



Investing in the Future`: NASA's Technology Programs

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Office of the Chief Technologist
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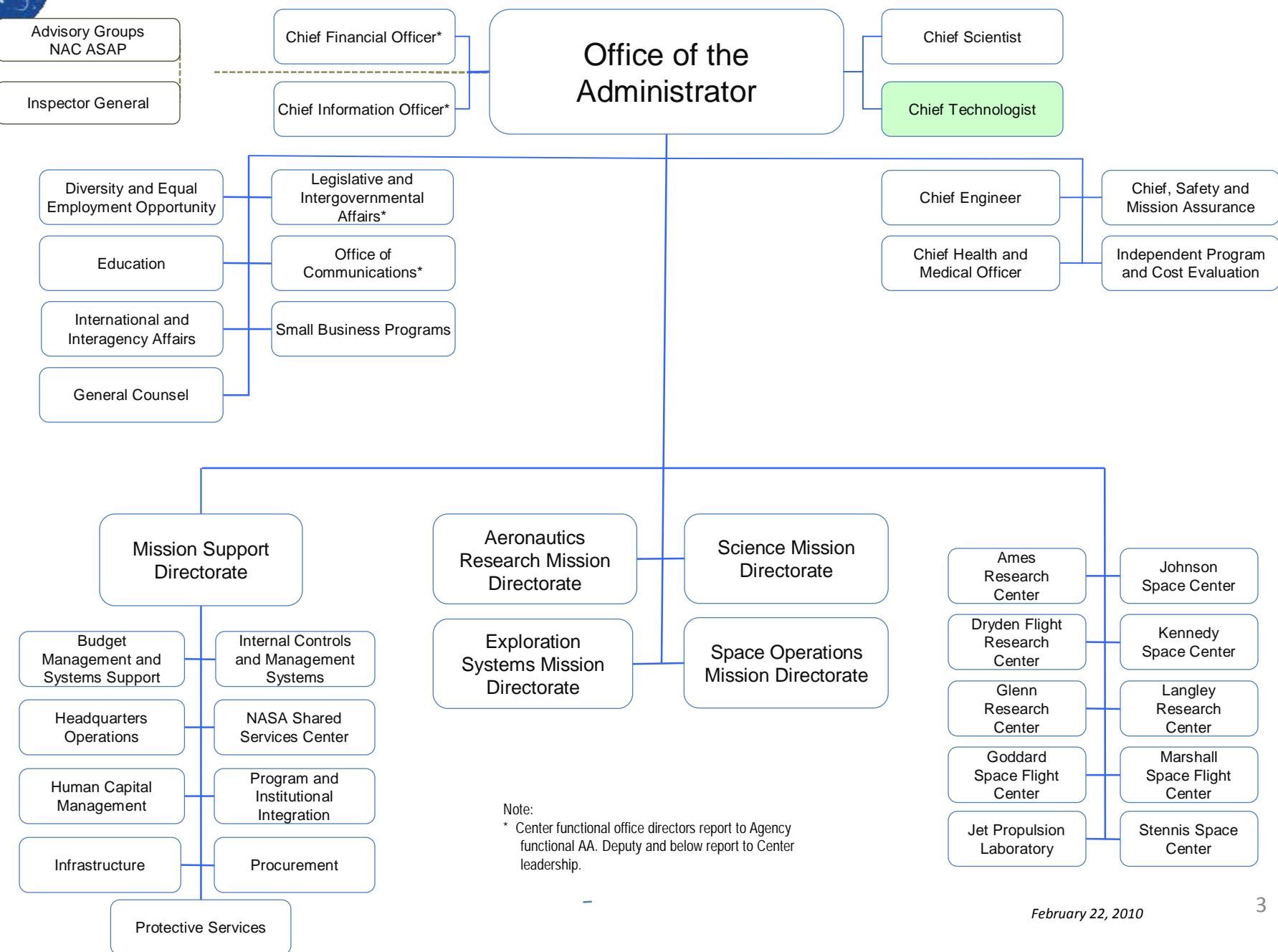


NASA's SBIR Program is on the move

- Starting in FY201, the SBIR and STTR programs are integrated into the Office of the Chief Technologist (OCT)
 - The goals, objectives remain the same:
 - Providing the high tech small business sector with an opportunity to develop technologies for NASA
 - Commercializing those technologies to spur economic growth
 - The Space Technology Program, managed by OCT, will increase the opportunities for SBIR/STTR activities to continue to mature over the “valley of death” and be infused into NASA’s missions and project through new competitive opportunities
 - Increased emphasis on extramural R&D will increase SBIR/STTR allocation



National Aeronautics and Space Administration



Note:

- * Center functional office directors report to Agency functional AA. Deputy and below report to Center leadership.



Office of Chief Technologist

Roles/Responsibilities

OCT has six main goals and responsibilities:

- 1) Principal NASA advisor and advocate on matters concerning Agency-wide technology policy and programs.
- 2) Up and out advocacy for NASA research and technology programs. Communication and integration with other Agency technology efforts.
- 3) Direct management of Space Technology program.
- 4) Coordination of technology investments across the Agency, including the mission-focused investments made by the NASA mission directorates. Perform strategic technology integration.
- 5) Change culture towards creativity and innovation at NASA Centers, particularly in regard to workforce development.
- 6) Document/demonstrate/communicate societal impact of NASA technology investments. Lead technology transfer and commercialization opportunities across Agency.

- Mission Directorates continue to manage mission-focused technology for directorate missions and future needs
- Beginning in FY 2011, activities associated with the Innovative Partnerships Program are integrated into the Office of the Chief Technologist

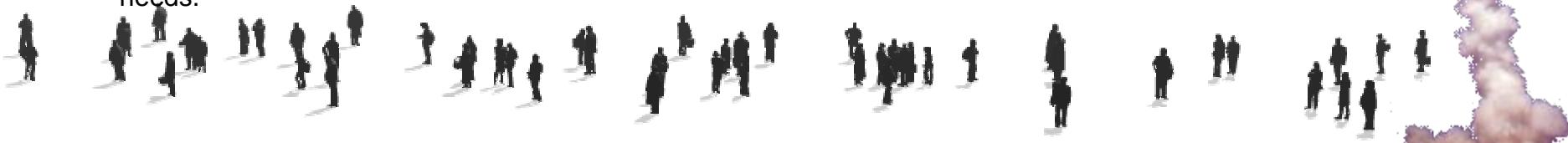


NASA Space Technology Program

Visions of the Future



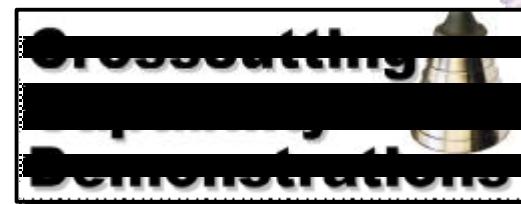
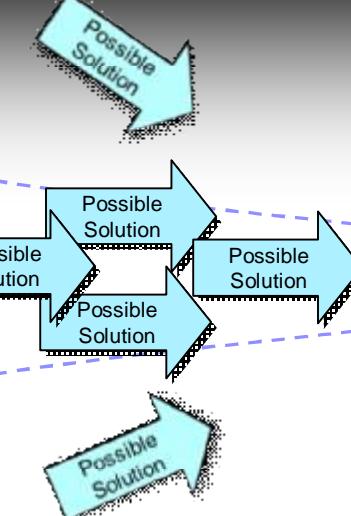
Creative ideas regarding future NASA systems and/or solutions to national needs.



Does it WORK?



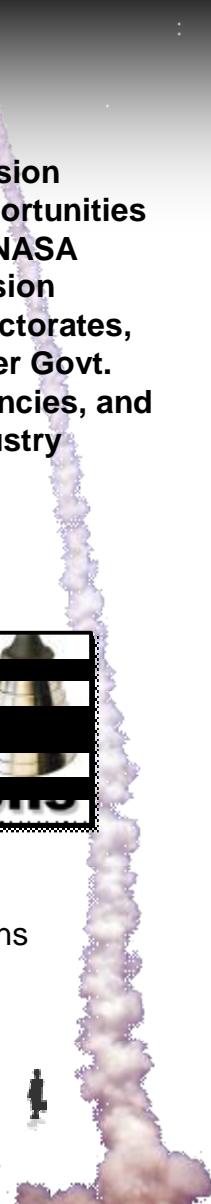
Prove feasibility of novel, early-stage ideas with potential to revolutionize a future NASA mission and/or fulfill national need.



Mature crosscutting capabilities that advance multiple future space missions to flight readiness status

Is it Flight Ready?

Infusion Opportunities for NASA Mission Directorates, Other Govt. Agencies, and Industry





NASA Space Technology Program

Foundational Principles

- The Space Technology Program shall
 - Advance non-mission-focused technology.
 - Produce technology products for which there are multiple customers.
 - Meet the Nation's needs for new technologies to support future NASA missions in science and exploration, as well as the needs of other government agencies and the Nation's space industry in a manner similar to the way NACA aided the early aeronautics industry.
 - Employ a portfolio approach over the entire technology readiness level spectrum.
 - Competitively sponsor research in academia, industry, and the NASA Centers based on the quality of the research proposed.
 - Leverage the technology investments of our international, other government agency, academic and industrial partners.
 - Result in new inventions, new capabilities and the creation of a pipeline of innovators trained to serve future National needs
- Crosscutting technologies* that may be solicited by this program include lightweight structures and materials, advanced in-space propulsion, nano-propellants, lightweight large aperture space systems, power generation/transmission systems, energy storage systems, in-space robotic assembly and fabrication systems, high bandwidth communications, and inflatable aerodynamic decelerators.

*This list is exemplary, not inclusive. 6



NASA Space Technology Program Elements

1) Early-Stage Innovation: Creative ideas regarding future NASA systems and/or solutions to national needs.

- NIAC2
- Space Technology Research Grants (includes Fellowship program)
- SBIR/STTR
- Centennial Challenges
- Center Innovation Fund

2) Game Changing Technology: Prove feasibility of novel, early-stage idea that has potential to revolutionize a future NASA mission and/or fulfill national need.

- Game Changing Development
- Small Satellite Subsystem Technology

3) Crosscutting Capability Demonstration: Maturation to flight readiness of cross-cutting capabilities that advance multiple future space missions, including flight test projects where in-space demonstration is needed before the capability can transition to direct mission application.

- Crosscutting Technology Demonstrations
- Edison Small Satellite Demonstration Missions
- Flight Opportunities

*Both competitive and guided program approaches will be used in the Game Changing Technology and Crosscutting Capability Demonstration program elements. The Early-Stage Innovation program element will be entirely competed.



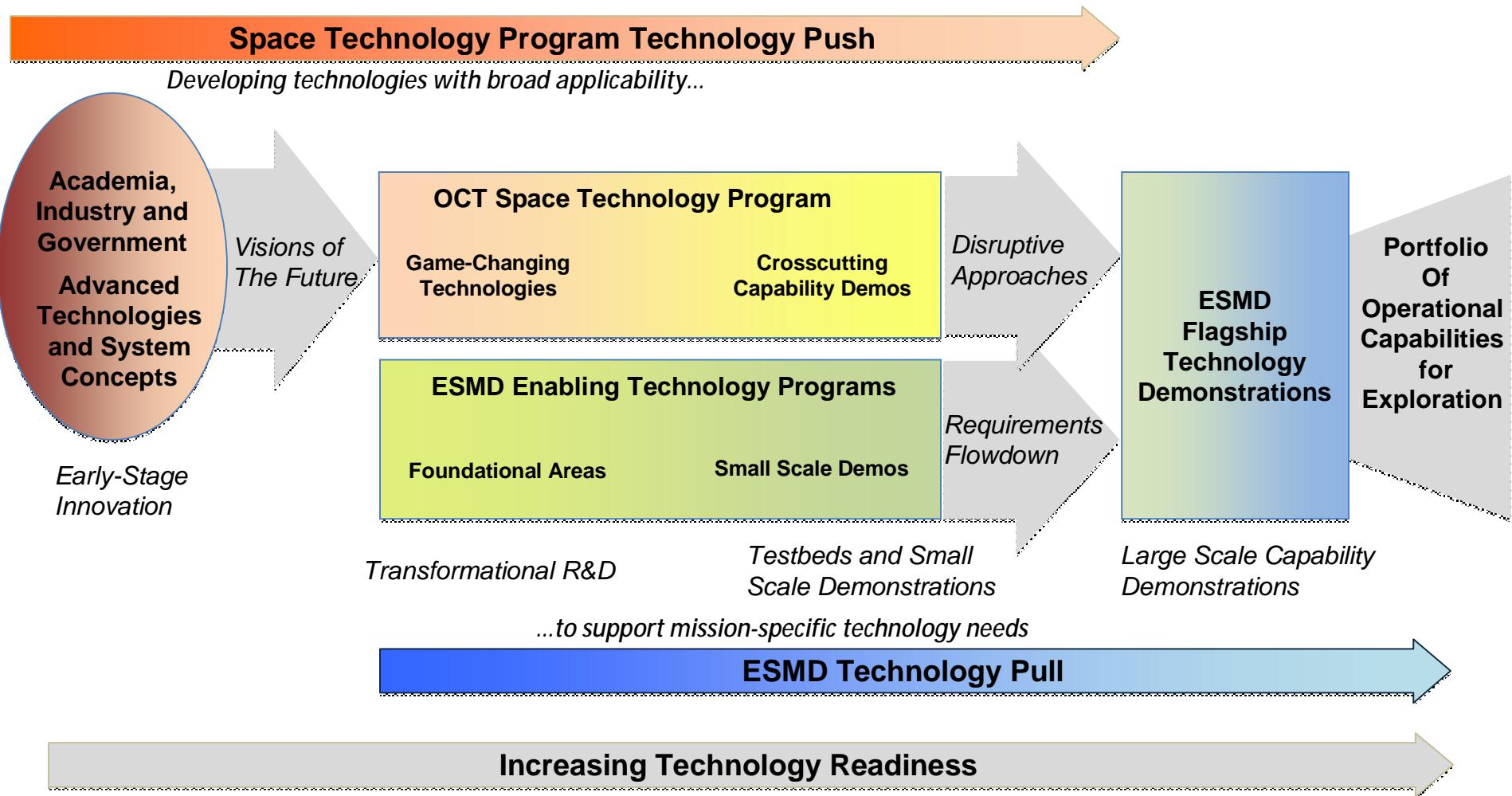
NASA Space Technology Program Elements

TRL	1	2	3	4	5	6	7
	Early-Stage Innovation <ul style="list-style-type: none">• System Concepts and Analyses• Foundational Disciplinary Advances• Technology Enablers• Benefits/Feasibility Assessments						
			Game-Changing Technology <ul style="list-style-type: none">• New Capabilities (Systems & Subsystems, Not Components)• Large Scale• Quantitative Performance• Hardware Validation• Risk Results in Moderate Failure Rate				
					Crosscutting Capability Demo. <ul style="list-style-type: none">• Relevant Environment Testing• 7120 Flight Processes• Not Mission Specific Technology• 25% Cost Share Req. for Flight Tests		



NASA's Integrated Technology Programs

- A portfolio of technology investments which will enable new approaches to NASA's current mission set and allow the Agency to pursue entirely new missions of exploration and discovery.





Space Technology Program Element Proposed Budget

Major Space Technology Program Elements	FY11	FY12	FY13	FY14	FY15
Early Stage Innovation	298.6	304.4	300.4	305.1	314.7
Game Changing Technology	129.6	359.3	349.1	349.1	424.2
Crosscutting Capability Demonstrations	102.0	302.0	362.0	362.0	424.0
Partnership Development and Strategic Integration	42.0	46.5	48.2	47.7	55.0
	572.2	1012.2	1059.7	1063.9	1217.9

Space Technology Program	FY11	FY12	FY13	FY14	FY15
Partnership Development and Strategic Integration	42	46.5	48.2	47.7	55
Early Stage Innovation					
a) Space Technology Research Grants	70	70	70	70	70
b) NIAC Phase I and Phase II	3	6	7	7	8
c) Center Innovations Fund	50	50	50	50	50
d) SBIR/STTR	165.6	168.4	163.4	168.1	176.7
e) Centennial Challenges	10	10	10	10	10
Game Changing Technology					
a) Game-changing developments	123.6	329.3	319.1	319.1	394.2
b) Small satellite subsystem technologies	6	30	30	30	30
Crosscutting Demonstrations					
a) Technology demonstration missions	75	265	325	325	387
b) Small satellite demonstration missions	10	20	20	20	20
c) CRuSR/FAST	17	17	17	17	17
Subtotal	572.2	1012.2	1059.7	1063.9	1217.9



Summary

NASA as a Major Component of our Nation's Innovation Engine:

- America's economic competitiveness and high standard of living are based on decades of investment in innovation
- Investment in innovation in NASA communities will drive a sustainable, yet aggressive, future mission portfolio
- Innovative research and technology, tied to exciting missions with national importance, is a strong motivator for students in STEM disciplines, and a strong attraction for new hires
- This investment will also allow NASA to participate in the development of technological solutions addressing broader National needs in energy, weather & climate, Earth science, health & wellness, and National security
- NASA's focus on innovation and technology will:
 - Be responsive to Augustine and NRC input
 - Position NASA for human exploration beyond low earth orbit
 - Be highly engaging of our academic and industrial partners, and the emerging commercial space sector
 - Leverage efforts of other government agencies and international partners
 - Result in new inventions, new capabilities and creation of a pipeline of innovators trained to serve future national needs