



We must unleash the
genius of private enterprise
to secure the United States'
leadership in space.

- President Barak Obama
2008



Opening Space for Public Benefit

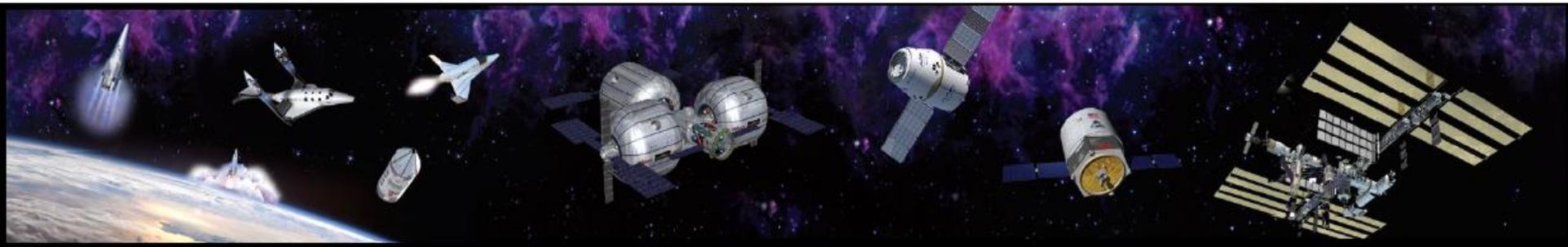
Daniel J. Rasky
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1 May 2013

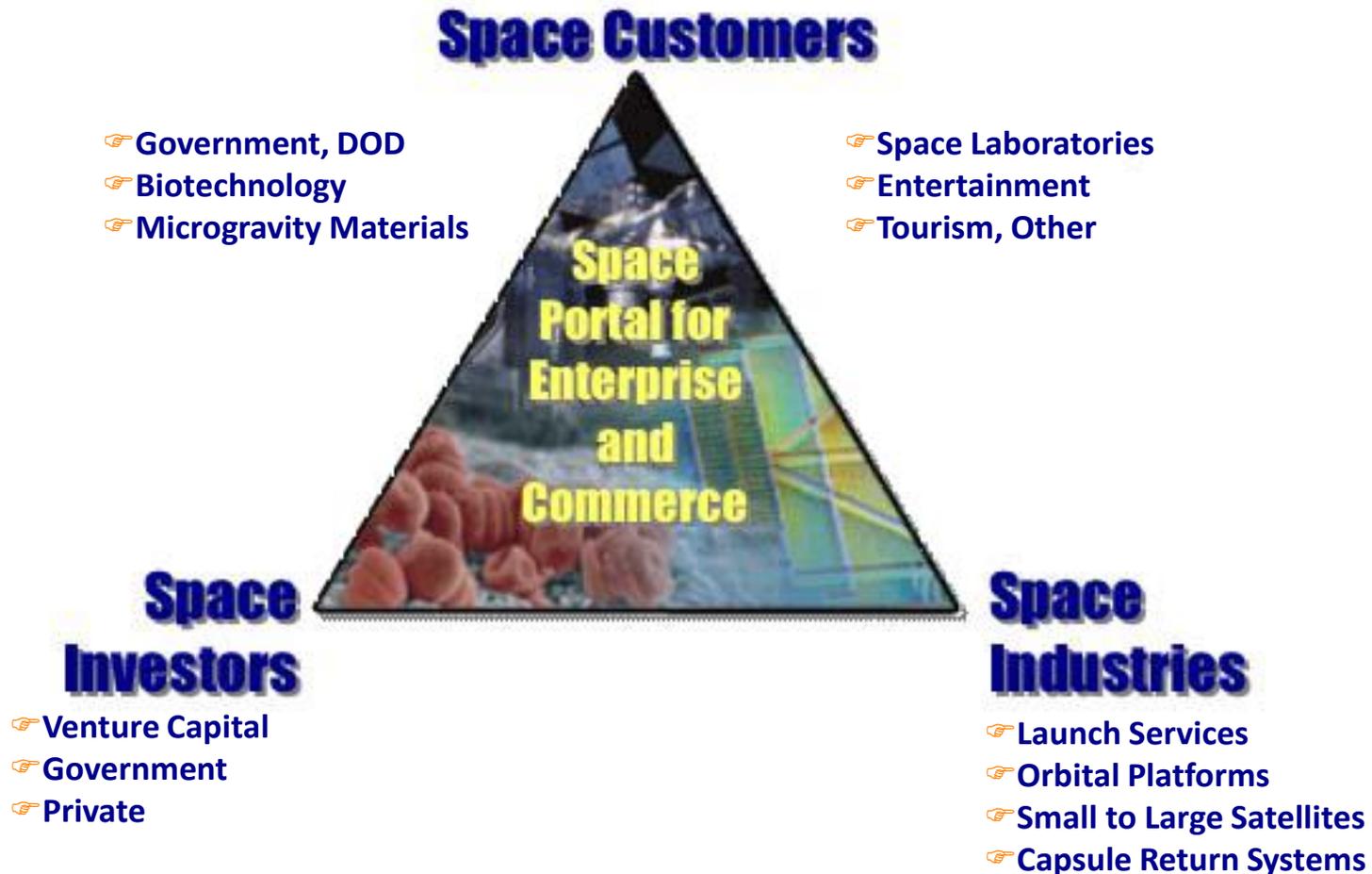


Space Portal

- **Formed to serve as a “Friendly Front Door” to companies interested in working with NASA**
- **Goals:**
 - **Promote the vision** of the President, Congress and NASA to establish a **self-sustaining commercial space economy**
 - **Infuse entrepreneurial practices** into the civil space program
 - Accelerate development of the **new space economy for public benefit, economic advancement and exploration**
 - Act as a **catalyst for mutually beneficial partnerships** that leverage resources among NASA, industry, universities, nonprofits and government
 - Organize and execute **pioneering developments and demonstrations that open new markets**
 - **Engage the public and inspire the next generation** of space scientists, engineers, explorers and entrepreneurs



Entrepreneurial Space Paradigm



Fostering development of Space Customers and Emerging Space Industries will attract Space Investment and lead us to the tipping point for commercial space



Ames Research Center

in Silicon Valley



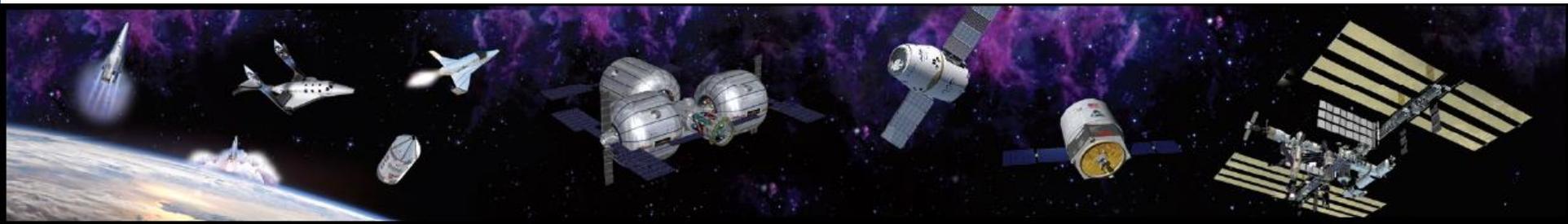
Emerging Space Partners



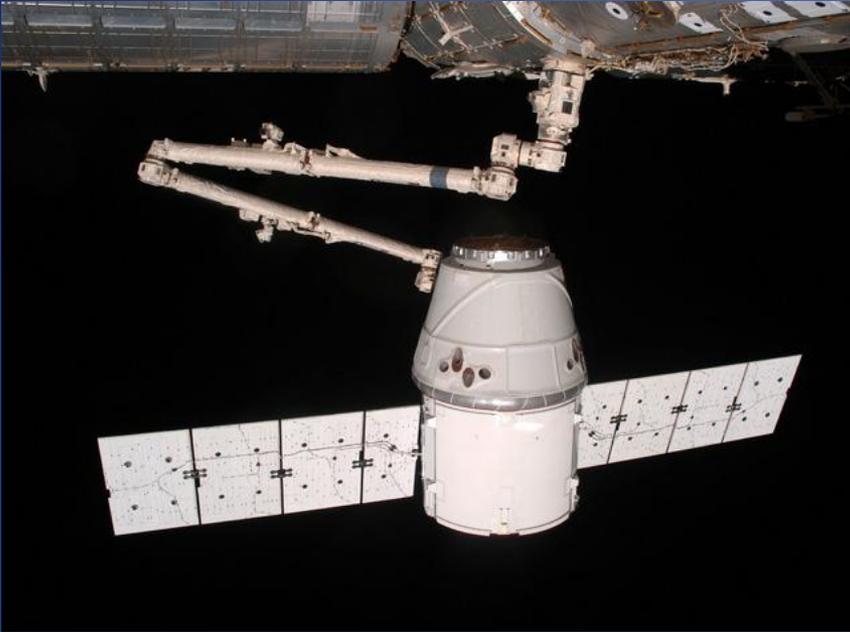
Space Portal: What We've Done

2005-Present

1. COTS Program
2. CRuSR Program
3. Google Lunar Xprize Collaboration
4. SpaceX Dragon Heat Shield
5. Space Investment Summits
6. Re-Entry Breakup Recorder
7. STEM Education
8. Exploration UpLink
9. Regolith Centennial Challenge
10. NewSpace Conferences
11. CRAFT Conferences
12. AIAA Commercial Space Group
13. Silicon Valley Space Club
14. Low-Cost, Reliable Access to Space Roadmap
15. Commercial Space Market Areas
16. Innovative Lunar Demo Data
17. NASA Make Challenge
18. DIY Space (Dedicated Make Issue)
19. Fresh Look at On-orbit Fuel Depots (\$2.4M study contracts now issued)
20. Scenario Based Planning
21. Initiated SimSpace
22. Commercial Lunar Opportunities
23. ISS User Paradigm
24. Broaden Uses and Users of Space
25. Promoted KentuckySpace
26. Established Exomedicine
27. Book and Magazine articles
28. Pacific International Space Alliance
29. International Lunar Research Park



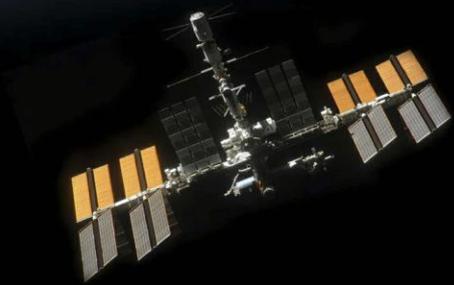
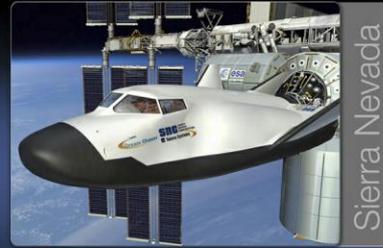
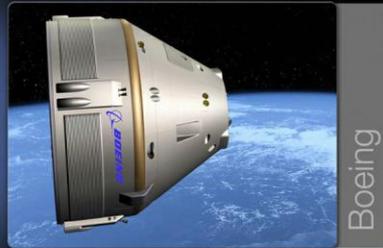
SPACEX



**Provided Critical Technology
Transfer and Expert
Consultation Support for
Primary Dragon Heatshield –
PICA-X**



Commercial Crew Program



SPACE FRONTIER
FOUNDATION

NEWSPACE 2013

PREPARING FOR EXPONENTIAL GROWTH

JULY 25-27

SILICON VALLEY, CA



NEWSPACE
2012
CONFERENCE
July 26-28

NEW PROFITS NEW PRODUCTS NEWSPACE
newspace.spacefrontier.org

The poster features a blue and purple space-themed background with a rocket launch, silhouettes of two people shaking hands, and a view of Earth from space.

NASA Ames Research Center
SILICON VALLEY, CA

NEWSPACE 2011
THE NEXT BIG THING
JULY 28-30

The poster shows a Mars surface with a rover, solar panels, and an astronaut standing on a rock. Diagonal red and yellow stripes cross the top left.

2010
new
space

The poster features a central vertical strip with a rocket launch, flanked by two astronauts in white suits. The background includes a rainbow and a satellite in orbit.

Ames Has Been a Strong Advocate of Emerging Space

- **Assembled brilliant minds in National Workshops to develop new opportunities for using space for public benefit, including:**
 - *An Entrepreneurial Paradigm for the ISS*” in June 2005. Beginning of Exomedicine.
 - *“ISS National Laboratory Workshop”* in October, 2007. Helped motivate “new thinking” on the operation and use of the ISS.
 - *Commercial and Government Responsive Access to Space Technology Exchange (CRASTE)*, in October, 2010 in collaboration with AFRL – largest attendance ever.
 - *“Exploratory Workshop for the International Lunar Research Park”* in April, 2011 – highlighted on “This Week at NASA”.
 - *NewSpace Conferences starting in 2009 thru 2013*. This year’s meeting anticipated to be the most successful ever!



ISS National Lab Workshop

October 9-12, 2007

Baruch Blumberg, Nobel Laureate
Chairman

NASA Ames Research Center



Creating the first National Laboratory beyond Earth

INTERNATIONAL LUNAR RESEARCH PARK

EXPLORATORY WORKSHOP

5 April 2011

Been there ... never done this!

ILRP Exploratory Workshop 2011

[Home](#)[Invitation Letter](#)[Summary](#)[Agenda and Presentations](#)[Notional Build Sequence](#)[Baruch Blumberg](#)[Participants](#)[Recommendations](#)[Downloads](#)[Sitemap](#)

Home

Been there ... Never done this!

The International Lunar Research Park Exploratory Workshop was held Tuesday 5 April 2011 at the NASA Ames Conference Center.

The purpose of the workshop was to gather experts and pioneering thinkers from across the United States to explore innovative opportunities to enhance multinational collaboration in the exploration and development of space.

Discussions focused on the potential benefits and feasible approaches to establishing a multinational research park on the Moon over the next decade, prototyped through analog facilities on Earth, that would be developed with strong U.S. leadership and operated by a consortium of space-faring nations through public-private partnerships.

The Workshop was organized by the State of Hawaii as part of a grant and Space Act Agreement with NASA for exploring concepts for human exploration and development of the Moon.

For more background information on the International Lunar Research Park, [click here](#).

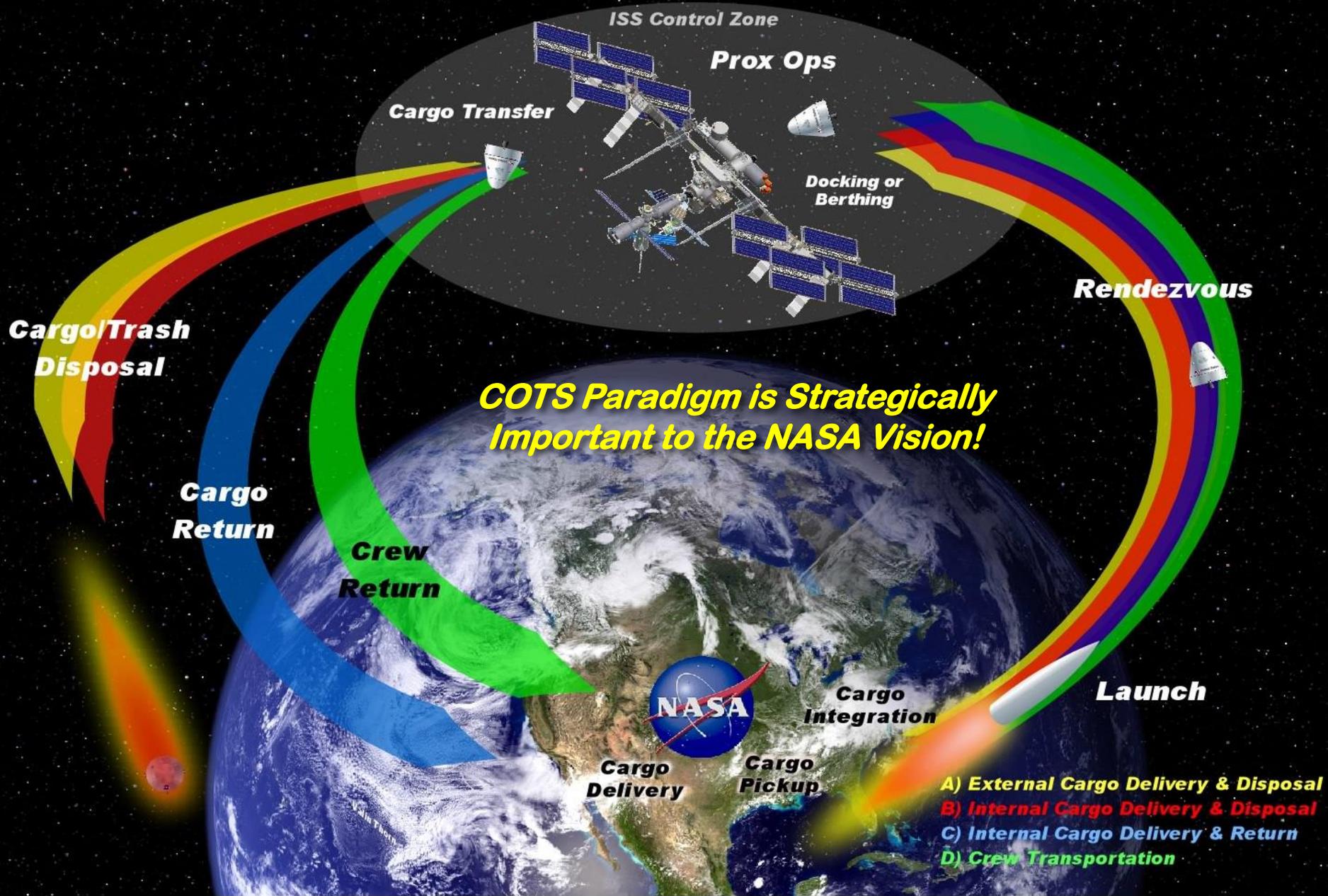


Ames Has Been a Strong Advocate of Emerging Space

- **Provided program creation support and guidance for NASA's**
 - *Commercial Orbital Transportation Services (COTS) program*
 - *Commercial Crew Program*
 - *Centennial Challenges program*
 - *Flight Opportunities Program*
 - *Innovative Lunar Demonstration Data (ILDD) program, supporting the Google Lunar X-prize*



NASA Commercial Crew/Cargo Project Commercial Orbital Transportation Service



2009 Regolith Excavation Challenge

October 17-18, 2009, NASA Research Park, Moffett Field, CA



www.californiaspaceauthority.org/html/regolith2009.html



Paul's Robotics-1st Place

Three teams awarded \$750,000 in prize money for lunar robotic prototypes



Terra Engineering
2nd Place



Team Braundo-3rd Place

Team representation from 12 states & Canada

Competition was co-hosted by the California Space Education & Workforce Institute and the California Space Authority in collaboration with the NASA Lunar Science Institute and performed in a simulated lunar environment located in the NASA Research Park

Prize funding was provided by NASA Centennial Challenges



Remarks by NASA Administrator Charles Bolden

October 20, 2009

"Over this weekend, NASA just held a competition in California with \$750,000 in prizes for anyone in America who could move the most "regolith" — or moon dirt — with a robot. Twenty-three teams competed.

The winning team is "Paul's Robotics". Paul is a college student at Worcester Polytechnic Institute in Massachusetts.

He heard about the competition from a high school teacher.

Now that is inspiring."

Ames Has Been a Strong Advocate of Emerging Space

- **Initiated and pursued activities supporting emerging space:**
 - *Teachers in Space Education*
 - *Exploration UpLink*
 - *KentuckySpace*
 - *Exomedicine*
 - *NASA MAKE Challenge*
 - *Space Investors Summit*
 - *University classes on space entrepreneurship*
 - *Articles and Book Chapters*





Teachers in Space

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The Vision

Since the beginning of the Space Age, 50 years ago, students have been told that if they studied math and science, they could grow up to become astronauts and go into space.

Unfortunately, that was a false promise. Even at the height of the Shuttle program, a student had a better chance of becoming an NBA basketball player than a NASA astronaut. No wonder today's students show more interest in athletics than math and science.

What if we could turn that around and show students that they have a real chance for a future in space?

Imagine thousands of astronaut teachers, in schools all across the country, sharing their spaceflight knowledge and experiences with millions of students. This vision could become a reality within the next ten years.

Private companies are now developing a new



*Seated: Lynette Oliver, Chantel Rose, Rachael Manzer, and Maureen Adams
Standing: Mike Schmidt, Steve Heck, Stuart Witt (Mojave Air and Space Port), and Jim Kuhl.*

Pathfinders Lead the Way to the New Frontier

Exploration Uplink

Participatory Exploration Across the Internet Using Tele-robotics



May 5, 2010 Demonstration with South Africa

Regolith Test-bed



Visitors at the South African Astronomical Observatory in Cape Town remotely operated a rover located in the regolith test-bed at NASA Ames

"This is a good start to what we hope will be a conversation about broadening the cooperation between the Lunar Science Institute and the South African scientific and educational community."

Peter Martinez,
Director of SAAO and Interim Director of South Africa's Space Agency
May 5, 2010



MOTIVATION:

- ◆ Starting point for international partnership between NASA Lunar Science Institute and South African scientists
- ◆ Test-bed infrastructure in place at the NASA Research Park for Centennial Challenges' 2009 Regolith Excavation Challenge
- ◆ Hands-on STEM & Outreach using NASA field science rovers. First demonstrated at California & Washington State Middle Schools in April 2010

FUTURE:

Expand with additional U.S. schools and international partners

KEY PARTNERSHIPS:

NASA Spaceward Bound
NASA Ames Intelligent Robotics Group
California Space Authority
NASA Lunar Science Institute

"A lot of folks came up to the podium after the conclusion of the program to say how much they enjoyed the Exploration Uplink demo and to ask if it would be repeated again in future."

Peter Martinez,
May 5, 2010

Make:
technology on your time

Blog

MAKE Magazine

Videos/P

Make: Challenge

Experimental Science Kits for Space

Reminder: Don't forget that Saturday (April 30) is the deadline for the NASA Make: Challenge. Go here for [complete rules and guidelines for submissions](#). We can't wait to see what you're come up with!

MAKE Experimental Science Kits For Space

MAKE is happy to announce that we're partnering with Teachers in Space and NASA's Emerging Commercialization Space Office (ECSSO) to organize the first MAKE Challenge. The goal of this challenge is to develop inexpensive science kits that can be built in a classroom and then sent on-board suborbital flights to conduct experiments. The NASA MAKE Challenge promises to take advantage of DIY innovations to expand the number of experiments that are able to fly and increase our knowledge of space.

The deadline for submissions is April 30, 2011.

[NASA Make: Challenge complete rules and guidelines for submissions.](#)

Check out the webcast where Dale Dougherty hosts a Q+A with experts Kris Kimel, Twyman Clements, and James Kuhl:

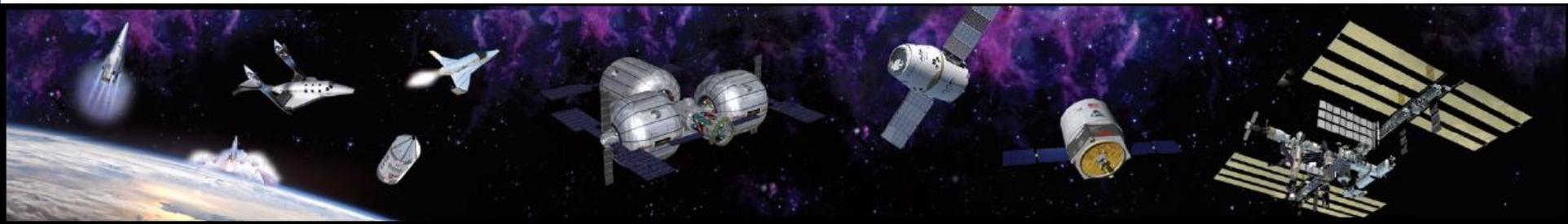
[NASA Make: Challenge Webcast](#)



What's Next?

Promote the New Space Economy

- Broaden the Uses of Space for **Public Benefit**
 - *Dramatically increase the number of minds using space*
 - *Make space as familiar a tool of the American classroom as the microscope*
 - *Support development of research parks on other worlds*
 - *Enable access to extraterrestrial resources*
- Establish a **21st Century NACA approach** for working with Emerging Space Companies
- Promote **innovation and opportunities** to strengthen our **Economic Security**





Proposal to Establish the

Planetary Sustainability Co-Laboratory (PSC)

Taking on the World's Greatest Challenges



SSV News/Updates



SSV Overview Video

Featured Partner: CLIMATE EARTH

Climate Earth's uses hybrid life cycle analysis methodology to link financial transactions to environment impacts, making sustainability management more effective.

[DESIGN FOR SUSTAINABILITY WORKSHOP - VIDEO](#)

[Marianna Grossman's Editorial](#)

[At Design for Sustainability Workshop](#)



Call for Solutions for Planetary Sustainability



Marianna Grossman
Executive Director, Sustainable Silicon Valley

Date: Oct 1 to Jan 31, 2013
Vote for Solutions: Feb 1 to Feb 22, 2013
Finalists Announced: March 7, 2013
Showcase Conference: May 23, 2013 (All Day)

[MORE INFORMATION](#)

[ENTER A SOLUTION](#)

The Challenge:



Our planet is facing un- precedented manmade challenges to long-term sustainability. NASA Ames Research Center and Sustainable Silicon Valley and partners are collaborating to showcase game-changing solutions for local and global sustainability. What scope and scale of change is required for a resilient future?

Enter your solution by January 31, 2013 and plan to join us on March 7 for the announcement of finalists and on May 23, 2013 for a conference on the challenges we face and how to mobilize solutions that will matter. Read on for a thought-provoking call to action...

Events

 **Call for Solutions for Planetary Sustainability (Deadline Jan 31, 2013)**

Oct 1 9:00 am [| more >](#)

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- [Google](#)
- [Integrated Building Solutions](#)
- [Sumitomo Electric](#)

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**This is more than
about space...**





... Its about the future

Backup Slides

Ames Has Been a Strong Advocate of Emerging Space

- Space Portal formed ad hoc in 2005 by senior NASA personnel
- **Works extensively with Emerging Space Companies**
 - SpaceX
 - Blue Origin
 - Masten
 - XCOR
 - Virgin Galactic
 - Google Lunar X-prize
 - Moon Express
 - Astrobotics
 - Fred Net
 - Kentucky Space



It's the Law

- **Legislative Authority for NASA's support of commercial space is derived from the Space Act of 1958 (as amended) and other legislative enablers to:**
 - *Facilitate NASA's support of entrepreneurial space ventures for the good of the nation.*
 - *Leverage commercial capabilities into new areas that benefit NASA and the public and increase NASA's and the public's ability to use space for discovery, development, education, and applications.*

"I now dream of the day when any American can launch into the vastness of outer space and see the magnificence and grandeur of our home planet, Earth, as I have been blessed to do." Charlie Bolden



Ames Has Been a Strong Advocate of Emerging Space

- Space Portal formed ad hoc in 2005 by senior NASA personnel



Lynn Harper: Thought Leader for Astrobiology



Bruce Pittman: Chair of the AIAA Commercial Space Working Group



Dan Rasky: NASA Inventor of the Year for PICA Heatshield





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NanoRacks Research Facilities

Our permanently installed, low-cost, hassle-free, standardized, plug-n-play facilities have vastly lowered costs for commercial space research users.

[Read More](#)

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Get updates



Latest Updates

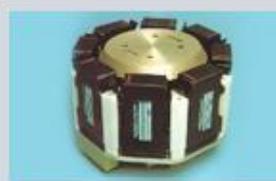
Recognition! - 25 July 2011



By Jeffrey Manber – NanoRacks thanks the folks over at the Space Frontier Foundation for awarding their 2011 "Vision to Reality" award to us. As Jim Muncy explained, this award is not for space companies that are solely business plans or viewgraphs but for those that have accomplished real world space operations with a proven [...]



A New Chapter Called Utilization - 21 July 2011



Astrium and NanoRacks Announce Centrifuge Agreement - 27 June 2011



NanoRacks Announces Completion of Seed Round of Financing - 20 June 2011

View [more updates](#) or subscribe to NanoRacks [email updates](#).

2011-2012 Customer Manifest

Our customers are continuously flying to the ISS - see upcoming launches below and check out

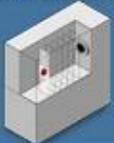
NANOLABS



PLATE READER



MICROSCOPE



MIXSTIX



Tweets **Updates** **Events**

Tags **Discussions** **Press**

RT @Spacevidcast: "Normal entrepreneurs pale to space advocates" - Bruce Pittman presenting the Vision to Reality award to NanoRacks, LL ... #

RT @spacecom: Jeffrey Manber (NanoRacks): If NASA uses traditional means to support one company, do they hurt ecosystem? #newspace2011 #

NanoRacks releases first post-shuttle customer manifest. www.nanoracks.com. Era of utilization underway. #

Follow [NanoRacks on Twitter](#).

August 2011						
M	T	W	T	F	S	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				
« Jul						Sep »

OCT-IPO: Emerging Space Plans & Strategy



- **Provide a focused capability within NASA for energizing new space industries -- Similar to the way NACA aided the early aeronautics industry.**
 - *Study, analyze and **develop recommendations** for agency leadership on how to **energize, enable and facilitate emerging space capabilities.***
 - *Provide a **friendly front door** to NASA for new space concepts and ideas.*
 - ***Interface** with Mission Directorates, field Centers across the Agency, entrepreneurs, early-stage ventures, traditional aerospace firms, and commercial space advocacy organizations*
 - *Actively explore new **public-private partnership approaches and strategies***
 - *Create **networks** to promote and facilitate new partnership opportunities.*
- **Establish a Level 2 Emerging Space Office at Ames to help IPO analyze, coordinate, and facilitate emerging space efforts.**
- **With funding from IPO, will carry out the following functions:**
 - *Participate as a member of the **NASA commercial space team.***
 - ***Identify potential opportunities** to foster new emerging space capabilities and industries to support NASA's missions, to promote economic growth, and to improve national security.*
 - *Recommend strategies and plans to **stimulate and support growth.***
 - *Serve as the **Center point of contact** for emerging space promotion activities, including acting as the Center interface with the emerging space community.*
 - ***Negotiate partnerships** with emerging space providers.*

A New Entrepreneurial Paradigm for the International Space Station

Workshop Summary and Synthesis

June 21-22, 2005

PRELIMINARY

7 July 2005

Rev 2

DRAFT

G.Scott Hubbard,
Director/ARC

L. Harper/SL

D. Rasky/TS

G. Schmidt/S

