heliophysics Educator Ambassadors:** Trained educators significantly increased their knowledge of space science, used GEMS materials with their own students (13,400), and offered workshops for an additional 3,954 educators, who in turn used what they learned with almost 400,000 students.
- **People attending an IBEX planetarium show:** able to correctly identify what the IBEX mission is collecting (96%) and how the Solar System boundary is created (86%).
- *“Wish all available planetarium shows offered this level of quality support and resources”*

EDUCATION

- ▶ Unique
- ▶ Inspirational
- ▶ Years of experience, measurable effective
- ▶ AT-RISK (recommendation)

STEM =



At-Risk

- ▶ NAC EPO Committee Dissolved
- ▶ “STEM Integration” task force
 - ▶ Charter: integrate NASA’s education into the CoSTEM framework
 - ▶ Leader?
 - ▶ Budget Climate Uncertain
- ▶ Need Real Advocacy
 - ▶ With Administrator
 - ▶ With WH
 - ▶ With the Hill

Need to hear from public

**Request 1 transition meeting
with new leader.**

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

EDUCATION

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

Meet the master bureaucrat behind President Obama's controversial proposal to reshuffle the federal government's \$3-billion-a-year investment in STEM education

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 others [in the exhibit] told me that she knows how to get things done," says

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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 Smithsonian Institution by designating them as lead agencies.

The proposed reshuffling hit the U.S. scientific community like a bombshell. For

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.

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

Please Keep
the Flame Lit