

Appendix C: Potential Transition and Infusion Opportunities

Below is a listing of all the subtopics by focus area and a designation if there are potential transition and infusion opportunities that exist within each subtopic. Proposers should think of this as a guide while understanding that NASA is not placing any priority on subtopics or awards that fall under these specific opportunities. Proposers that submit a proposal under a subtopic that is aligned with these opportunities do not increase their chance for an award.

Subtopic #	Subtopic Title	Moon to Mars	CLPS	Flight Opps	ISS
FA1 In-Space Propulsion Technologies (Lead: STMD)					
Z10.01	Cryogenic Fluid Management	Yes			Yes
Z10.03	Space Nuclear Propulsion		Yes	Yes	
Z10.04	Materials, Processes, and Technologies for Advancing In-Space Electric Propulsion Thrusters		Yes	Yes	
FA2 Power Energy and Storage (Lead: STMD, Participating: SMD)					
S3.01	Power Generation and Conversion				
S3.02	Dynamic Power Conversion				
S3.03	Energy Storage for Extreme Environments				
Z1.05	Lunar and Planetary Surface Power Management and Distribution	Yes			
Z1.06	Radiation-Tolerant High-Voltage, High-Power Electronics	Yes			
Z1.07	Dynamic Energy Conversion for Space Nuclear Power and Propulsion				
FA3 Autonomous Systems for Space Exploration (Lead: HEOMD, Participating: SMD, STTR)					
H6.22	Deep Neural Net and Neuromorphic Processors for In-Space Autonomy and Cognition	Yes			Yes
H6.23	Spacecraft Autonomous Agent Cognitive Architectures for Human Exploration	Yes			Yes
S5.05	Fault Management Technologies				
T10.03	Coordination and Control of Swarms of Space Vehicles	Yes	Yes	Yes	Yes
T10.04	Autonomous Systems and Operations for the Lunar Orbital Platform-Gateway	Yes	Yes		Yes
T10.05	Integrated Data Uncertainty Management & Representation for Trustworthy and Trusted Autonomy in Space	Yes	Yes	Yes	Yes
FA4 Robotic Systems for Space Exploration (Lead: STMD, Participating: SMD, STTR)					
S4.02	Robotic Mobility, Manipulation and Sampling				
Z5.04	Technologies for Intravehicular Activity Robotics	Yes			Yes
T7.04	Surface Construction	Yes	Yes	Yes	
FA5 Communications and Navigation (Lead: HEOMD, Participating: SMD, STTR)					
H9.01	Long Range Optical Telecommunications	Yes			
H9.03	Flight Dynamics and Navigation Technologies			Yes	
H9.05	Transformational Communications Technology	Yes			
H9.07	Cognitive Communication	Yes			Yes

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S3.04	Guidance, Navigation, and Control				Yes
T5.04	Quantum Communications	Yes	Yes	Yes	Yes
FA6 Life Support and Habitation Systems (Lead: HEOMD, Participating: STTR)					
H3.02	Microbial Monitoring for Spacecraft Cabins	Yes			Yes
H3.05	Additive Manufacturing for Adsorbent Bed Fabrication	Yes			Yes
H3.07	Flame Retardant Textiles for IntraVehicular Activities (IVA)	Yes			Yes
H4.05	Advancements in Water and Air Bladder Assemblies and Technology	Yes			Yes
T6.06	Enabling Spacecraft Water Monitoring through Nanotechnology	Yes		Yes	Yes
T6.07	Space Exploration Plant Growth	Yes	Yes	Yes	Yes
FA7 Human Research and Health Maintenance (Lead: HEOMD)					
H12.01	Radioprotectors and Mitigators of Space Radiation-Induced Health Risks	Yes			Yes
H12.03	Portable Spatial Disorientation Simulator - Trainer	Yes			
FA8 In-Situ Resource Utilization (Lead: STMD, Participating: STTR)					
Z12.01	Extraction of Oxygen and Water from Lunar Regolith	Yes			
T14.01	Advanced Concepts for Lunar and Martian Propellant Production, Storage, Transfer, and Usage	Yes	Yes	Yes	Yes
FA9 Sensors, Detectors and Instruments (Lead: SMD, Participating: STTR)					
S1.01	Lidar Remote-Sensing Technologies				
S1.02	Technologies for Active Microwave Remote Sensing				
S1.03	Technologies for Passive Microwave Remote Sensing				
S1.04	Sensor and Detector Technologies for Visible, Infrared (IR), Far-IR, and Submillimeter				
S1.05	Detector Technologies for Ultraviolet (UV), X-Ray, Gamma-Ray Instruments				
S1.06	Particles and Fields Sensors and Instrument Enabling Technologies			Yes	
S1.07	In Situ Instruments/Technologies for Lunar and Planetary Science	Yes			
S1.08	Suborbital Instruments and Sensor Systems for Earth Science Measurements				
S1.09	Cryogenic Systems for Sensors and Detectors				
S1.10	Atomic quantum sensor and clocks				
S1.11	In Situ Instruments/Technologies and Plume Sampling Systems for Ocean Worlds Life Detection				
S1.12	Remote Sensing Instrument Technologies for Heliophysics			Yes	
T8.06	Quantum Sensing and Measurement	Yes	Yes	Yes	
T8.07	Photonic Integrated Circuits	Yes	Yes	Yes	Yes
FA10 Advanced Telescope Technologies (Lead: SMD)					
S2.01	Proximity Glare Suppression for Astronomical Direct Detection of Exoplanets				

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S2.02	Precision Deployable Optical Structures and Metrology				
S2.03	Advanced Optical Systems and Fabrication/Testing/Control Technologies for Extended-Ultraviolet/Optical and Infrared Telescope				
S2.04	X-Ray Mirror Systems Technology, Coating Technology for X-Ray-UV-OIR, and Free-Form Optics				
S2.05	Technology for the Precision Radial Velocity Measurement Technique				
FA11 Spacecraft and Platform Subsystems (Lead: SMD, Participating: STMD)					
S3.05	Terrestrial Balloons and Planetary Aerial Vehicles				
S3.08	Command, Data Handling, and Electronics				
S4.03	Spacecraft Technology for Sample Return Missions				
S4.04	Extreme Environments Technology				
S4.05	Contamination Control and Planetary Protection				
Z2.02	High-Performance Space Computing Technology				
FA12 Entry, Descent, and Landing Systems (Lead: STMD, Participating: HEOMD, STTR)					
H5.02	Hot Structure Technology for Aerospace Vehicles			Yes	
Z7.01	Entry, Descent, and Landing Flight Sensors and Instrumentation	Yes		Yes	
Z7.03	Entry and Descent System Technologies			Yes	
Z7.04	Landing Systems Technologies	Yes	Yes	Yes	
Z7.06	Entry, Descent, and Landing (EDL) Terrestrial Testing Technologies				
T9.02	Rapid Development of Advanced High-Speed Aerosciences simulation capability	Yes			
FA13 Information Technologies for Science Data (Lead: SMD)					
S5.01	Technologies for Large-Scale Numerical Simulation				
S5.03	Accelerating NASA Science and Engineering through the Application of Artificial Intelligence				
S5.04	Integrated Science Mission Modeling				
S5.06	Space Weather Research-to-Operations/Operations-to-Research (R2O/O2R) Technology Development				
FA14 On-orbit Servicing, Assembly, and Manufacturing (OSAM) (Lead: STMD, Participating: STTR)					
Z3.03	Development of Advanced Joining, Large-Scale Additive Manufacturing Processes, and Metal Recycling Technologies for On-Orbit Manufacturing				Yes
Z3.04	Autonomous Modular Assembly Technology for On-Orbit Servicing, Assembly, and Manufacturing (OSAM)			Yes	
Z3.05	Satellite Servicing Technologies			Yes	
T12.06	Extensible Modeling of Additive Manufacturing Processes	Yes			
FA15 Materials, Materials Research, Structures, and Assembly (Lead: STMD, Participating: HEOMD, STTR)					
H5.01	Lunar Surface Solar Array Structures				
Z4.04	Real-Time Defect Detection, Identification, and Correction in Wire-Feed and Fused-Filament Additive Manufacturing				

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Z4.05	Nondestructive Evaluation (NDE) Sensors, Modeling, and Analysis				
Z4.06	Manufacturability Assessment as a Design Constraint for Advanced Tailorable Composites				
T12.05	Use of Additive Manufacturing for Thermal Protection Systems	Yes		Yes	
T12.07	Design Tools for Advanced Tailorable Composites	Yes			
FA16 Ground & Launch Processing (Lead: HEOMD, Participating: STTR)					
H10.01	Advanced Propulsion Systems Ground Test Technology	Yes			
H10.02	Autonomous Operations Technologies for Ground and Launch Systems	Yes			
T13.01	Intelligent Sensor Systems	Yes	Yes	Yes	Yes
FA17 Thermal Management Systems (Lead: STMD, Participating: SMD)					
S3.06	Thermal Control Systems	Yes	Yes	Yes	
Z2.01	Spacecraft Thermal Management	Yes			
FA18 Air Vehicle Technology (Lead: ARMD, Participating: STTR)					
A1.01	Aerodynamic and Structural Efficiency - Integration of Flight Control with Aircraft Multidisciplinary Design Optimization				
A1.02	Quiet Performance - Airframe Noise Reduction				
A1.03	Propulsion Efficiency - Propulsion Materials and Structures				
A1.04	Electrified Aircraft Propulsion				
A1.05	Computational Tools and Methods				
A1.06	Vertical Lift Technology and Urban Air Mobility				
A1.07	Electric Power Generation Via Thermionic Conversion for Hypersonic Applications				
A1.08	Aeronautics Ground Test and Measurement Technologies				
A1.09	Vehicle Sensor Systems to Enable Situational Awareness				
T15.04	Full-Scale (2+ Passenger) Electric Vertical Takeoff and Landing (eVTOL) Scaling, Performance, Aerodynamics, and Acoustics Investigations			Yes	
FA19 Integrated Flight Systems (Lead: ARMD)					
A2.01	Flight Test and Measurement Technologies				
A2.02	Enabling Aircraft Autonomy				
A2.03	Advanced Air Mobility (AAM) Integration				
FA20 Airspace Operations and Safety (Lead: ARMD)					
A3.01	Advanced Air Traffic Management System Concepts				
A3.02	Increasing Autonomy in the National Airspace System (NAS)				
A3.03	Future Aviation Systems Safety				
A3.04	Nontraditional Airspace Operations				
FA21 Small Spacecraft Technologies (Lead: STMD, Participating, STTR)					
Z8.02	Communications and Navigation for Distributed Small Spacecraft Beyond Low Earth Orbit (LEO)	Yes	Yes	Yes	

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Z8.08	Technologies to Enable Cost and Schedule Reductions for Optical System for CubeSats		Yes	Yes	
Z8.09	Small Spacecraft Transfer Stage Development		Yes	Yes	
Z8.10	Wireless Communication for Avionics and Sensors for Space Applications	Yes	Yes	Yes	Yes
Z8.11	Artificial Intelligence (AI)/Machine Learning (ML) for Small Spacecraft Swarm Trajectory Control	Yes			
Z8.12	Modular and Batch-Produced Small Spacecraft			Yes	
T5.05	Solar and Electric Sail Embedded Technologies for Communications, Control, or Ancillary Functions				
FA22 Low Earth Orbit Platform Utilization and Microgravity Research (Lead: HEOMD)					
H8.01	Low Earth Orbit (LEO) Platform Utilization to Foster Commercial Development of Space				Yes
FA23 Digital Transformation (Lead: STTR, Participating: HEOMD)					
H6.04	Model-Based Systems Engineering for Distributed Development	Yes			Yes
T11.04	Digital Assistants for Science and Engineering	Yes		Yes	Yes
T11.05	Model-Based Enterprise				
FA24 Dust Mitigation (Lead: STMD)					
Z13.01	Active and Passive Dust Mitigation Surfaces	Yes	Yes		
Z13.02	Dust-Tolerant Mechanisms	Yes	Yes		
Z13.03	Lunar Dust Mitigation Technology for Spacesuits	Yes			