National Space Grant College and Fellowship Program

National Council of Space Grant Directors' Meeting
Hosted by Wisconsin Space Grant Consortium
21 September 2011

Diane D. DeTroye
Manager, National Space Grant College and Fellowship Program

Outline

- NASA's New Directions
- NASA Education New Directions
- The NASA Education Portfolio
- The Situation for 2012
- 2010 Space Grant Data Collection
- Status of Solicitation/Competitions
- Upcoming Activities
- Office of Education Performance Measurement (OEPM) System

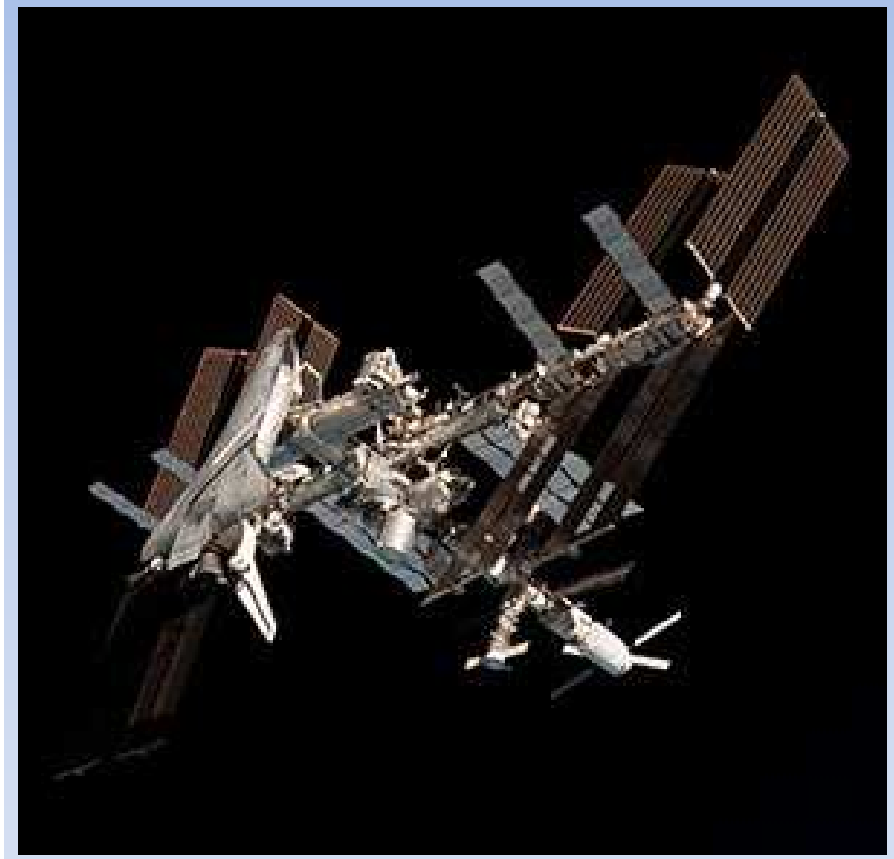
The Shuttle Program

- The Shuttle Program was a remarkable chapter in America's history in space, and ushers in the next extraordinary installment in our nation's story of exploration.
- We salute the thousands of men and women who have made the shuttle program a success both on the ground and in space. Their legacy is historic, and we will build on it as we develop the next space transportation systems.
- We celebrate the shuttle's 30 years of success -- longer than any other human spaceflight program – and its many firsts and milestones. We remember the hard lessons learned that will help us to continually improve safety.

Next Steps

- ***However, tomorrow's space program is taking shape right now.***
- We have to get out of the business of owning and operating low-Earth orbit transportation systems and hand that off to the private sector, with sufficient oversight to ensure the safety of our astronauts.
- We need American companies to send our astronauts to the International Space Station, rather than continuing to outsource this work to foreign governments.

So, What's Next?



We are ***recommitting*** ourselves to human spaceflight. For example, the International Space Station:

- Six-member crews will be living and working aboard the International Space Station 24/7 until at least 2020.
- The ISS will be the centerpiece of our human spaceflight activities for the coming years, and the research and technology breakthroughs aboard ISS will facilitate our travel to destinations beyond low Earth orbit.

What else?

In supporting the ISS and facilitating commercial crew and cargo transportation, NASA will pursue two critical building blocks for future exploration –

- *an evolvable heavy-lift rocket*
- *a deep space crew vehicle*

- Complemented by key research and technology products to enable long journeys into deep space, NASA is making the investments required to begin the era of ***deep space exploration*** today.
- This new approach to getting our crews and cargo into orbit will create good jobs and expand opportunities for the American economy.

Space Launch System (SLS)

- The Space Launch System, or SLS, will be designed to carry the Orion Multi-Purpose Crew Vehicle, as well as important cargo, equipment and science experiments to Earth's orbit and destinations beyond.
- SLS will serve as a back up for commercial and international partner transportation services to the International Space Station.
- The Space Launch System will be NASA's first exploration-class vehicle since the Saturn V took American astronauts to the moon over 40 years ago.

Orion Multi-Purpose Crew Vehicle (MPVC)

Orion will serve as the exploration vehicle that will carry the crew to space, provide emergency abort capability, sustain the crew during the space travel, and provide safe re-entry from deep space return velocities.

- Spacecraft to serve as the primary crew vehicle for missions beyond LEO
- Capable of conducting regular in-space operations (rendezvous, docking, extravehicular activity) in conjunction with payloads delivered by the Space Launch System (SLS) for missions beyond LEO
- Capability to be a backup system for International Space Station cargo and crew delivery

Commercial Crew Development (CCDev)

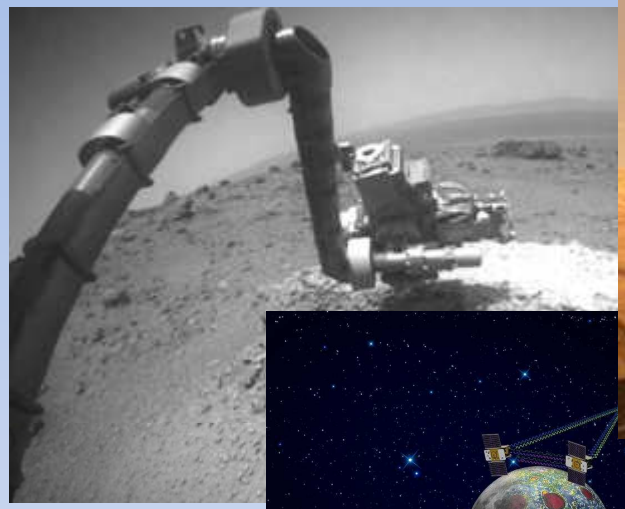
Designed to help spur the innovation and development of new spacecraft and launch vehicles from the commercial industry, creating a new way of delivering cargo – and eventually crew – to low-Earth orbit (LEO) and the International Space Station (ISS).

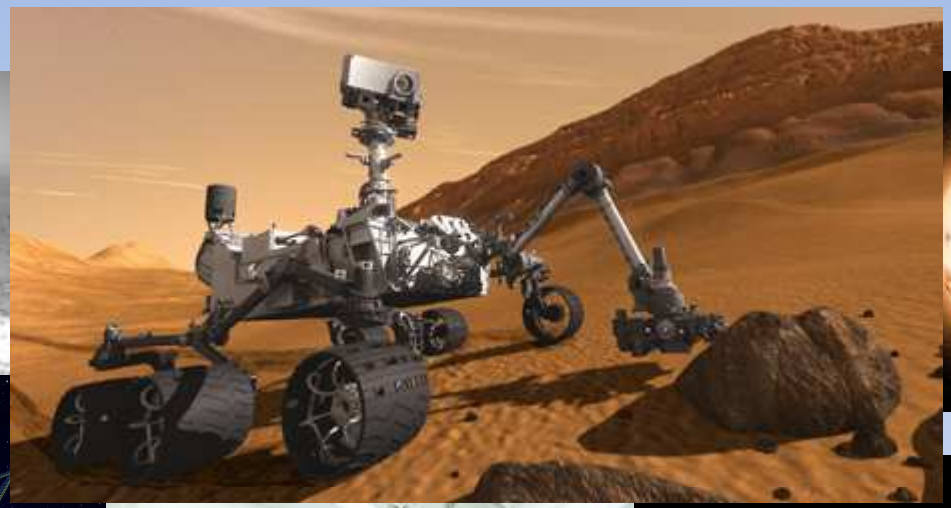
- Partners include:
  - Blue Origin
  - Boeing
  - Orbital
  - Paragon Space Development Corporation
  - Sierra Nevada Corporation
  - SpaceX
  - United Launch Alliance

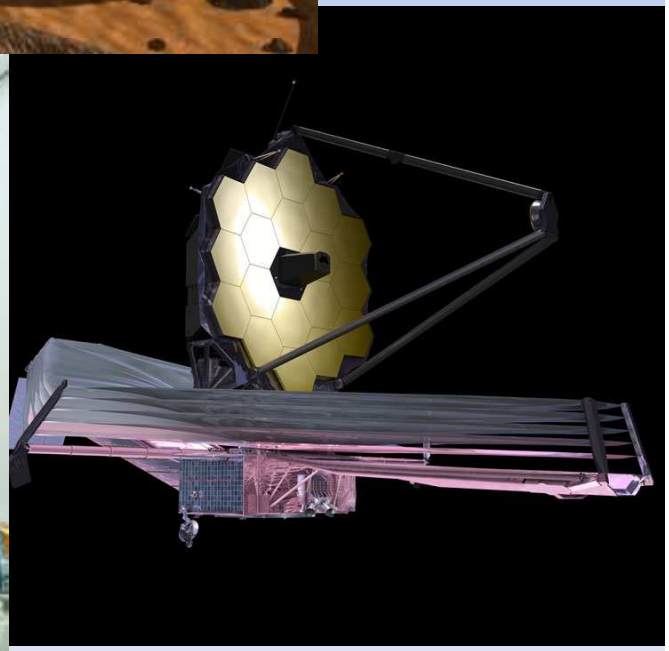
New Organization at NASA

- Creation of the new Human Exploration and Operations (HEO) Mission Directorate
  - Combined Space Operations Mission Directorate and Exploration Systems Mission Directorate
  - Provides the Agency with leadership and management of NASA space operations related to human exploration in and beyond low-Earth orbit.

Our other journeys continue!







The NASA Vision

"To reach for new heights and reveal the unknown, so that what we do and learn will benefit all humankind."

The NASA Mission

"Drive advances in science, technology, and exploration to enhance knowledge, education, innovation, economic vitality, and stewardship of Earth."

And we must not forget…

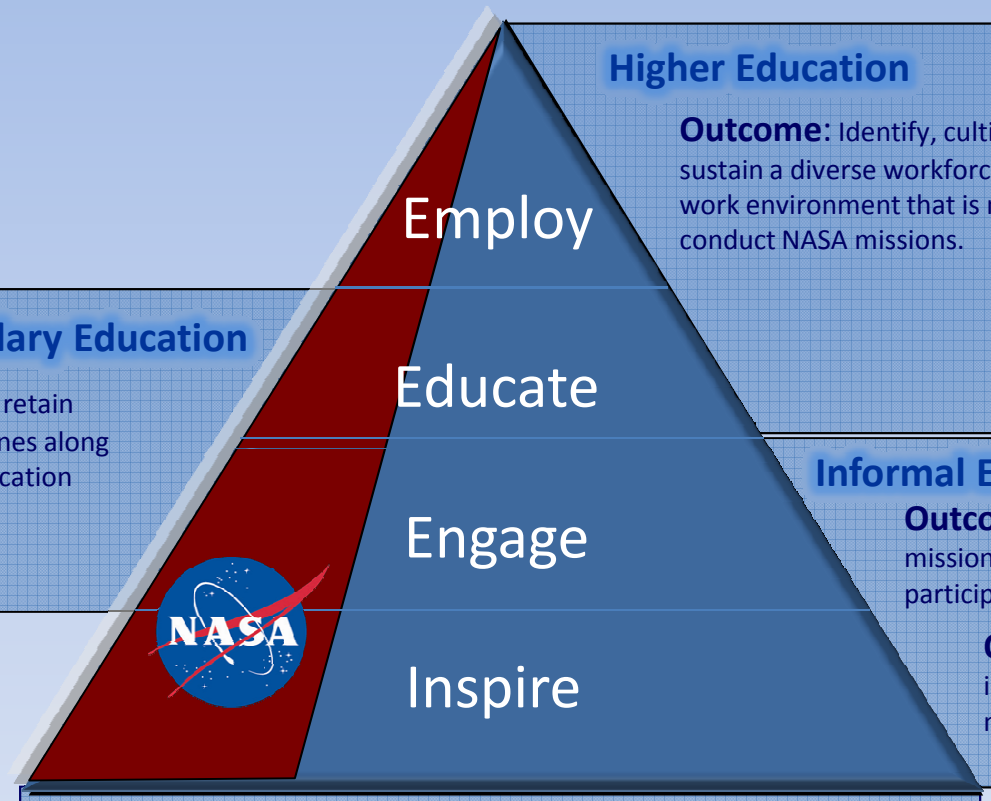
"We will continue to inspire the next generation of scientists, engineers and astronauts through our continued focus on STEM education initiatives."

…which leads us to…

NASA Education Vision

*To advance **high quality** Science, Technology, Engineering, and Mathematics **(STEM) education** using **NASA's unique** capabilities.*

STEM Education Framework



Higher Education

Outcome: Identify, cultivate, and sustain a diverse workforce and inclusive work environment that is needed to conduct NASA missions.

Elementary/ Secondary Education

Outcome: Attract and retain students in STEM disciplines along the full length of the education pipeline.

Informal Education

Outcome: Engage the public in NASA's missions by providing new pathways for participation.

Outcome: Inform, engage, and inspire the public by sharing NASA's mission, challenges, and results.

Strategic Partnerships

Outcome: Build strategic partnerships that promote STEM literacy through formal and informal
means.

* Science, Technology, Engineering and Mathematics (STEM)

Budgeting in Extreme Environments
The Outlook for 2012-13

- Best estimates predict that we will be on a Continuing Resolution through mid-Nov 2011
- Overall Federal Budget Challenges
  - ~$1.4 trillion in cuts to be found by Congressional Super Committee
  - If no decisions by joint committee, automatic cuts across the federal gov't
    - Memo from Jacob Lew, Director, OMB – August 2011
- Overall Agency requests for 2013 should be at least 5% below 2011 enacted appropriation
  - With options for additional discretionary funding reductions that are at least 10% below 2011 enacted appropriation
- NASA must cut approx. $1.7B

NASA Strategic Plan Goals and Outcomes

Strategic Goal 5: Enable program and institutional capabilities to conduct NASA's aeronautics and space activities.

- Outcome 5.1: Identify, cultivate, and sustain a diverse workforce and inclusive work environment that is needed to conduct NASA missions.
  - *Objective 5*.1.2- Provide opportunities and support systems that recruit, retain, and develop undergraduate and graduate students in STEM-related disciplines.

NASA Strategic Plan Goals and Outcomes

Strategic Goal 6: Share NASA with the public, educators, and students to provide opportunities to participate in our Mission, foster innovation, and contribute to a strong national economy.

- Outcome 6.1: Attract and retain students in STEM disciplines along the full length of the education pipeline.
  - *Objective 6.1.1*- Provide quality STEM curricular support resources and materials
  - *Objective 6.1.2* Provide NASA experiences that inspire student interest and achievement in STEM disciplines

NASA Strategic Plan Goals and Outcomes

Strategic Goal 6: (Con't)

- Outcome 6.2 Build strategic partnerships that promote STEM literacy through formal and informal means.
  - *Objectives 6.2.1-* Develop NASA leadership role in national STEM improvement efforts, as demonstrated by provision of meaningful educator professional and student experiences, adoption of education technologies, and contributions to STEM education policies and strategies.
- Outcome 6.4: Inform, engage, and inspire the public by sharing NASA's missions, challenges, and results.
  - *Objective 6.4.1-* Use strategic partnerships with formal and informal educational organizations to provide NASA content to promote interest in STEM

Education Design Team Charter

- To assist the Agency in establishing goals, structures, processes and evaluative techniques to implement a new sustainable and innovative STEM Education program

- Established to develop a strategy to improve NASA's education offerings (Office of Education and mission directorates, and center programs/projects)

Design Team Findings and Recommendations

Programmatic recommendations

1. Focus the NASA Education Program to improve its impact on areas of greatest national need.
   - Professional training and development of educators working with middle-school age students;
   - Higher Education program that provides experimental opportunities for students
2. Identify and strategically manage NASA Education Partnerships.
3. Participate in National and State STEM Education policy discussions.

Design Team Findings and Recommendations

<u>Organizational recommendations</u>

1. Establish a structure to allow the Office of Education, Centers, and Mission Directorates to implement a strategically integrated portfolio.
2. Expand the charter of the Education Coordinating Committee to enable deliberate education program design and evaluation.
3. Improve communication to inspire learners

Education Program & Project Structure for FY2012

STEM Education and Accountability

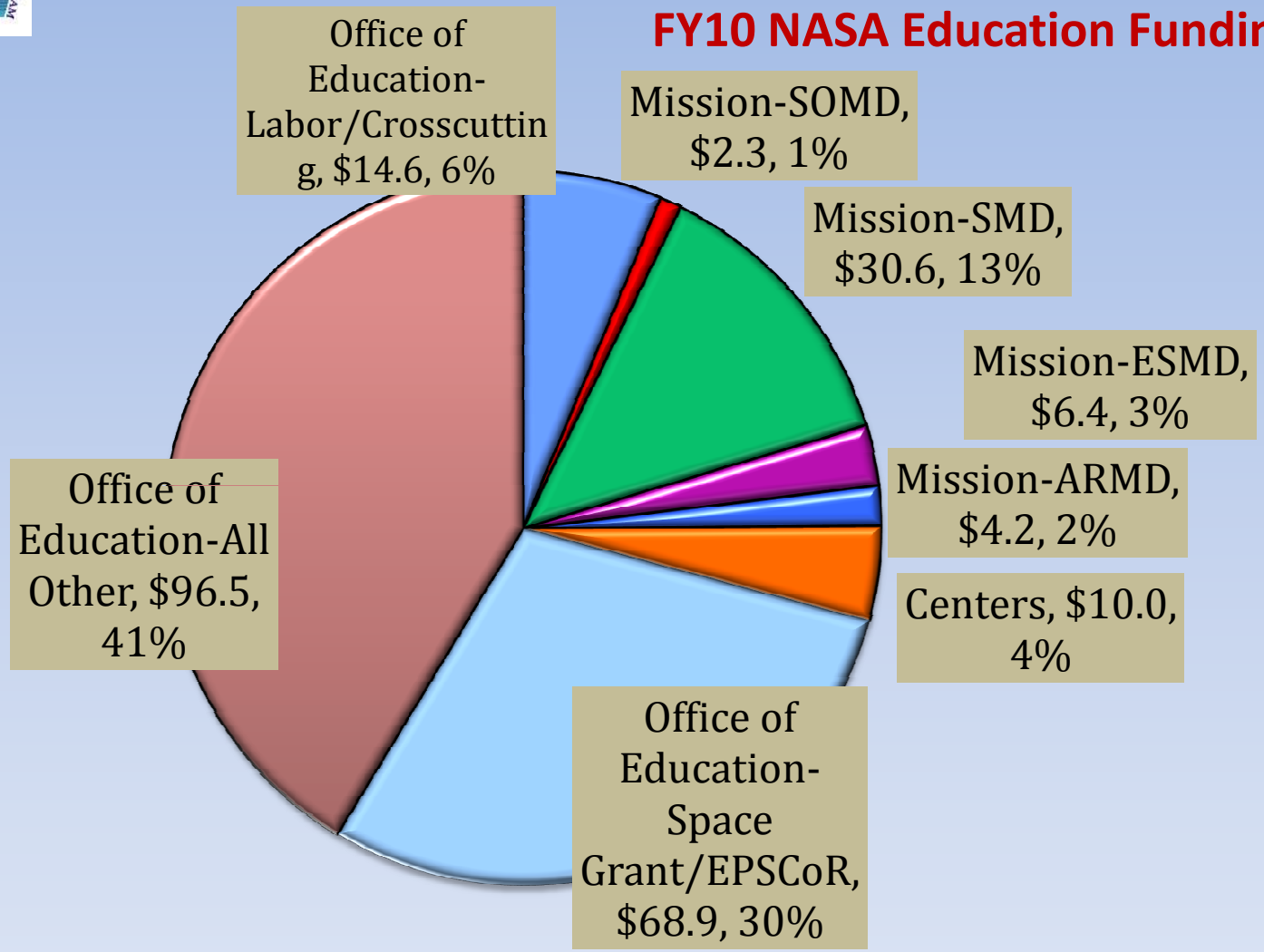
- Formal & Informal Education
- Minority University Research & Education Project (MUREP)
- Innovation in Education
- Evaluation, Performance Monitoring and Accountability

Aerospace Research & Career Development

- National Space Grant College and Fellowship Program
- Experimental Program to Stimulate Competitive Research (EPSCoR)

Agency FY 2010 STEM Education

FY10 NASA Education Funding by Source



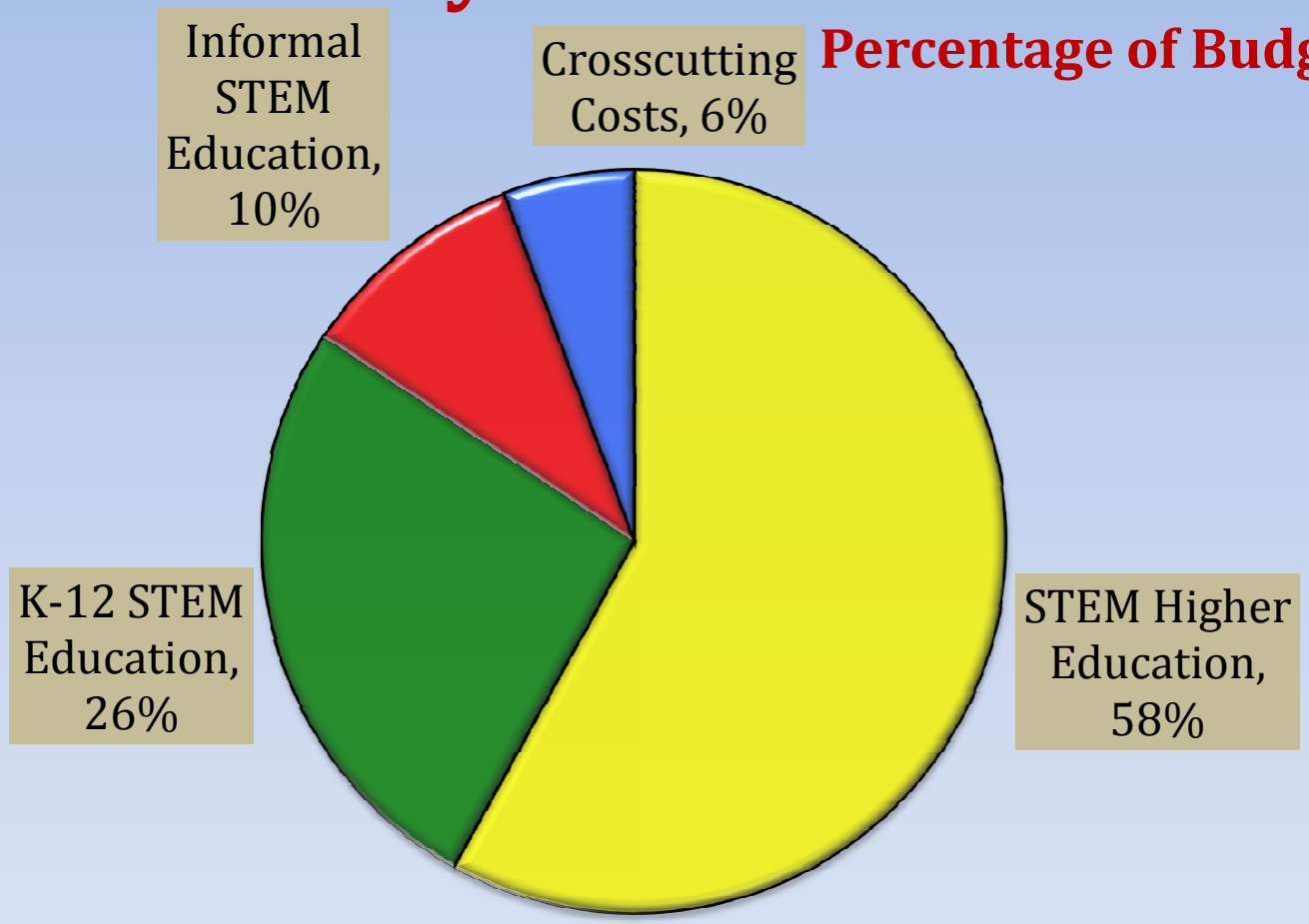
Additional Congressionally Directed Appropriations (NASA CAS Account) $18.4M

ARC $0.6M
GRC $1.5M
GSFC $1.1M
JPL $1.0M
JSC $3.1M
KSC $1.1M
LaRC $1.0M
MSFC $0.6M
SSC <$0.1M

Agency Total Investment $233.5M

FY10 Agency Education Portfolio by Outcome

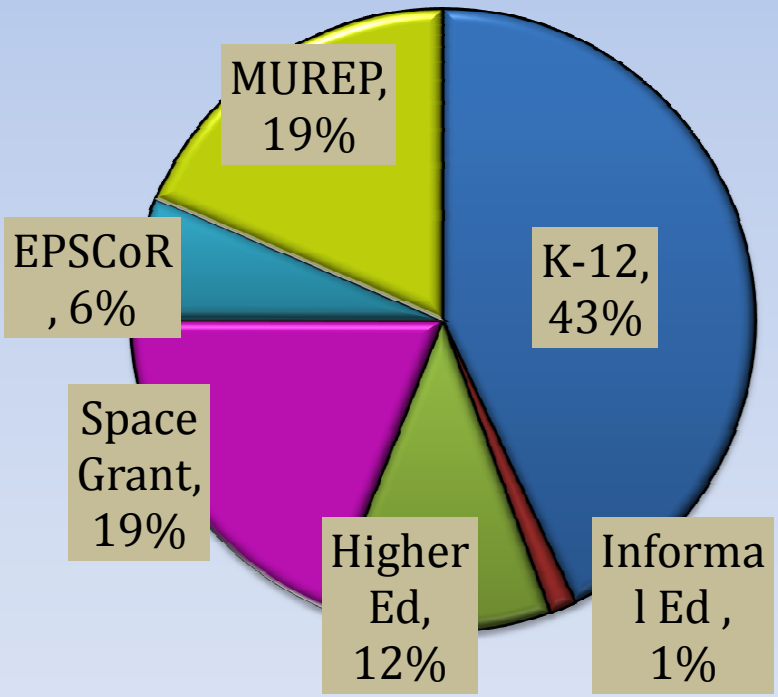
Percentage of Budget



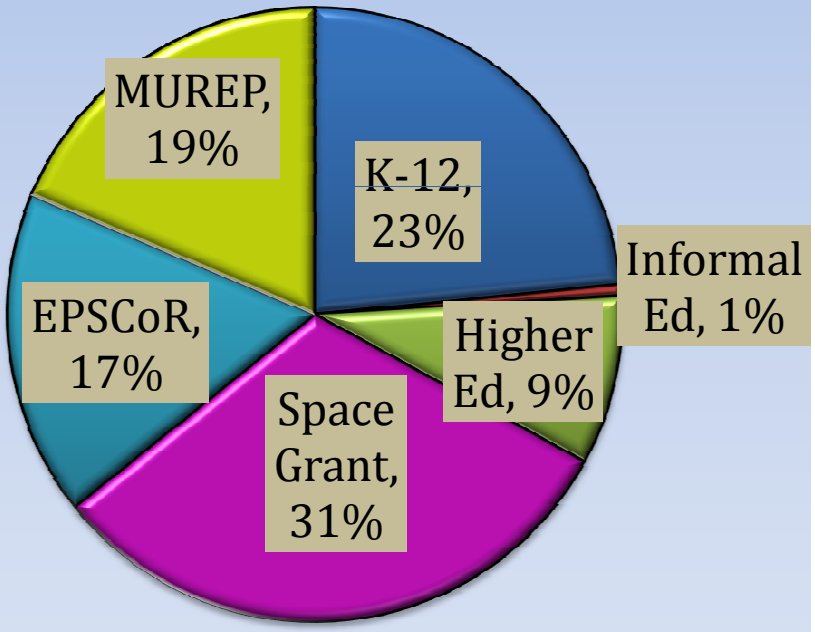
*Crosscutting costs include labor, conference support, liens, database development, evaluation, etc.

FY11 Office of Education Budget Structure

FY11 PBR



FY11 Enacted



NASA Education
NEW: Integrated Matrix Approach

Investment Strategies

- Education networks to connect communities of practice
- Access to and utilization of NASA's unique assets and platforms
- Web infrastructure and distribution networks
- Educator professional development
- NASA scholarships, internships and fellowships
- Competitive opportunities and partnerships
- Innovative pilot opportunities

6 Key Themes *

- Scalability
- Global Design Challenges
- Teacher Preparation
- Infrastructure
- Innovation
- Evaluation and Accountability

* Essential Portfolio elements

2010 Space Grant Data

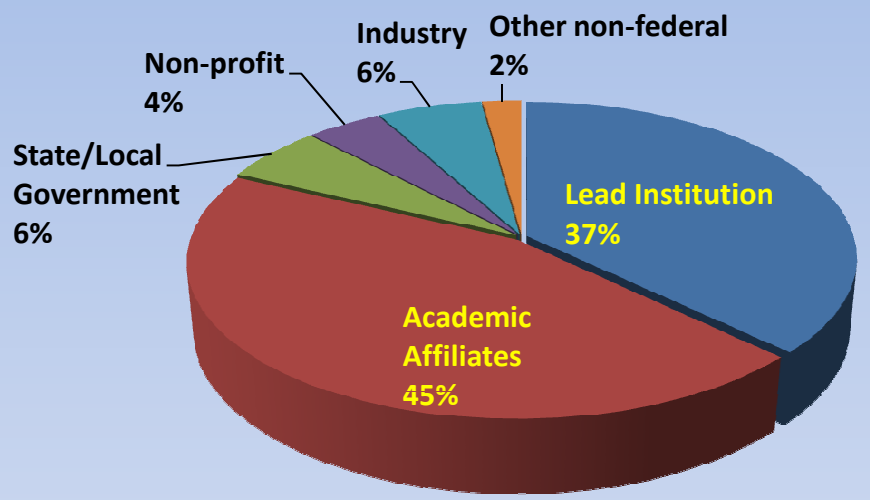
2010 Data Review

- Like last year, you will get a consolidated report of your submission
  - You will be given the opportunity to make edits and return
- Clarification
  - 32. Please describe or provide example(s) of collaboration between the Colleges of Education and the Science and/or Engineering Colleges/Departments that exist in institutions throughout your consortium (directly attributable to Space Grant effort/intervention). These examples can be new or long-standing relationships developed prior to FY2010. Additionally, provide a brief summary of the outcome or benefit resulting from the collaboration.

The Space Grant National Network:

Composition and Leverage

Affiliate Partner Type	Number
IHE- Bachelors and/or Graduate Degree	549
IHE- Community/2-Year Institutions	112
Total Academic Affiliate Partners	**661**
Government (Federal/State/Local)	77
Industry	91
Museum/Science Center/Planetarium	75
Other and Other Non-Profit Organizations	102
Total Non-Academic Affiliate Partners	**345**
Total Affiliate Partners	**1,006**



Diversity of Academic Affiliates is a Key Emphasis of the Program*:

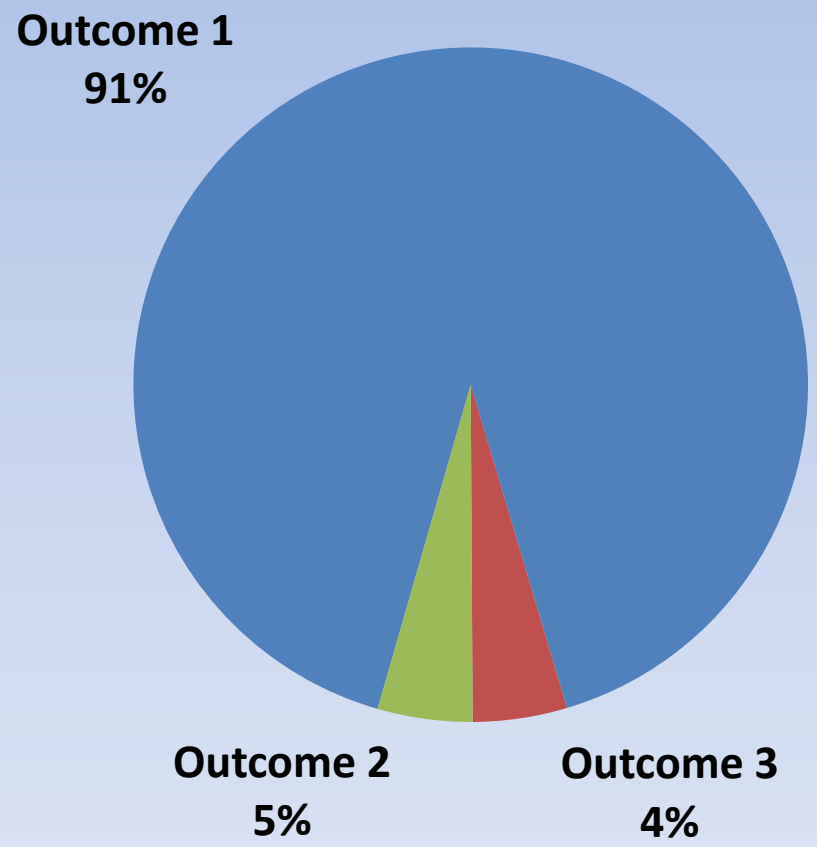
- 43 Hispanic Serving Institutions
- 47 Historically Black Colleges or Universities
- 22 Tribal Colleges or Universities
- 21 Other Minority Universities

Funds Leveraged by NASA Funding Support 90%

Establish and maintain a national network of universities

* MSIs = 20% of the total academic affiliates

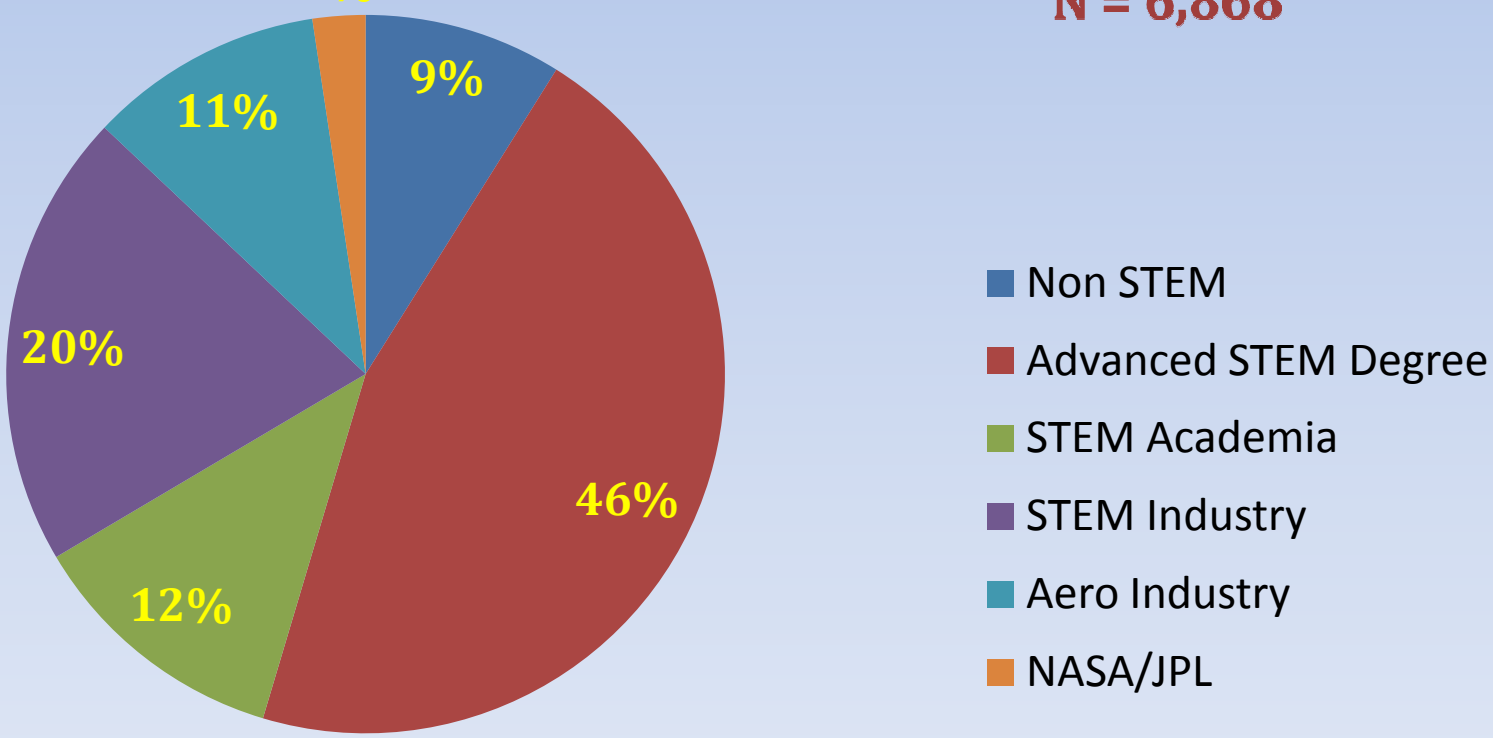
Promote a strong science, mathematics, and technology education base from elementary through secondary levels.



Recruit and train U.S. citizens, especially women, underrepresented minorities, and persons with disabilities.

Space Grant Longitudinal Tracking 2006-2010

N = 6,868



NASA Education Annual Performance Goals

SPACE GRANT CONTRIBUTION TO 2011 ANNUAL PERFORMANCE GOALS							
		Office of Education Result	Space Grant Result	Office of Education Result	Space Grant Result	Space Grant Contribution to OEd Result	Notes
APG 1	Achieve 40% participation of underserved and underrepresented (in race and/or ethnicity) in NASA higher education projects	35%	26%	Total Under-represented = 5,605	Total Under-represented = 3,182	57%	Does not include Underrepresented Higher Education Faculty Participants
APG 2	Achieve 45% percent participation of women in NASA higher education projects	39%	38%	Total Female Students = 6,042	Total Female Students = 4,773	79%	Does not include Higher Education Female Faculty Participants
APG 3	75,000 Educators participate in NASA education programs	94,919	19,413			20%	Does not include Higher Education Faculty. This figure is only InService Formal and Informal Educators.
APG 4	25,000 undergraduate and graduate students participate in NASA education programs.	35,684	23,353			64%	For Graduate and Undergraduate Participants reported in Precollege and Informal Activities, the Gender and Ethnicity are unknown. It is not collected.
APG 5	600,000 elementary and secondary students participate in NASA instructional and enrichment activities.	863,879	185,708			21%	Gender, Race, Ethnicity, and Grade Level data are not collected.
Prepared August 26, 2011							

Comparison 2009 - 2010

	FY09 FINAL	FY2010
Number of Precollege Students	124,813	185,708
Number of Precollege Teachers (In-Service)	14,415	16,827
Number of Informal Educators	1,898	2,586

Trend 2006-2010

Significant Award – Underrepresented and Female Participants

	FY06	FY07	FY08	FY09	FY10	Average
Percent Underrepresented	**22%**	**23%**	**25%**	**24%**	**24%**	**24%**
Percent Female	**41%**	**39%**	**38%**	**36%**	**38%**	**38%**

Upcoming

- Space Grant Congressionally-Directed Augmentation
- “Other Competitive Solicitation” ($5M)

OEPM Update

- IDMax
  - Multi-step process
    - Establish your “identity” through the Identity Management and Account Exchange (IdMAX) system
      - “Remote User” Identity
    - Once your “identity” is established, then access to specific applications and systems is approved
      - Office of Education Performance Measurement (OEPM) System
      - At least 2 contacts/consortium

Please send Consortium Activity Highlights to this address:

HQ-Space-Grant@mail.nasa.gov

- Upcoming events which are **unique** to your consortium
- May include noteworthy events, activities, milestones, press conferences, interviews - particularly events that include legislators - that would be of interest to the NASA Administrator and his immediate staff.
- **Cite the connection** with your Space Grant consortium or EPSCoR efforts
- Include the usual who, what, when, where, why of a news article
- Keep your descriptions simple, short, and high level
- Report **major milestones or events**, not ongoing activities or events, or programs/projects unless they have reached a milestone.