NASA's Flight Opportunities Program Technology Development on Parabolic and Suborbital Flights

Laguduva "LK" Kubendran / HQ – Program Executive
John Kelly / DFRC – Program Manager

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Office of the Chief Technologist/Space Technology

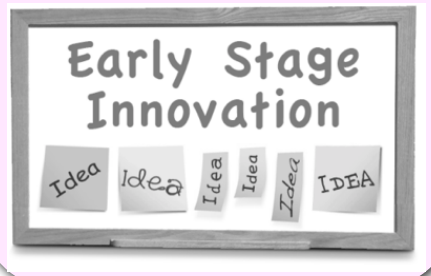
Space Tech Research Grants

NIAC

SBIR/STTR

Centennial Challenges

Center Innovation Fund



Idea

Idea

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Idea

Franklin Small Sat Subsystem Technology

Game Changing Development

Possible Solution

Possible Solution

Possible Solution

Possible Solution

Possible Solution

Technology Demonstration Missions

Edison Small Sat Demonstration Missions

Flight Opportunities

Crosscutting Capability Demonstration

Industry Academia Govt

1	2	3	4	5	6	7

Technology Readiness Level (TRL)

Program Rationale, Goals, and Objectives

Program Rationale

- Bridge the gap between testing space technology in a laboratory environment and demonstrating it in a mission-relevant operational environment
- Use suborbital research to train future science/exploration workforce

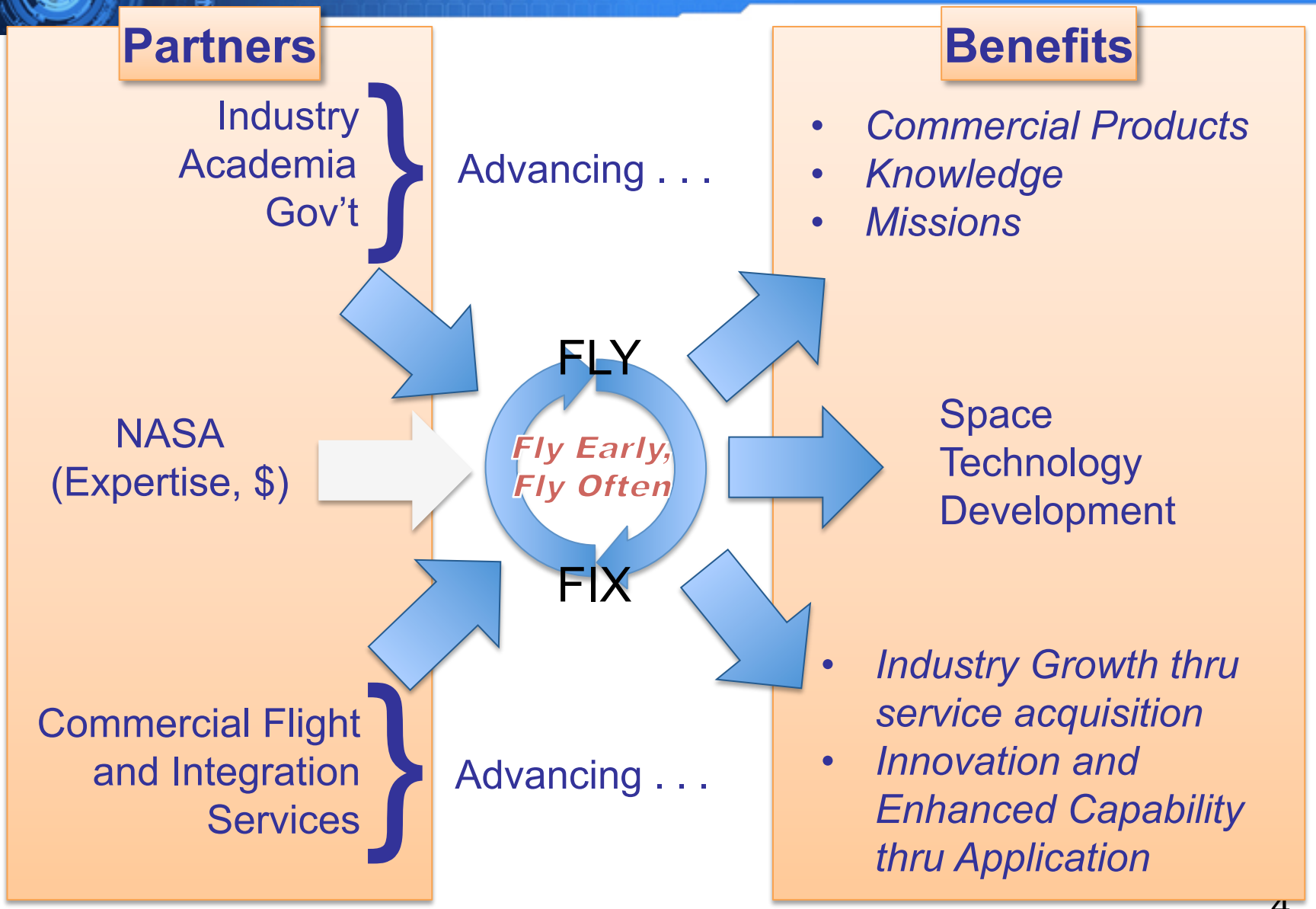
Program Goals

- Facilitate the maturation of technology payloads to higher TRL's through flights in relevant environment
- Foster growth in the emerging commercial suborbital platform industry
  - Secure the services of as many vendors as possible;
  - Secure frequent flight opportunities to accommodate technology payloads

Program Objectives

- Provide flight opportunities in reduced-gravity and high-altitude environments toward maturation of technology for application in future space missions.
  - Provide 3-4 minutes of microgravity environment using commercial suborbital Reusable Launch Vehicles (sRLVs)
  - Provide 20-25 seconds of microgravity and reduced gravity environment of the Moon/Mars using commercial parabolic aircraft

The Value Proposition . . .

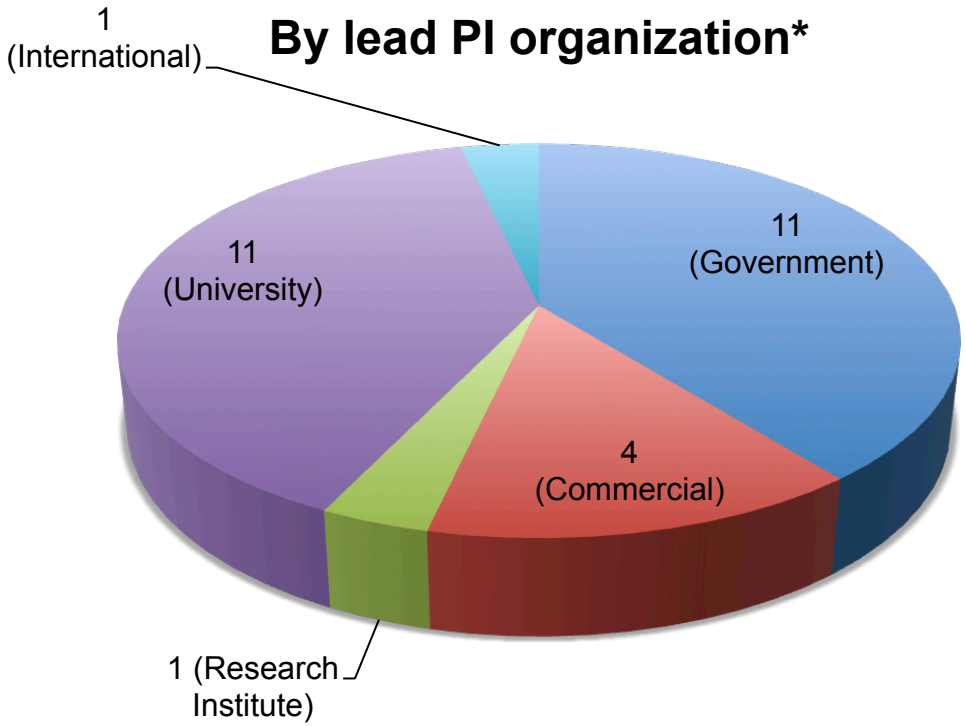


Payload Pool Status

Total payloads in program: 28

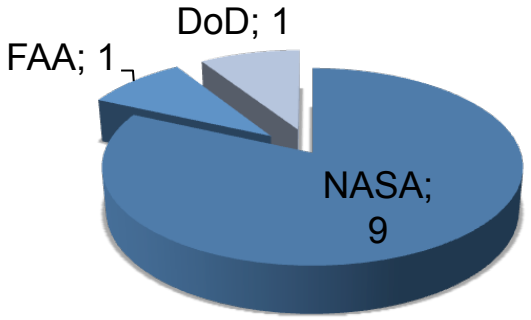
As of January 2012

By lead PI organization*



*** Various PI teams includes public-private partnerships**

Government customers



Announcement of Flight Opportunities

- Announce Opportunities for Parabolic Flights and sRLV Flights, including dev. flights
- Released on December 21, 2010
- Open Call until December 31, 2014
  - Hosted on NSPIRES
  - http://flightopportunities.nasa.gov/afo
  - Evaluation criteria
    - Applicability to OCT Technology areas (Roadmaps)
    - Risk reduction
    - Current TRL
    - Benefit to OCT (Demonstration & Transition)
    - Readiness to fly
    - Experience of team
  - Awarded as unfunded Space Act Agreements or MOA's

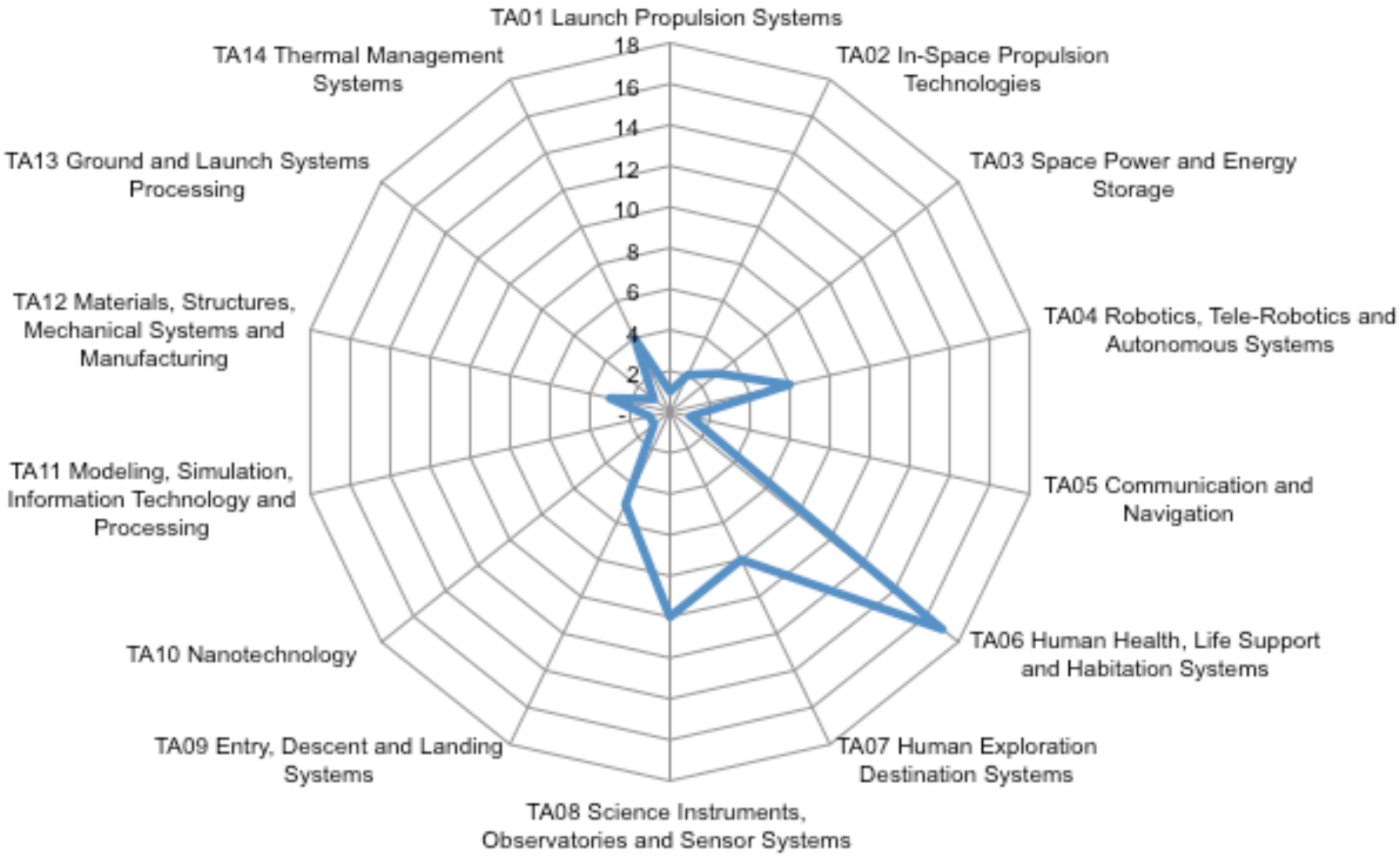
Next Opportunity Window Opens in Mar 2012

Payload Selection Status

AFO #	Released	Closed	Selection	# Proposals selected
AFO 1	Dec 21, 2010	Feb 23, 2011	May 13, 2011	**16** - 12 parabolic - 2 sRLV - 2 parabolic + sRLV
AFO 2	June 6, 2011	June 28, 2011	Oct 4, 2011	**9** - 4 parabolic - 4 sRLV - 1 parabolic + sRLV
AFO 3	Nov 16, 2011	Dec 16, 2011	*tbd*	*tbd*
TOTAL TO DATE				***25 + tbd***

AFO: Announcement of Flight Opportunities

AFO3 Proposals Map to ALL OCT Technology Areas



Flight Opportunities Accomplished to Date

- 3 parabolic flight weeks in the summer of 2011
- Total of 20 payloads flown
- 4 payloads flew multiple times with short iteration interval

	July 2011	August 2011	September 2011	TOTAL
First flight	9	-	4	13
Reflights from July	-	4	3	7

Total flown: 20

- Program will continue to offer re-flight opportunities
- 3 parabolic flight weeks planned for 2012

Concluding Remarks

- Short-Term Plan
  - Enable steady stream of payloads
  - Utilize commercial vehicles and Government platforms
- Long-Term Plan
  - Provide frequent flight opportunities that would enable incremental technology development at a fast pace
  - Continue to offer new opportunities for the next generation of technologists and space scientists