

National Aeronautics and Space Administration



OFFICE OF THE CHIEF TECHNOLOGIST

SPACE TECHNOLOGY
INDUSTRY FORUM

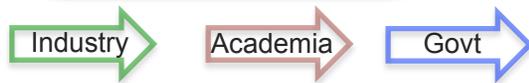
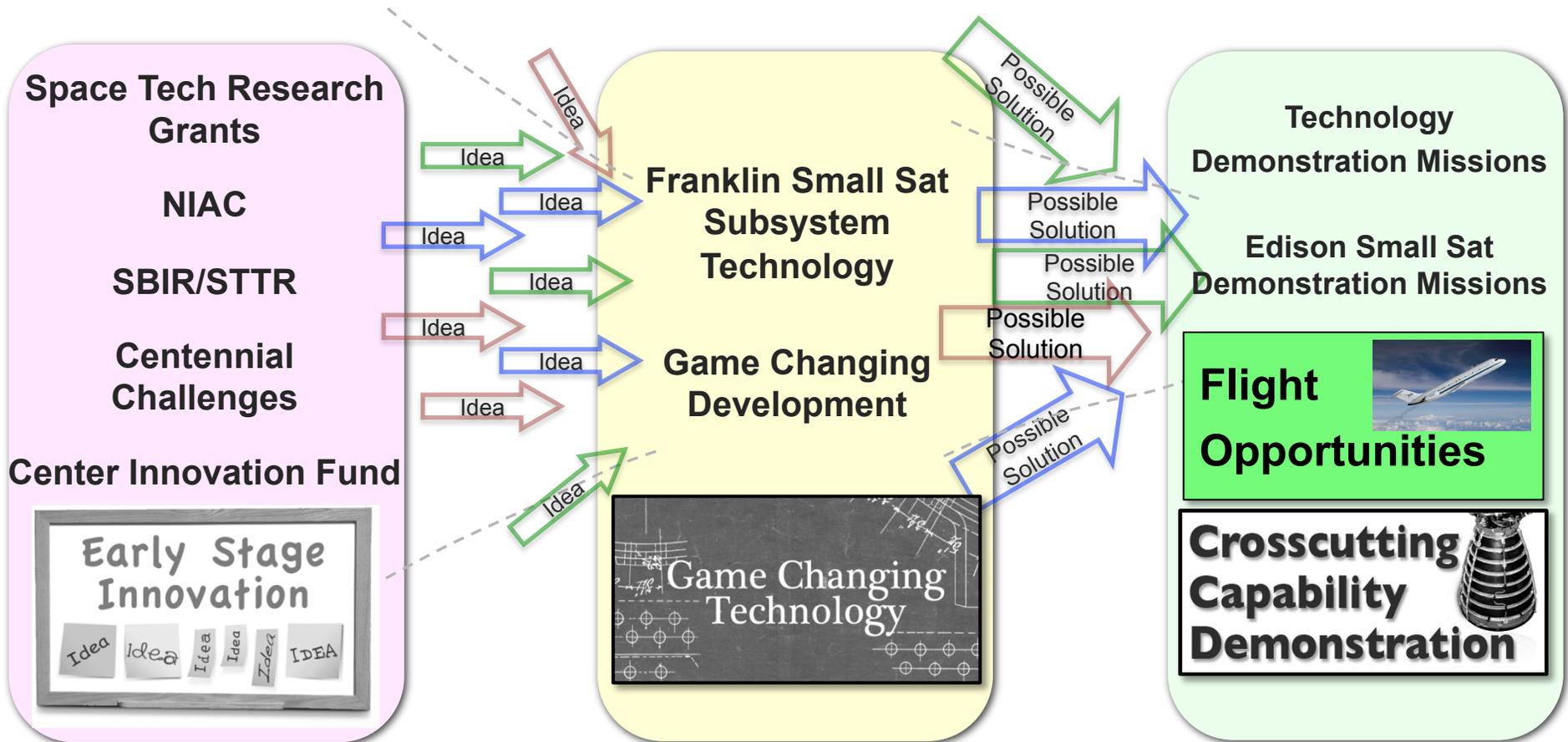
A woman in a dark jacket and pants stands on the right side of a yellow-toned, futuristic industrial or technological environment. The background is filled with complex machinery, pipes, and structural elements, creating a sense of depth and scale.

Flight Opportunities Program

Laguduva Kubendran
Program Executive (Acting)
July 13, 2010



OCT Program Overview



Technology Readiness Level (TRL)

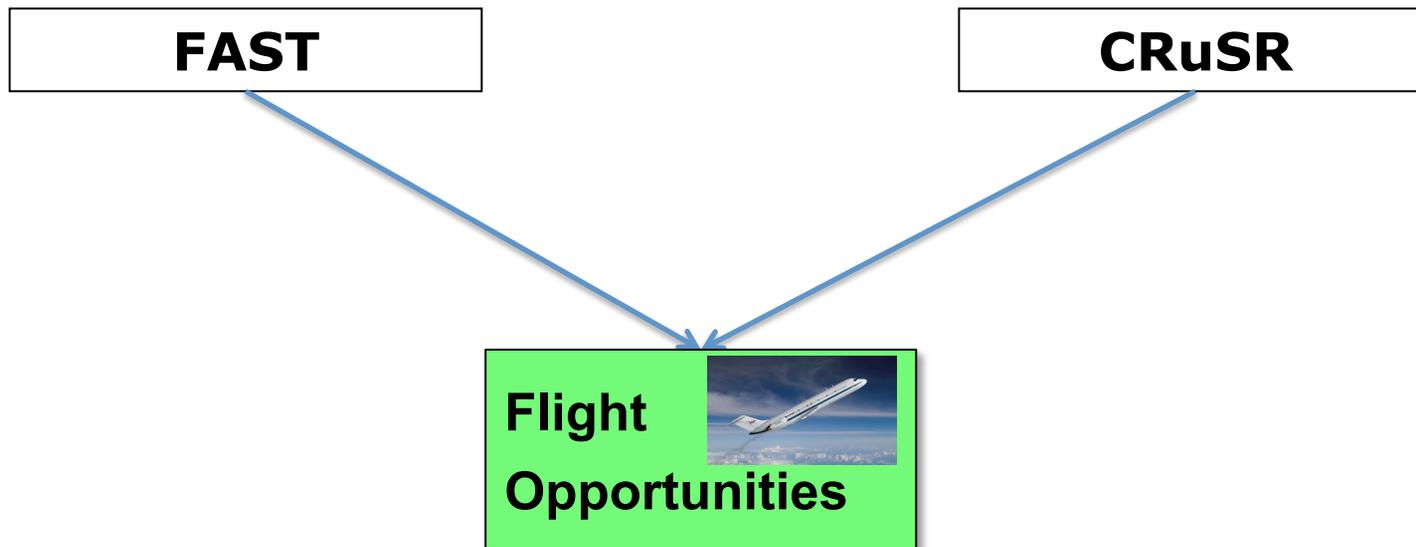
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Flight Opportunities - Overview



The Commercial Reusable Suborbital Research (CRuSR) activity and the Facilitated Access to the Space Environment for Technology (FAST) activity will be transitioned into the Flight Opportunities Program within the Office of the Chief Technologist in FY11.



Facilitated Access to the Space Environment for Technology (FAST)



**Access to 25 sec of microgravity across
40-60 parabolic paths**

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Past Participants in FAST

- First FAST Flight Week – August 11-12, 2008
 - Five SBIR projects
- Second FAST flight week - August 11-14, 2009
 - 19 projects – 2 flights with zero-g, 2 flights with lunar-g
 - Seven universities
 - Nine private companies (2 SBIR firms)
 - Five NASA Centers
- Third FAST flight week – September 27-Oct, 2010
 - 17 projects – with zero-g and lunar-g
 - Nine universities
 - Three private companies (1 SBIR firm)
 - Five NASA Centers

See details and updates at:

http://www.nasa.gov/offices/ipp/innovation_incubator/FAST/index

Next Call for Proposals – October 2010

Commercial Reusable Suborbital Research (CRuSR)



Virgin Galactic



Blue Origin



XCOR Aerospace



Armadillo Aerospace



Masten Space Systems

- Many approaches (horizontal & vertical take-off and landing)
- Significant private investment
- Designing for high flight rates & low cost operability
- Microgravity, pressurized, temperature-controlled payload environment

Current CRuSR Activities



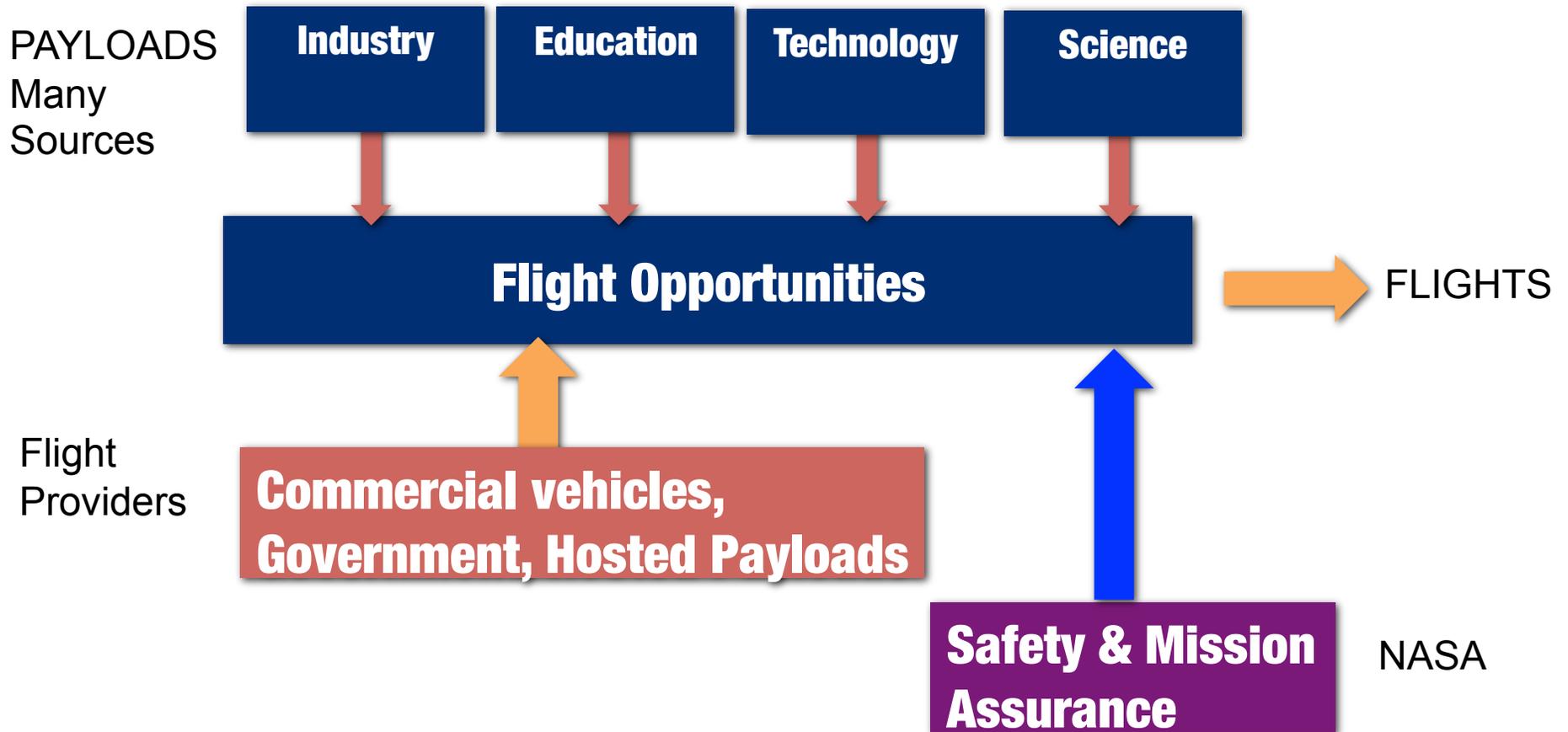
- CRuSR to procure space transportation services to provide 3-4 minutes of microgravity environment for tech development, scientific and university research
- RFI released: Suborbital providers submitted technical information about their vehicles
 - <http://crusr.arc.nasa.gov/platforms> for information on individual providers, including RFI responses
 - <http://crusr.arc.nasa.gov/files/CRuSR-SuborbitalPlatformCapabilitiesMatrix.xls> for a spreadsheet side-by-side comparison of the different providers
- Released RFQ to procure flight opportunities on early developmental commercial suborbital vehicles. <http://suborbitalex.arc.nasa.gov/node/284>
- Approx. \$300K available for awards (~2-4 awards; Sept 2010 start anticipated)
- Early flights will:
 - Develop standardized processes and procedures
 - Detail interfaces and logistical operations
 - Payloads will include:
 - » Environmental monitors to characterize the vehicle operational flight environment (acceleration, vibrations, quality of microgravity)
 - » An FAAADS-B payload meant to broadcast position and velocity information to air traffic controllers and other aircraft in real time
 - » Berkeley / SETI payload to improve understanding of the electrostatic behavior of granular materials

RFQ Due Date July 20, 2010

July 13, 2010

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Flight Opportunities - Facilitating Access to the Space Environment



Level II Program Office @ NASA Dryden Flight Research Center
- Working with NASA Ames in payload accommodation

Fly Early – Fly Often – Fly Safely

July 13, 2010

Opportunities for Commercial Suborbital Flights



- **FY 11:** The Program will competitively procure suborbital flights on commercial vehicles to develop standards (e.g. characterize the payload environment, safety, interfaces, etc.)
 - Approximately \$11M available for multiple awards
 - Expect to supplement FY10 RFQ awards
 - Number of awards dependent on readiness level of providers
 - Solicit peer-reviewed science payloads through 2010 SMD ROSES NRA for commercial vehicle flight opportunities
 - <http://science.nasa.gov/researchers/sara/grant-solicitations/>
 - Solicit technology development payloads through OCT Game Changing Technologies and other sources within OCT
- **FY12:** The Flight Opportunities Program will competitively secure commercial suborbital flight services for technology, science, and education payloads
 - Focus on payloads that reduce risk for use of new technologies in future missions

Participants bring payloads; NASA pays for flight

Opportunities for Parabolic Flights



FY11/FY12

- The parabolic flights will test technologies in a space environment that could simulate microgravity and the reduced gravity environments of the Moon or Mars
- Approximately \$2M available for awards:
 - ~4 flight weeks/year
 - Each flight provides 40-60 parabolas; participants typically receive several flights
 - ~15 payloads flown/flight week
 - Next Call for Proposals – October 2010

Participants bring payloads; NASA pays for flight

Questions?



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