

Table 1 : NASA Research Focus Areas (title)

RFA	Title
RFA-156	Lunar and Martian Sustainability of Additively Manufactured Materials
RFA-155	Development and Thermal/Mechanical Properties of Carbon Nanotube-Polymer Composites
RFA-154	Soft matter with specific focus on granular materials, colloidal science, rheology and other non-Newtonian Fluids
RFA-153	Development of an algorithm to invert 3D capacitance data to estimate 3D dielectric profile
RFA-152	Compact, deployable dual polarized low frequency (40-200 MHz) Log Periodic Dipole Array (LPDA) antenna for remote sensing of magnetic field of distribution inside large expulsions of plasma from the Sun's corona.
RFA-151	Photogrammetric methods to measure dynamic motions of structures and validate dynamic models
RFA-150	An autonomous method of structural repair of spacecraft
RFA-149	Self healing metals in space environments
RFA-148	Investigation into technologies that allow for autonomous printing such as in-situ monitoring or self-cleaning technologies.
RFA-147	Investigation of the durability and wear resistance of ceramic parts produced by additive manufacturing.
RFA-146	Optimization of process parameters for ceramic feedstocks used in additive manufacturing in a micro or reduced gravity processing environment.
RFA-144	Investigation of microstructural properties of ceramic parts produced by additive manufacturing compatible with microgravity.
RFA-143	Research into technologies that can print multi-material parts in a singular platform.
RFA-142	Development of methods for in-orbit repair and maintenance of spacecraft using metal additive manufacturing.
RFA-141	Research on ways to improve the quality and consistency of metal AM part produced in microgravity.
RFA-140	Study solidification behavior in simulated microgravity environments.
RFA-139	Study the effect of processing temperatures for bound metal additive manufacturing with an emphasis on how temperature profiles may change in microgravity.
RFA-138	Research into the optimization of process parameters for bound metal deposition additive manufacturing with an emphasis on micro- or reduced gravitational effects.
RFA-137	Investigation of microstructural properties of metal parts produced by bound metal deposition additive manufacturing with an emphasis on micro- or reduced gravitational effects.
RFA-136	Development of new bound metal feedstocks for additive manufacturing using non-solvent based debinding.

RFA-135	Development of lunar, ISRU-based, "waterless" cementitious materials for construction
RFA-134	Lunar regolith simulants
RFA-133	Synthetic biology applications to construction of infrastructure elements
RFA-132	Creating instrumentation to verify structural properties/integrity in space
RFA-131	Reducing water content in concrete
RFA-130	Logistics studies for outfitting
RFA-129	Landing pad design
RFA-128	Outfitting
RFA-127	Concrete chemistry that will lend itself to applications on Earth, as well as space.
RFA-126	<i>Lunar surface navigation using AI-assisted feature identification</i>
RFA-125	Artificial Intelligence and Machine Learning Methods for Distributed Planning, Scheduling, and Execution Robust to Communication Delays
RFA-124	Quantum Characterizations of classical optical communications links
RFA-123	Fundamental physics requiring quantum sensing in space. Astrophysical, cosmological or fundamental physics concepts requiring quantum systems and sensors in space. Examples include gravitational wave observation, dark matter or dark energy searches, quantum foundations
RFA-122	Optical lattice clocks for space applications. Ultra-precise time keeping with low size, weight and power for deep space position, navigation and timing. Optical time transfer methods for dissemination of ultra precise clocks.
RFA-121	Quantum magnetometry for space systems: Spin- or defect-based magnetometers with wide bandgap semiconductors or laser cooled atom systems. Capabilities for low size, weight and power, radiation hardening and operation in extreme environments
RFA-120	Laser optical systems for cold atom sensors: Development of high power (>1 W), ultra narrow linewidth (<1 kHz) modular laser systems at 780nm or 852nm for integration with cold atom interferometers, cold atom inertial sensors and optical lattice clocks.
RFA-119	Quantum gravitational sensors: Robust cold atom sensors for space-based gravity gradiometry and gravimetry. Development of low size, weight and power systems utilizing high flux cold or ultra cold atom interferometers based on Rb, Cs or other alkali species for gravity or inertial sensing.
RFA-118	Develop autonomous systems for weld and Additive Manufacturing microscopy (e.g. polishing, etching, imaging)
RFA-117	In-space joining: enabling technology for the space economy
RFA-116	Integrated Computational Materials Engineering (ICME) & Multi-Physics Modeling Work-Flows for Optimization of and Detailed Computational Characterization of Existing Materials and for Novel Materials Discovery.
RFA-115	Technologies for autonomous collaborative planetary multi-robot systems

RFA-114	Quantum Computing as a Service
RFA-113	Novel QKD+Chaotic Communications
RFA-112	Quantum Characterizations of classical optical communications links
RFA-111	Low Cost Space Optical Communications
RFA-110	Orbital Angular Momentum for Space Communications
RFA-109	Deep Learning and Neural Networks for Optical Communications
RFA-108	Quantum Clock Synchronization
RFA-107	Quantum Optics
RFA-106	Trash Processing – Recycling and Resources Extraction from Space Logistical Waste
RFA-105	Development of reduced-volume acoustic liner concepts for subsonic aircraft and/or urban air mobility (UAM) applications
RFA-104	Phytoplankton Biodiversity of Inland Waters (South Africa – NASA BioSCape Project)
RFA-103	Low Earth Orbit Downmass Concepts: Development of small, unmanned re-entry vehicle concepts that provide small volume and downmass capabilities designed to deliver products created on the International Space Station to the Earth.
RFA-102	Building Bridges in Biosciences: Creating novel teams of researchers and technologists that collaborate to advance one or more of the following space life sciences topical areas: instrumentation, facilities, databases, artificial intelligences/machine learning, and mission concepts. Proposals must demonstrate benefit to both the astrobiology and space biology communities.
RFA-101	Inorganic Solid-electrolytes Processing and Scale-Up
RFA-100	Multifunctional Structural Materials for Extreme Space Environments
RFA-099	Improvements for Entry, Descent and Landing
RFA-098	Wireless Communication for Avionics and Sensors for Small Spacecraft Space Applications
RFA-097	Water Electrolysis: Includes proton exchange membrane and alkaline electrolyzers.
RFA-096	Utilization of Machine Learning Approaches for Efficient Estimation of Vector Magnetic Fields from SDO/HMI and SoHO/MDI
RFA-095	Transfer Function of Nondestructive Evaluation Response of Cracks and Notches
RFA-094	Tissue and Data sharing for space radiation risk and mitigation strategies
RFA-093	THz limb sounding of the thermosphere

RFA-092	Thermal Batteries: Includes new cell chemistries and spacecraft applications.
RFA-091	The dense, warm interstellar medium
RFA-090	Testing: Ground testing capabilities for small satellites in a realistic environment to perform; Small Satellite inspection flight hardware qualification testing; Small Satellite docking demonstration in a realistic environment
RFA-089	Technologies That Enable Large Swarms of Small Spacecraft
RFA-088	Submm-wave and IR polarimetry for cloud remote sensing
RFA-087	Studying phytoplankton ecology and community composition, both in situ and derived from ocean color remote sensing.
RFA-086	Stereo imaging from space
RFA-085	Spearheading big data analysis using satellite ocean color remote sensing products and field measurements, and create and validate bio-optical algorithms.
RFA-084	Spacecraft Battery Design, Test and Operation.
RFA-083	Space radiation sex-differences
RFA-082	Solid-state electrolytes including polymer/composite polymer electrolyte
RFA-081	Solar power from the cell to the array level, ground and in-space testing of photovoltaic systems, mission support of solar powered spacecraft
RFA-080	Societal ramifications of ethical decision making
RFA-079	Small Spacecraft Lunar Communications and Navigation Networks
RFA-078	Small Spacecraft High-Bandwidth Interoperable Space Layer and Networking for Cislunar and Deep Space
RFA-077	Seismometry to meteorology and other science measurement preparation
RFA-076	Satellite and Ground Communication systems
RFA-075	Safety of Electro-mechanical Powertrains for Electrified Vertical Takeoff and Landing (eVTOL) Vehicles
RFA-074	Research Fellow for Advanced Manufacturing of Sensors and Electronics
RFA-073	Remote Sensing of Land Use/Cover Changes, Vegetation (forestry, agriculture), Fires
RFA-072	Propulsion : Develop propulsion technology for small satellite proximity operations maneuvers; Provide propulsion performance to meet inspection time and coverage requirements; Ensure propulsion fault tolerance for reliability
RFA-071	Printed sensors (environmental, biosensors, structural health monitoring)

RFA-070	Portable, non-ionizing radiation based, high resolution disease detection imaging
RFA-069	Policy/Standards/Law Making Assessment
RFA-068	Pilot studies to demonstrate the utilization of full systems biology approaches in addressing human spaceflight risks
RFA-067	Pilot studies to adopt terrestrial precision health solutions for astronauts
RFA-066	Phytoplankton pigments and derivation of phytoplankton composition
RFA-065	Orchestrating multiple community driven efforts to standardize data collection, analysis, and management approaches; an example technical manual can be found here: https://repository.oceanbestpractices.org/handle/11329/1705
RFA-064	Novel thermal management of the propulsion components and/or of the propulsion system.
RFA-063	Nondestructive Evaluation of Additive Manufacturing
RFA-062	Multi-Physics Modeling: Thermal, fluid dynamics, electrochemical modeling for a wide range of reactor and device applications.
RFA-061	Molten Regolith Electrolysis: High temperature electrolysis of lunar and Martian soils to generate oxygen gas and metals.
RFA-060	Molecular clouds and star formation
RFA-059	Modeling, analysis, and support from field data for Venus related seismometer
RFA-058	Model Zoo” of pretrained biological models for transfer learning on space biology datasets
RFA-057	Mineralogy, geochemistry, and water-rock interactions
RFA-056	Materials development for additive manufacturing
RFA-055	Manufacturing and integration of low-cost, robust, reusable thermal protection systems with high temperature capability
RFA-054	Machine Learning-Based Detection of Flood Extent and Impacts
RFA-053	Lunar manufacturing of solar cells and sensors
RFA-052	Low temperature performance and thermal management
RFA-051	Li-ion and beyond Li-ion battery technologies such as metal-air
RFA-050	LEO manufacturing support (additive, advanced materials, thin layer processing)
RFA-049	Laser Communication

RFA-048	Inflammasome role in radiation-associated health impacts
RFA-047	In Situ Monitoring of Additive Manufacturing
RFA-046	Improved Understanding of Solar Microflares using Data Science
RFA-045	High Temperature Batteries: Includes primary and secondary cells up to 460oC.
RFA-044	High reliability and robustness for safety-critical propulsion systems including but not limited to a) arc fault protection; b) EMI/filtering; c) fault tolerant architectures; d) power management.
RFA-043	High power density power grids, power electronics, motors, and electromechanical powertrains
RFA-042	High capacity anode and high capacity/high voltage cathode
RFA-041	GNSS radio occultation (RO) for PBL
RFA-040	GNC: Mature guidance, navigation, and controls algorithms and hardware applied to small satellites performing inspection and rendezvous maneuvers; perform statistical studies and simulations to formulate damage probability metrics in support of a damage aware control system - Mature Verification &Validation of GNC algorithms for RPOC capabilities - Innovative reliable flight-ready low-cost sensors to enable rendezvous and proximity operations
RFA-039	Fuel Cells POC: Includes proton exchange membrane and alkaline fuel cells.
RFA-038	Formation of molecular clouds
RFA-037	Explore and document the parameters in play in the transition of ethical decision making from humans to autonomous systems
RFA-036	Evaluation space capsule and spacesuit activity in stable and fit lower or upper extremity amputees and compare their responses to non-amputee fit individuals
RFA-035	Electrochemical Sensors: Includes electrochemical impedance spectroscopy, dielectric spectroscopy.
RFA-034	Earth Science Remote Sensing
RFA-033	Document the Current State-of-the-Art/Practice of Ethical Decision Making by Humans in Operational Systems
RFA-032	Document legal ecosphere of ethical decision making in off-nominal scenarios
RFA-031	Development of Uranium based Fuels for Nuclear Thermal Rocket Propulsion
RFA-030	Development of materials for extreme environments
RFA-029	Development of high-temperature refractory alloys and coatings
RFA-028	Development of Coating Materials for Nuclear Thermal Rocket Applications
RFA-027	Development of Characterization Techniques to Determine Rate and Temperature Dependent Composite Material Properties for the LS-DYNA MAT213 Model

RFA-026	Development of advanced soft magnetic materials for high-power electronic systems
RFA-025	Development and elaboration of Functional aids and testing paradigms to measure activity for use by parastronauts during spaceflight
RFA-024	Design, Development, & Implementation of Highly Automated / Autonomous Systems to abide by ethical decision making policy, standards, guidelines, and laws
RFA-023	Current & projected autonomous performance capabilities and limitations
RFA-022	Compound screening techniques to assess efficacy in modulating responses to radiation exposure
RFA-021	CO2 Reduction: Electrochemical conversion of CO2 to various products including carbon monoxide and ethylene.
RFA-020	Chemical Heat Sources: High specific enthalpy systems including lithium-sulfur hexafluoride reactors for long-lived heat for planetary and lunar missions
RFA-019	Charting a successful course for field campaigns on behalf of NASA missions, including coordinating and supporting laboratory analysis of field samples (particle absorption, carbon) and data processing and collection and analysis of plankton images using in-flow imaging cytometry.
RFA-018	Beyond Lithium-Ion Cell Chemistries: Includes fluoride-ion, magnesium-ion, calcium-ion cell chemistries.
RFA-017	Balloon-based remote sensing of geophysical activity on Venus using infrasound
RFA-016	Bacteria, Archaea, and Fungi are capable of altering terrestrial materials as a way to acquire organic carbon and or trace nutrients.
RFA-015	Autonomy and GNC for multi-agent systems including formation flying, and spacecraft swarms
RFA-014	Autonomous System-Level Fault Diagnosis and Mitigation
RFA-013	Astrophysics Research and Analysis, and Technology Development
RFA-012	Artificial Intelligence (AI)/Machine Learning (ML) for Small Spacecraft Swarm Trajectory Control
RFA-011	Arctic phytoplankton ecology, ocean color remote sensing and optical properties, particularly the Chukchi Sea.
RFA-010	Application of Machine Learning to LNOx Estimation from Satellite Lightning Mappers
RFA-009	Application of advanced materials and manufacturing to achieve above.
RFA-008	Analytical and methodological pipelines that investigate the stoichiometry, elemental abundances, fluid chemistry and size distribution patterns of entrained particles in order to determine the probability for biological origin.
RFA-007	Analytical and methodological pipelines that investigate organic molecular patterns to identify the source and physicochemical history of naturally occurring suites of compounds and developing metrics that can differentiate between biological and abiotic reaction products.
RFA-006	Alternative materials for magnetized liner z-pinch implosions
RFA-005	Algorithm development for, and applications of, optical/thermal imagery for studying freshwater and coastal regions

RFA-004	Self-Healing/Resilient Multi-Agent Systems
RFA-003	Advanced Primary Battery Cells: Includes Lithium carbon monofluoride, lithium thionyl chloride, lithium sulfur dioxide, lithium iron sulfide, high temperature cells, ultra-low temperature cells.
RFA-002	Advanced Lithium-Ion Battery Cells: Wide operating temperature, low temperature, high temperature, high specific energy/high energy density cells, specialized electrolytes
RFA-001	Additive manufacturing and additive manufacturing of electronics