National Aeronautics and Space Administration

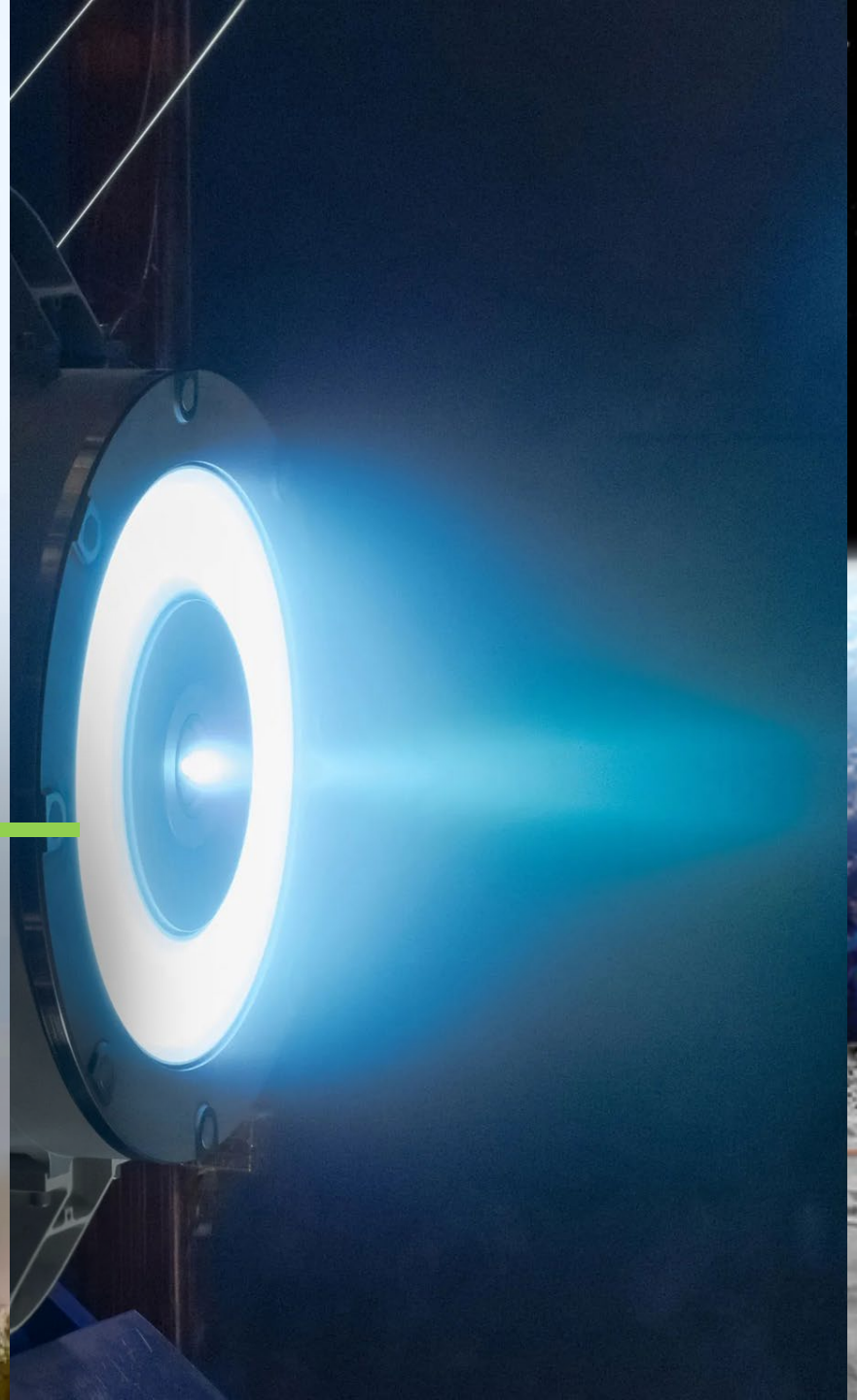
Tech Base Philosophy

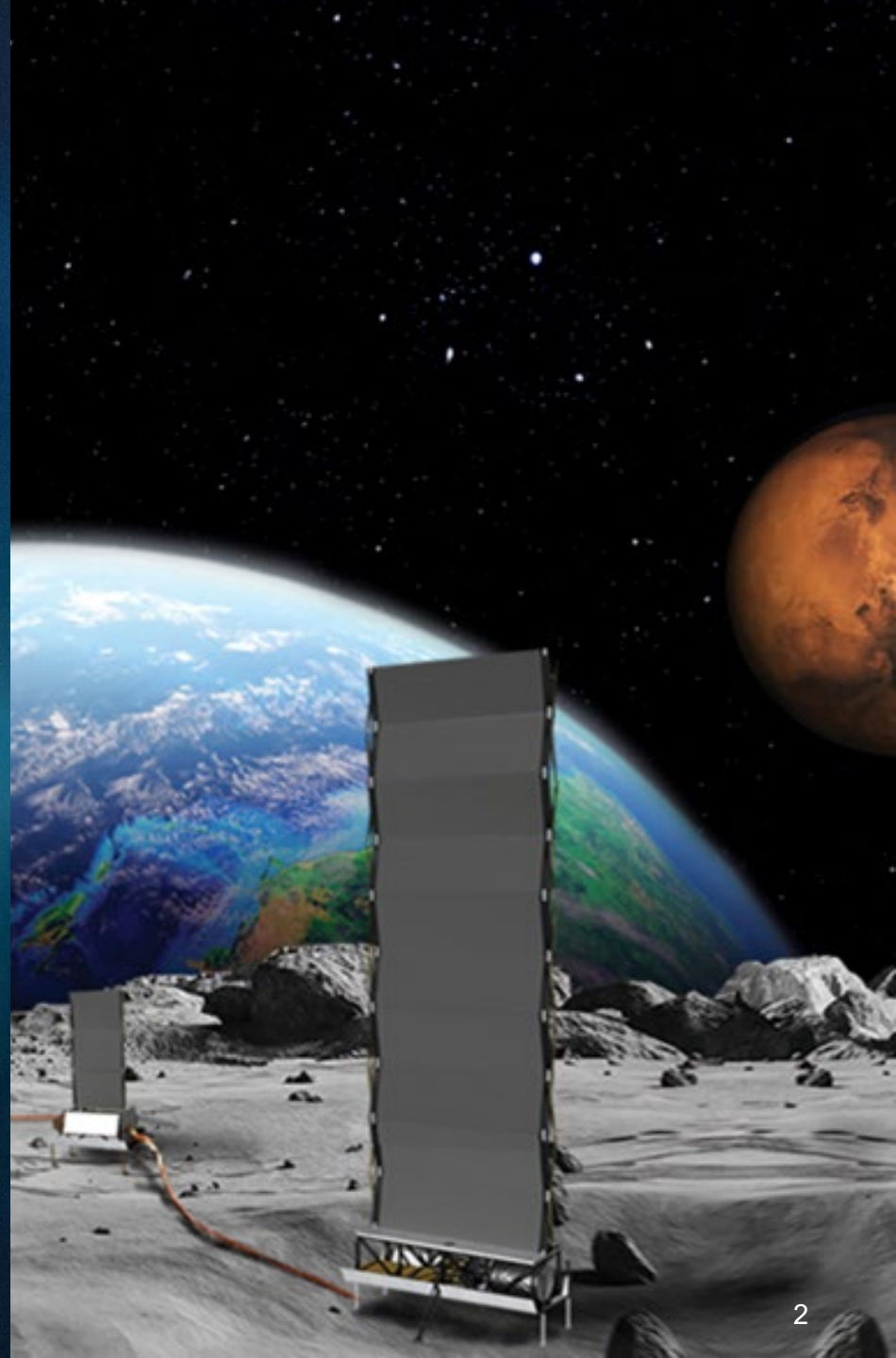
Aeronautics and Space Engineering Board

June 12, 2024

Dr. Kurt “Spuds” Vogel

NASA Associate Administrator for Space Technology





Tech Base Philosophy

SET PRIORITIES

Tech Base Philosophy

TUNE-IN TO YOUR STAKEHOLDERS

Tech Base Philosophy

HAVE AN AUDIT TRAIL

National Tech Base Priorities

Publicly-transparent, rigorously-developed process by which we establish our priorities based on comprehensive prioritized needs of our stakeholders

Idea Generation

OGAs

Industry

Academia

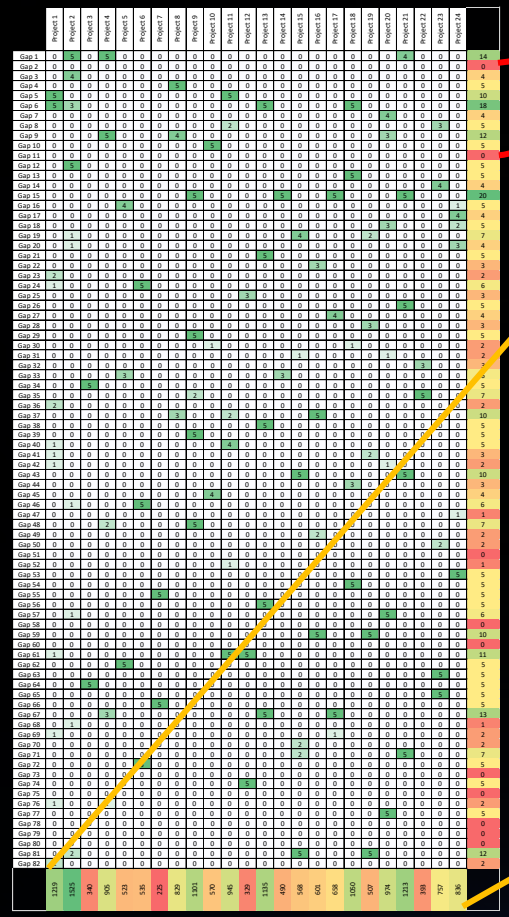
EOP

Hill

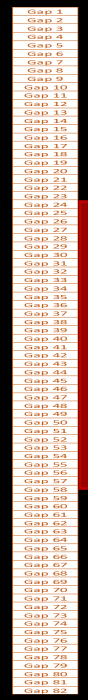
Mission Directorates

Centers

Investments/Projects



Prioritized Shortfalls (Gaps)



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Prioritized Shortfalls (Gaps)

Project 2	1525
Project 1	1219
Project 21	1213
Project 13	1135
Project 9	1101
Project 18	1050
Project 20	974
Project 11	945
Project 4	905
Project 24	836
Project 8	829
Project 23	757
Project 17	658
Project 16	601
Project 10	570
Project 15	568
Project 6	535
Project 5	523
Project 19	507
Project 14	490
Project 22	393
Project 3	340
Project 12	329
Project 7	225

$$$

Roadmaps

Initial Tech Status

Capability Goals

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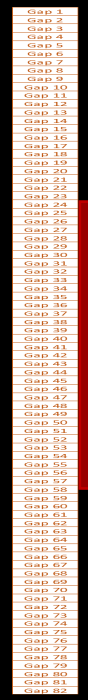

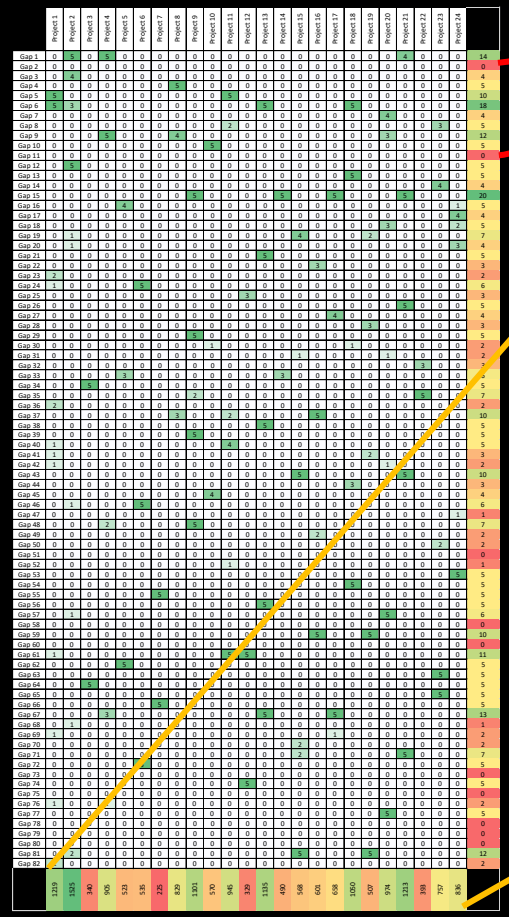

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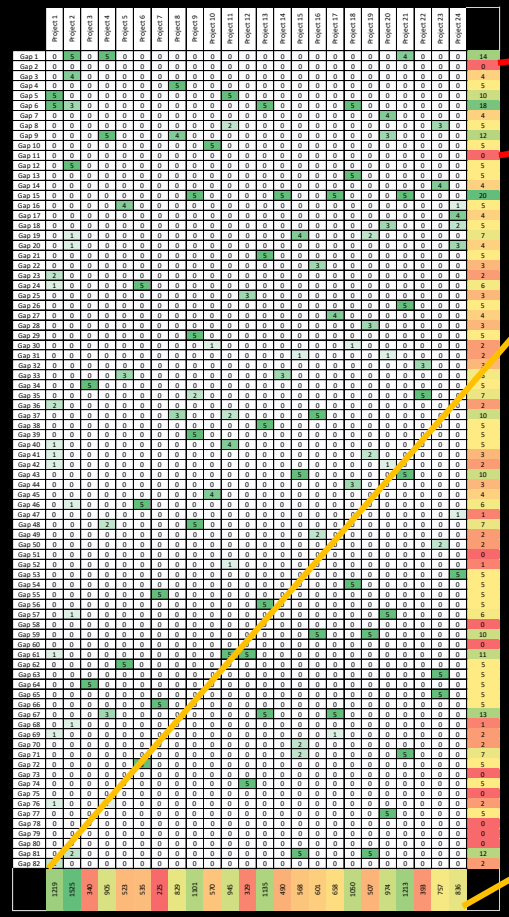

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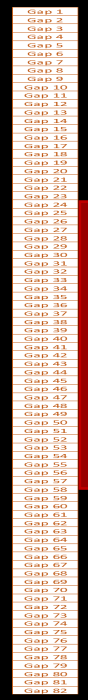

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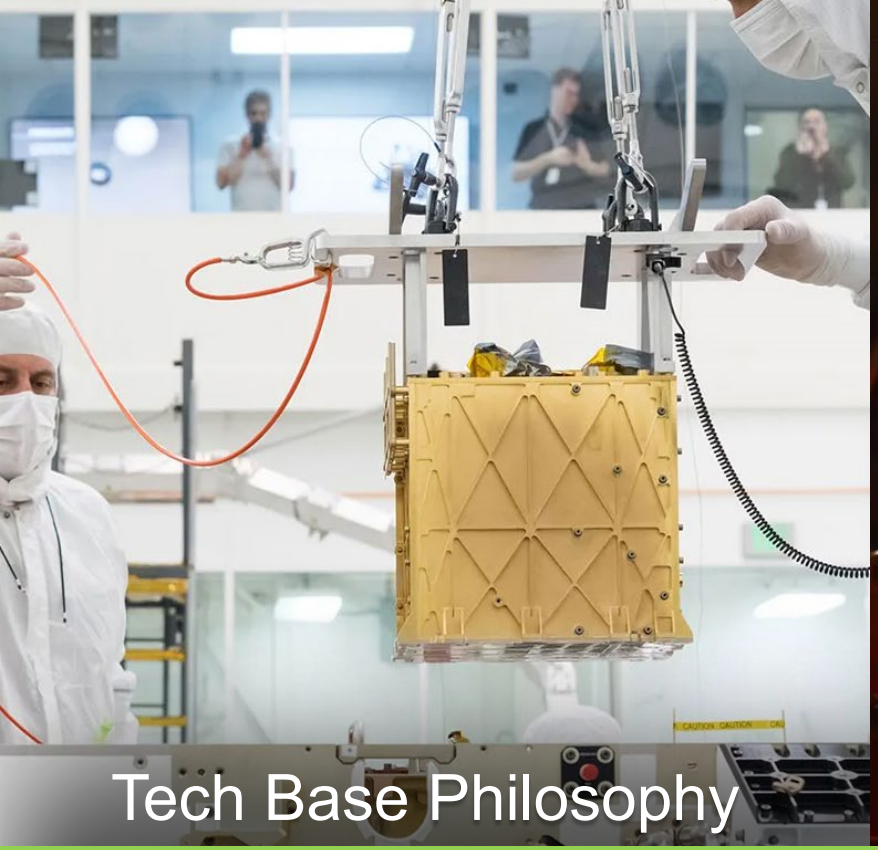
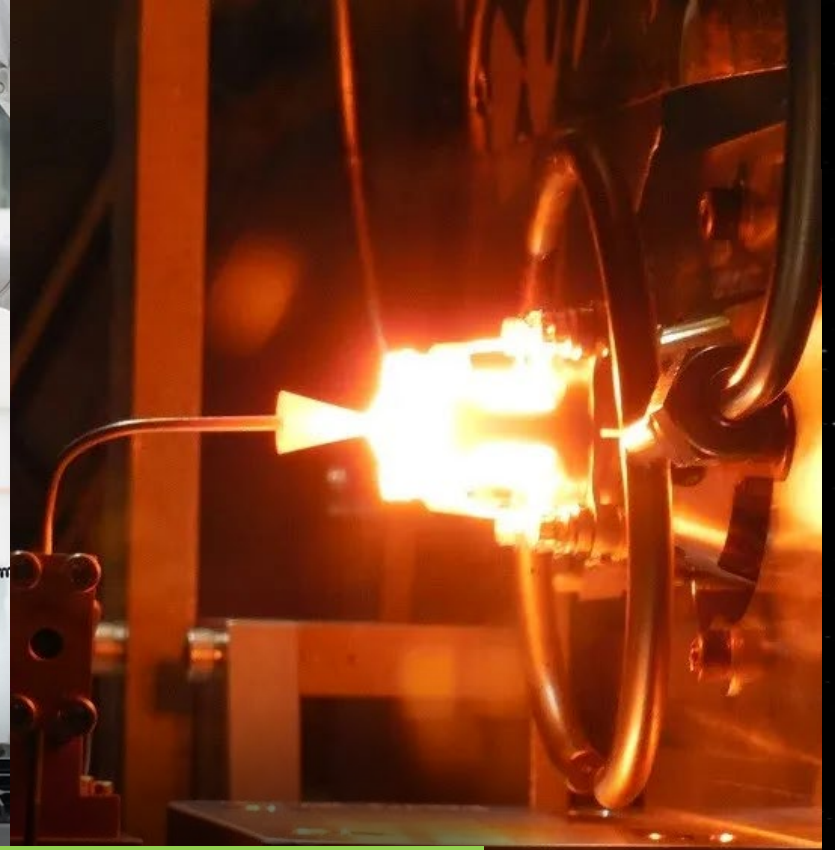
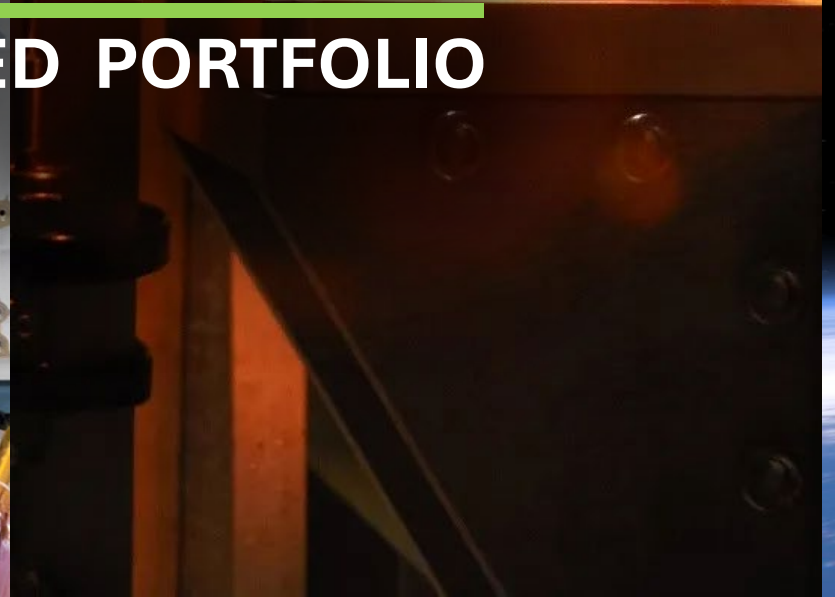
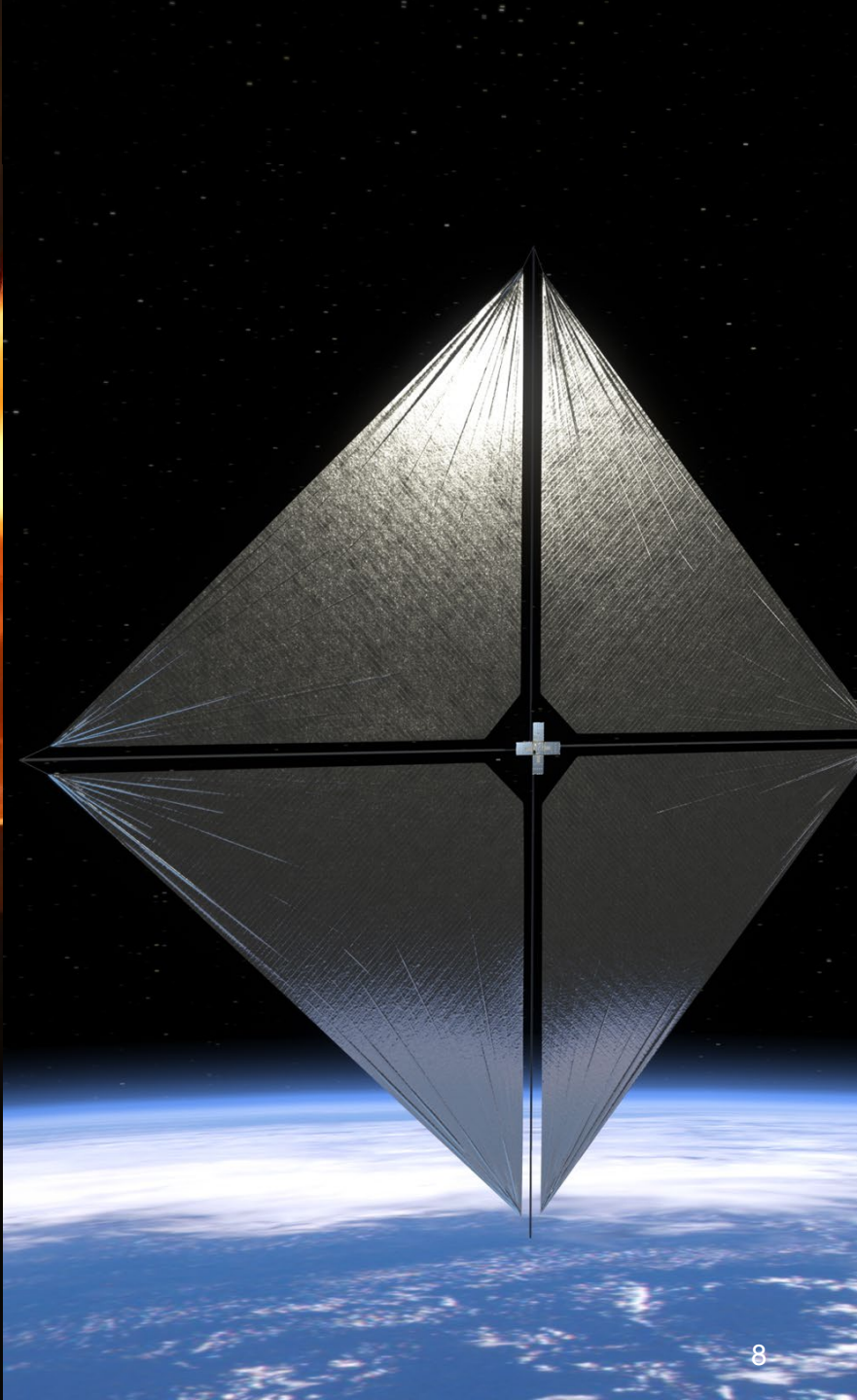








Tech Base Philosophy

MAINTAIN A BALANCED PORTFOLIO

Tech Base Philosophy

TAKE RISKS & THINK CRITICALLY

Image Credit: ICON

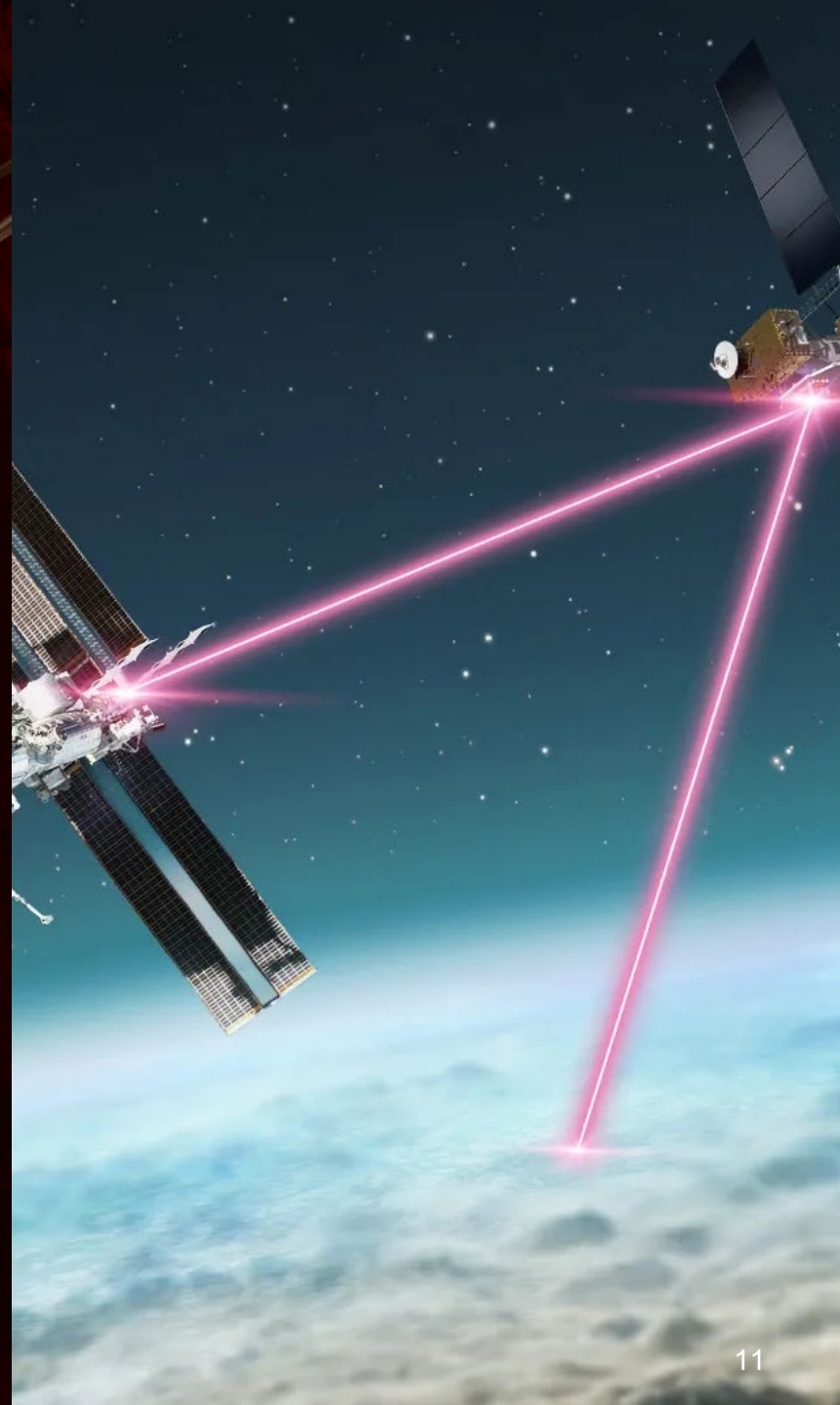
Tech Base Philosophy

DON'T FRET ABOUT THE BUDGET

Tech Base Philosophy

MANAGE ACROSS THE TRL SPECTRUM

Image Credit: Marco Pavone



Tech Base Functional Domains

GO
Space Transportation

- Advanced Propulsion
- Nuclear Propulsion
- Flight Vehicle Systems (including Ascent Systems)
- Cryogenic Fluid Management

LAND
Space to Surface Operations

- Deceleration Systems
- Guidance & Nav Systems
- Landing Systems & Environments
- Entry Modeling & Instrumentation

LIVE
Surface Infrastructure/ Exploration

- Surface Power
- In Situ Resource Utilization
- Surface Habitation Systems
- Surface Structures & Construction
- Surface Mobility & Transportation
- Surface Sustainability & Logistics
- Dust Mitigation & Environments

EXPAND
In-Space Infrastructure/ Discovery

- Observation Systems
- Comm & PNT
- In-Space Sustainability
- Small Spacecraft & Distributed Systems
- ISAM

ENABLE
Foundational Capabilities

- Avionics & Sensors
- Robotics & Autonomy
- Advanced Materials, Structures & Manufacturing
- Advanced Power Thermal

❖ Capability Portfolio

CATALYSTS
Tools and Mechanisms

- Flight Opportunities
- TP/ACO
- Tech Transfer
- SBIR/STTR
- NIAC/CIF/ECI
- STRG
- ESIC
- PCC
- Future Tools

Civil Space Shortfalls

- Inaugural feedback opportunity closed May 13
- 1,200 internal and external responses received
- Data processing underway
- Results coming soon
- Refining process and timeline for future years

STMD FY 2025 PBR Summary ($M)	FY 2023 Op Plan	FY 2024 CR	FY 2025 PBR	FY 2026	FY 2027	FY 2028	FY 2029
	1,193.0	1,200.0	1,181.8	1,205.4	1,229.5	1,254.1	1,279.2
SBIR and STTR	**231.7**		**241.8**	**246.6**	**251.6**	**256.7**	**261.9**
Early Stage Innovation and Partnerships	**122.0**		**140.1**	**145.1**	**149.6**	**154.2**	**160.4**
Agency Technology and Innovation	**1.4**		**-**	**-**	**-**	**-**	**-**
Technology Transfer	**21.5**		**23.1**	**23.6**	**24.1**	**24.6**	**25.1**
Early Stage Innovation	**99.1**		**117.0**	**121.5**	**125.5**	**129.6**	**135.4**
Early Stage Innovation and Commerce	2.9		5.3	5.4	5.4	5.5	5.6
Early Career Initiative (ECI) and Center Innovations Fund (CIF)	24.4		28.4	31.0	33.4	35.2	37.1
Prizes, Challenges and Crowdsourcing	11.1		12.0	12.5	12.7	13.7	15.8
NASA Innovative Advanced Concepts (NIAC)	7.2		9.6	9.8	10.0	10.1	10.5
Space Technology Research Grants (STRG)	53.5		61.6	62.8	64.0	65.2	66.3
Technology Maturation / Game Changing Development (GCD)	**323.9**		**340.8**	**353.2**	**363.1**	**370.4**	**377.8**
Space Transportation	17.6		30.3	17.3	14.0	14.0	18.0
Entry, Descent and Landing	37.8		19.7	21.2	20.2	20.0	21.1
Sustainable Exploration	131.6		189.9	196.1	180.8	184.2	185.4
Transformative Missions and Discoveries	62.4		37.7	39.2	40.0	43.0	43.0
Industry & Commerce Innovative Opportunity, Space Tech Management and Integration	74.4		63.2	79.4	108.1	109.2	110.3
Technology Demonstration	**515.4**		**459.1**	**460.5**	**465.2**	**472.8**	**479.1**
Flight Opportunities and Small Spacecraft Technology	**67.1**		**72.7**	**74.0**	**74.5**	**76.0**	**77.5**
Technology Demonstration Missions (TDM)	**448.3**		**386.4**	**386.5**	**390.7**	**396.8**	**401.6**
On-Orbit Servicing and Manufacturing Demonstration-1 (OSAM-1)	227.0		11.0	-	-	-	-
Solar Electric Propulsion (SEP)	18.5		13.0	7.7	6.6	5.7	1.7
Cryogenic Fluid Management (CFM)	75.0		82.7	53.8	47.6	47.0	39.0
Fission Surface Power	16.0		113.8	194.9	226.6	243.4	249.3
Space Nuclear Propulsion (NTP and NEP)	91.3		110.0	70.5	54.5	45.5	42.5
MOXIE, LOFTID, DSOC, OSAM-2, LCRD, TDM Selected ACO/TP, TDM Mgt & Integration	20.5		55.9	59.6	55.4	55.2	69.1