Link	Topic #	Title	Objective	Business Area	LM POC	Email Address
View Online	S3.02	Propulsion Systems for Robotic Science Missions	The Science Mission Directorate (SMD) needs spacecraft with more demanding propulsive performance and flexibility for more ambitious missions requiring high duty cycles, more challenging environmental conditions, and extended operation. Planetary spacecraft need the ability to rendezvous with, orbit, and conduct in-situ exploration of planets, moons, and other small bodies in the solar system (http://solarsystem.nasa.gov/2013decadal/). Future spacecraft and constellations of spacecraft will have high-precision propulsion requirements, usually in volume- and power-limited envelopes. Also recently precise propulsion systems have been incorporated into disturbance reduction systems to demonstrate that a solid body can float freely in space completely undisturbed in order to explore the gravitational universe. However, technology limits to propulsion system life still exist which can ultimately limit mission duration for more ambitious follow-on formation flying			
View Online	Z10.01	Cryogenic Fluid Management	This subtopic solicits technologies related to cryogenic propellant (such as hydrogen, oxygen, and methane) storage, and transfer to support NASA's exploration goals. This includes a wide range of applications, scales, and environments consistent with future NASA missions. Such missions include but are not limited to a Methane Upper Stage and In-Situ Resource Utilization in cooperation with Mars Landers in support			
View Online	Z10.02	Methane In-Space Propulsion	NASA is developing high thrust in-space chemical propulsion capabilities to enable human and robotic missions into the proving ground (Mars and beyond). Successful proposals are sought for focused investments on key technologies and design concepts that may transform the path for future exploration of Mars or beyond, while providing component and system-level cost and mass savings. In-space propulsion is defined as the development and demonstration of technologies for ascent, orbit transfer, pulsing attitude/reaction			
View Online	Z10.03	Nuclear Thermal Propulsion (NTP)	Solid core NTP has been identified as an advanced propulsion concept which could provide the fastest trip times with fewer SLS launches than other propulsion concepts for human missions to Mars over a variety of mission years. The current NASA Strategic Space Technology Investment Plan states NTP is a high priority technology needed for future human exploration of Mars. NTP had major technical work done between 1955-1973 as part of the Rover and Nuclear Engine for Rocket Vehicle Application (NERVA) programs. A few other NTP programs followed including the Space Nuclear Thermal Propulsion (SNTP) program in the early 1990's. The NTP concept is similar to a liquid chemical propulsion system, except instead of combustion in the thrust chamber, a monopropellant is heated with a fission reactor (heat exchanger) in the thrust chamber and exposes the engine components and surrounding structures to a			
View Online	S3.01	Power Generation and Conversion	Future NASA science missions will employ Earth orbiting spacecraft, planetary spacecraft, balloons, aircraft, surface assets, and marine craft as observation platforms. Proposals are solicited to develop advanced power-generation and conversion technologies to enable or enhance the capabilities of future science missions. Requirements for these missions are varied and include long life, high reliability, significantly lower mass and volume, higher mass specific power, and improved efficiency over the state of practice for components and systems. Other desired capabilities are high radiation tolerance and the ability to operate in extreme environments (high and low temperatures and over wide			

View Online	S3.03	Power Electronics and Management, and Energy Storage	NASAs science vision (https://smd-prod.s3.amazonaws.com/science-green/s3fspublic/ atoms/files/2014_Science_Plan_PDF_Update_508_TAGGED.pdf) is to use the vantage point of space to achieve with the science community and our partners a deep scientific understanding of the Sun and its effects on the solar system, our home planet, other planets and solar system bodies, the interplanetary environment, and the universe beyond. Scientific priorities for future planetary science missions are guided by the recommendations of the decadal surveys published by the National Academies. The goal of the decadal surveys is to articulate the priorities of the scientific community, and the surveys are therefore the starting point for NASAs strategic planning process in science (https://smd-prod.s3.amazonaws.com/science-green/s3fs-public/atoms/files/FY2014_NASA_StrategicPlan_508c.pdf). The most recent planetary science decadal survey, Vision and Voyages for Planetary Science in the Decade 2013 - 2022, was released in 2011. This report recommended a balanced suite of missions to enable a steady stream of new discoveries and capabilities to address challenges such as sample	LM Space Systems LM Missiles and Fire Control (MFC)	Jesus Isarraras John Fontana	jesus.isarraras@lmco.com john.c.fontana@lmco.com
View Online	Z1.01	High Power, High Voltage Electronics	NASA is seeking performance improvements to Power Management and Distribution (PMAD) systems through increases to the operating voltages of these electrical components. Specifically, NASA is developing Solar Electric Propulsion systems that use Power Processing Units (PPUs) to convert the 300V solar array output to the 700V-2000V input level of an electric thruster. Although many diodes and transistors exist in the commercial market place that would represent significant improvements over the state of the art space-qualified components, these parts have failed to pass critical tests related to space qualification most importantly in terms of their radiation tolerance. It is believed that the development and integration of high-voltage diodes and transistors that can be space-qualified will lead to increases in system-level performance as they will tend to increase efficiency and decrease mass at the system			
View Online	Z1.02	Surface Energy Storage	NASA is seeking innovative energy storage solutions for surface missions on the moon and Mars. The objective is to develop energy storage systems for landers, construction equipment, crew rovers, and science platforms. Energy requirements for mobile assets are expected to range up to 120 kW-hr with potential for clustering of smaller building blocks to meet the total need. Requirements for energy storage systems used in combination with surface solar arrays range from 500 kW-hr (Mars) to over 14 MW-hr (moon). Applicable technologies such as batteries and regenerative fuel cells should be lightweight, long-lived, and low cost. Of particular interest are technologies that are multi-use (e.g., moon and Mars) or cross-platform (e.g., lander use and rover use). Strong consideration should be given to environmental robustness for surface environments that include day/night thermal cycling, natural radiation, partial gravity, vacuum or very low ambient pressure, reduced solar insolation, dust, and wind. Creative ideas that utilize local materials to store energy would also be considered under this			
View Online	Z1.03	Surface Power Generation	NASA is seeking novel fission-based power generation technologies for surface missions on the moon and Mars. The objective is to develop power generation systems for landers, crewed habitats, and in-situ resource utilization plants. Power requirements are expected to range up to 40 kW with potential for clustering of smaller building blocks to meet the total need. Applicable thermal energy conversion should be lightweight, long-lived, and low cost. Of particular interest are technologies that are multi-use (e.g., moon and Mars). Strong consideration should be given to environmental robustness for surface environments that include day/night thermal cycling, natural radiation, partial gravity, vacuum or very low ambient pressure, dust, and wind. Recognizing that small businesses are not likely to develop the nuclear fuel core, proposals are solicited for the key non-			

View Online	H6.02	Resilient Autonomous Systems	Future human spaceflight missions will place crews at large distances and light-time delays from Earth, requiring novel capabilities for crews with limited ground support to manage spacecraft, habitats, and supporting equipment to prevent Loss of Mission (LOM) or Loss of Crew (LOC) over extended duration missions. In particular, these capabilities are needed to handle faults leading to loss of critical function or unexpected expenditure of consumables. Expanded flight control functionality will be on-board spacecraft to support autonomy with significant automation, autonomy, and decision support software. The increasingly complex interconnectivity of these elements introduces new vulnerabilities within space systems that are sometimes impossible to predict. In that context, one key property of the respective system is its resilience to unforeseen events.			
View Online	H6.03	Spacecraft Autonomous Agent Cognitive Architectures for Human Exploration	Future human spaceflight missions will place crews at long distances from Earth causing significant communication lag due to the light distance as well as occasional complete loss of communication with Earth. Novel artificial intelligence capabilities augmenting crews will be required for them to autonomously manage spacecraft operations and interact with Earth mission control under these conditions, including spacecraft and systems health, crew health, maintenance, consumable management, payload management, training, as well as activities such as food production	LM Missiles and Fire Control (MFC)	John Fontana	john.c.fontana@lmco.com
View Online	S4.02	Robotic Mobility, Manipulation and Sampling	Technologies for robotic mobility, manipulation, and sampling are needed to enable access to sites of interest and acquisition and handling of samples for in-situ analysis or return to Earth from planetary and solar system small bodies including Mars, Venus, comets, asteroids, and planetary moons. Application to Ocean Worlds is of increasing importance	LM Space Systems	Jesus Isarraras	jesus.isarraras@lmco.com
View Online	Z5.02	Robotic Systems - Mobility Subsystems	In the coming decades, robots will continue to change the way space is explored. Robots will be used in all mission phases: as independent explorers operating in environments too distant or hostile for humans, as precursor systems operating before crewed missions, as crew helpers working alongside and supporting humans, and as caretakers of assets left behind. As humans continue to work and live in space, they will increasingly rely on intelligent and versatile robots to perform mundane activities, freeing human and ground control teams to tend to more challenging tasks that			
View Online	H9.01	Long Range Optical Telecommunications	The Long Range Optical Communications subtopic seeks innovative technologies in free-space optical communications for increased data volume returns from space missions in multiple domains: >100 gigabit/s cis-lunar (Earth or lunar orbit to ground), >10 gigabit/s Earth-sun L1 and L2, >1 gigabit/s per AU-squared deep space, and >100 megabit/s planetary lander to orbiter. Proposals are sought in the following specific areas (TRL3 Phase I to	LM Space Systems	Jesus Isarraras	jesus.isarraras@lmco.com
View Online	H9.02	Intelligent Communication Systems	NASAs RF and optical systems require increased levels of adaptive, cognitive, and autonomous system technologies to improve mission communication for science and exploration. Goals of this capability are to improve communications efficiency, mitigate impairments (e.g., scintillation, interference), and reduce operations complexity and costs through intelligent and autonomous communications and data handling. Cognition and automation have the potential to improve system performance, increase data volume return, and reduce user spacecraft burden to improve science return from NASA missions. These goals are further described in the TA05 Communications, Navigation, and Orbital Debris Tracking and Characterization Systems Roadmap, Sections 5.2.1, 5.3.1, 5.3.2, 5.3.3, 5.3.4, 5.5.1,	LM Space Systems	Jesus Isarraras	jesus.isarraras@lmco.com
View Online	H9.03	Flight Dynamics and Navigation Technology	Future NASA missions will require precision landing, rendezvous, formation flying, cooperative robotics, proximity operations (e.g., servicing), and coordinated platform operations. This drives the need for increased precision in absolute and relative navigation solutions, and more advanced algorithms for both ground and onboard guidance, navigation, and control. This subtopic seeks advancements in flight dynamics and navigation technology for applications in Earth orbit, lunar, and deep space that enables future NASA missions. In particular, technology relating to navigation, autonomous onboard guidance, navigation and control,	LM Space Systems	Jesus Isarraras	jesus.isarraras@lmco.com

View Online	H9.04	Advanced RF Communications	This subtopic is focused on development of innovative Advanced RF Platform technologies, at the physical layer, supporting the needs of space missions in the areas of both communications and RF sensors.	LM Space Systems LM Missiles and Fire Control (MFC)	Jesus Isarraras John Fontana	jesus.isarraras@lmco.com john.c.fontana@lmco.com
View Online	H9.05	Transformational/Over-the-Horizon Communications Technology	NASA seeks revolutionary, transformational communications technologies that emphasize not only dramatic reduction in system size, mass, and power but also dramatic implementation and operational cost savings while improving overall communications architecture performance. The proposer is expected to identify new ideas, create novel solutions and execute feasibility demonstrations. Emphasis for this subtopic is on the far-term (10yrs.) insofar as mission insertion and commercialization but it is expected that the proposer proves fundamental feasibility via prototyping within the normal scope of the SBIR program. The over-the-horizon communications technology	LM Space Systems LM Missiles and Fire Control (MFC)	Jesus Isarraras John Fontana	jesus.isarraras@lmco.com john.c.fontana@lmco.com
View Online	S3.04	Guidance, Navigation and Control	NASA seeks innovative, groundbreaking, and high impact developments in spacecraft guidance, navigation, and control technologies in support of future science and exploration mission requirements. This subtopic covers mission enabling technologies that have significant performance improvements (SWaP-C) over the state of the art COTS in the areas of Spacecraft Attitude Determination and Control Systems, Absolute and Relative Navigation Systems, and Pointing Control Systems, and Radiation-Hardened GN&C Hardware.	LM Space Systems	Jesus Isarraras	jesus.isarraras@lmco.com
View Online	H3.01	Habitat Outfitting	Early definition of habitat outfitting for a vehicle is important because it will influence the overall vehicle architecture and layout. Vehicle outfitting provides the equipment necessary for the crew to perform mission tasks as well as provide them a comfortable, safe and livable habitable volume. Effective and efficient human-system interfaces and interactions are critical and should be considered as an integral part of this effort and demonstrated. Integrated outfitting is often a distributed hardware set that operates in unison or independently to perform a habitation function. Outfitting includes secondary structure (e.g., floors and walls), crew structures (e.g., crew quarters, radiation storm shelters) as well as the distribution of outfitting items (e.g., crew personal items) and utilities (e.g., avionics, ventilation, lighting) to sustain the crew during a mission. Habitat features and capabilities that allow autonomous monitoring or robotic interaction of items to enable habitat outfitting (e.g., high accuracy localization systems or mounting approaches) prior to crew arrival or after crew departure are also of interest. Concepts that can reuse launch support structure for outfitting are advantageous if it can be done without significant or with no crew interaction. Concepts should be capable of outfitting habitats with diameters of 3-8 meters and lengths of 4-10 meters. Habitat atmospheric pressure may vary from 0-1 atm for launch and 0.5-1 atm			
View Online	H3.02	Environmental Monitoring for Spacecraft Cabins	Environmental Monitoring is comprised of the following four monitoring disciplines: air, water, microbial and acoustics. ISS has employed a wide variety of analytical instruments to deal with critical items. These functional needs are required to address identified risks to crew health during Exploration-class missions. The current approach onboard ISS, if any, will serve as the logical starting point to meeting the functional needs. However, the following limitations were found common to all the current approaches on-board ISS for any missions beyond low-Earth orbit (LEO): reliance on return sample and ground analysis, require too much crew time, constraints on size, mass, and power, lack of portability, and insufficient calibration life. Hence a concerted effort is underway to address these gaps and mature those solutions to ground and flight technology demonstrations. Technologies that show improvements in miniaturization, reliability, life-time, self-calibration, and reduction of			
View Online	H3.03	Environmental Control and Life Support	NASA currently has CO2 removal and capture systems that are compact and effective, but future missions may require CO2 capture technology that control to lower levels, and operate with greater power efficiency. NASA is especially interested in systems with the following performance parameters:			

View Online	H3.04	Logistics Reduction	All human space missions, regardless of destination, require significant logistical mass and volume that is directly proportional to mission duration. As our exploration missions increase in distance and duration, logistics reduction becomes even more important since they may need to be pre-deployed 2-5 years before a crew arrives. Reducing the initial mass and volume of supplies, or reusing items that have been launched, will be very valuable. Logistics unique to a spacecraft system (i.e., life support and propulsion) are not addressed by this subtopic and are not			
View Online	H4.01	Damage Tolerant Lightweight Pressure Structures	Damage to and the resultant leakage of the suit structure is a criticality 1 failure that could result in loss of mission or life. NASA is striving to build a robust suit structure that can withstand the wear and tear related to exploration of a planetary surface. A highly mobile exploration spacesuit must have lightweight and robust hard upper torso. Hard upper torsos are used on the current Extravehicular Mobility Unit systems and desirable for the future because they are robust structures that require little maintenance, they provide simple and robust interfaces with the portable life support system, and they create a consistent and well sized structure			
View Online	H4.02	Small, Accurate Oxygen Compatible Gas Flow Meter for Suit Operations	The current state of the art for flow measurement on the current ISS Extravehicular Mobility Unit (EMU) space suit is a flapper valve tied to a microswitch. The current EMU flapper valve technology only supports microgravity EVAs (single flow rate requirement) with a sufficient versus non-sufficient flow measurement capability. With the multimission goals of the advanced space suit, variable flow rates are required. Therefore, the goals for the required flow meter include accurate measurement of 2-8 acfm 1% with a pressure drop requirement of less than 0.68 in-H20 in a pure oxygen (O2) environment. This flow meter needs to also fit within a volume/shape factor of approximately 2.5 in x 1.5in x 3in or less. An innovation is required since currently available flow meters do not meet these			
View Online	H4.03	Sensors to Measure Space Suit Interactions with the Human Body	Space suits can be tested unmanned for range of motion and joint torque in an attempt to quantify and compare space suit joint designs and overall suit architecture. However, this data is irrelevant if humans using the suits aren't effective. Characterizing human suited performance has continued to be a challenge, partly due to limitations in sensor technology. One concept is to use sensors placed at/on the human body, underneath the pressure garment to obtain knowledge of the human bodies movements. This data could then be compared against the suit motion. Various sensors, sensor technologies, and sensor implementations have been attempted over two decades of efforts, but each has had issues. Previous efforts have used Force Sensitive Resistors (FSR), TouchSense shear sensors, pressuresensing arrays (Tek scan etc.), piezo-electric sensors, among others but have not met all requirements. Most issues have centered around accuracy when placed on the pliant surface of the skin, and accuracy when placed over curved surfaces of the skin. Accuracy has been sufficient to delineate low, medium or high levels of force but not a reliable quantitative value. This, combined with aberrant readings when the sensor is bent has led to these sensors only providing a rough idea of the interaction between the suit and the skin: while in a controlled environment the sensors are accurate to within 10% or so, the accuracy falls significantly when measuring the skin and being bent or pressed in inconsistent ways; on the order of 50% accuracy or worse. The sensors also are prone to drift (falling out of calibration) quickly during use. Lastly, the sensors, while pliant, are still relatively thick and as such translates to			

View Online	H6.01	Integrated System Health Management for Sustainable Habitats	Habitation systems provide a safe place for astronauts to live and work in space and on planetary surfaces. They enable crews to live and work safely in deep space, and include integrated life support systems, radiation protection, fire safety, and systems to reduce logistics and the need for resupply missions. Innovative health management technologies are needed in order to increase the safety and mission-effectiveness for future space habitats on other planets, asteroids, or lunar surfaces. For example, off-nominal or failure conditions occurring in safety-critical life support systems may need to be addressed quickly by the habitat crew without extensive technical support from Earth due to communication delays. If the crew in the habitat must manage, plan and operate much of the mission themselves, operations support must be migrated from Earth to the habitat. Enabling monitoring, tracking, and management capabilities on-board the habitat and related EVA platforms for a small crew to use will require significant automation and decision support software.			
View Online	H11.01	Radiation Shielding Technologies for Human Protection	Advanced radiation shielding technologies are needed to protect humans from the hazards of space radiation during future NASA missions. All space radiation environments in which humans may travel in the foreseeable future are considered, including the Moon, Mars, asteroids, geosynchronous orbit (GEO), and low Earth orbit (LEO). All particulate radiations are considered, particularly galactic cosmic radiation (GCR), solar energetic particles (SEP), and			
View Online	H12.01	Radioprotectors and Mitigators of Space Radiation-induced Health Risks	Space radiation is a significant obstacle to sending humans on long duration missions beyond low earth orbit. NASA is concerned with the health risks to astronauts following exposures to galactic cosmic rays (GCR), the high energy particles found outside Earths atmosphere. Astronaut health risks from GCR are categorized into cancer, late and early central nervous systems (CNS) effects, and degenerative risks, which includes cardiovascular diseases and			
View Online	H12.02	Advanced Model-based Adaptive Interfaces and Augmented Reality	NASA is seeking innovative solutions for the design of adaptive interfaces for complex information systems that will be used on autonomous missions by crewmembers in various states of workload, stress, and fatigue. Adaptive user interfaces, also called intelligent user interfaces, can decrease workload in cases of high attentional loads by presenting the information needed in simpler forms or in different formats. For example, to decrease attentional load, the interface may be modified from text to icons, or the interaction may change from written procedures to voice commands. There is evidence that workload can be reduced if some of the visual information is presented in a different modality or format in high attentional demand situations. Adaptive user interfaces can also provide displays that offer improved and optimized navigation tailored for the current state of the user. Interfaces can be augmented with visual and auditory elements that, again, adapt based on the needs of the user. Thus, the adaptability of the interface is increased in a different dimension. The augmented reality (AR) technology holds the promise to improve crew performance to execute complex procedures in a deep-space human spaceflight missions where	LM Missiles and Fire Control (MFC)	John Fontana	john.c.fontana@lmco.com
View Online	H1.01	Mars Atmosphere Acquisition, Separation, and Conditioning for ISRU	Innovative technologies and approaches are sought related to ISRU processes associated with collecting, separating, pressurizing, and processing gases collected from the Mars atmosphere. State of the art (SOA) technologies for these ISRU processes either do not exist, are too small of scale, or are too complex, heavy, inefficient, or consume too much power. Proposals must consider and address operating life issues for Mars surface applications that can last for up to 480 days of continuous (day/night) operation. All proposals need to identify the State of the Art of applicable technologies and processes. Hardware to be delivered at the conclusion of Phase II will be required to operate under Mars surface pressure, atmosphere constituent, and temperature conditions. Therefore, thermal management during operation of the proposed technology will also need to be specified in the Phase I proposal. Requirements and specifications for Mars surface conditions and soil properties can be			

View Online	H1.02	Mars Soil Acquisition and Processing for In-Situ Water	Innovative technologies and approaches are sought related to ISRU processes associated with excavating and processing soils on Mars to remove, collect, and clean in-situ water for subsequent use in oxygen and fuel production or delivery to the habitat for life support and radiation shielding usage. Proposals must consider and address operating life issues for Mars surface applications that can last for up to 480 days of continuous (day/night) operation. All proposals need to identify the State of the Art of applicable technologies and processes. Hardware to be delivered at the conclusion of Phase II will be required to operate under Mars surface pressure, atmosphere constituent, and temperature conditions. Therefore, thermal management during operation of the proposed technology will also need to be specified in the Phase I proposal. Requirements and specifications for Mars surface conditions and soil properties can be found in the ISRU Topic Description. Phase I proposals for innovative technologies and processes must include the design and test of critical attributes or high risk areas associated with the proposed technology or process. Proposals will be evaluated on mass, power, complexity, and the ability to achieve hardware specifications below.			
View Online	H2.01	Lunar Resources	Whereas the Moon was once thought to be dry, more recent discoveries indicate that there are a variety of resources that exist on the Moon in an embedded or frozen state in the regolith. When acquired and exposed to higher temperatures and vacuum, these resources will change state into the vapor phase and are known as volatiles. Examples of this are polar water ice or hydrogen and helium 3 embedded in the regolith grains by the sun.			
View Online	S1.01	Lidar Remote Sensing Technologies	NASA recognizes the potential of lidar technology in meeting many of its science objectives by providing new capabilities or offering enhancements over current measurements of atmospheric and topographic parameters from ground, airborne, and space-based platforms. To meet NASAs requirements for remote sensing from space, advances are needed in state-of-the-art lidar technology with an emphasis on compactness, efficiency, reliability, lifetime, and high performance. Innovative lidar subsystem and component technologies that directly address the measurement of atmospheric constituents and surface topography of the Earth, Mars, the Moon, and other planetary bodies will be considered under this subtopic. Compact, high-efficiency lidar instruments for deployment on unconventional platforms, such as balloon, small sat, and CubeSat are also considered and encouraged.	LM Space Systems LM Missiles and Fire Control (MFC) LM Rotary and Mission Systems, C4 & Undersea Systems (RMS C4USS)	Jesus Isarraras John Fontana Michael Weingarten	jesus.isarraras@lmco.com john.c.fontana@lmco.com michael.weingarten@lmco.com
View Online	S1.02	Technologies for Active Microwave Remote Sensing	NASA employs active microwave sensors for a wide range of remote sensing applications (for example, see http://www.nap.edu/catalog/11820.html). These sensors include low frequency (less than 10 MHz) radar sounders to G-band (160 GHz) radars for measuring precipitation and clouds, for planetary landing, upper atmospheric monitoring, surface water monitoring, soil moisture and global snow coverage, topography measurement and other Earth and planetary science applications. We are seeking proposals for the development of innovative technologies to support future radar missions and applications. The areas of interest	LM Space Systems LM Missiles and Fire Control (MFC)	Jesus Isarraras John Fontana	jesus.isarraras@lmco.com john.c.fontana@lmco.com
View Online	S1.03	Technologies for Passive Microwave Remote Sensing	NASA employs passive microwave and millimeter-wave instruments for a wide range of remote sensing applications from measurements of the Earth's surface and atmosphere to cosmic background emission. Proposals are sought for the development of innovative technology to support future science and exploration missions MHz to THz sensors. Technology innovations should either enhance measurement capabilities (e.g., improve spatial, temporal, or spectral resolution, or improve calibration accuracy) or ease implementation in spaceborne missions (e.g., reduce size, weight, or power, improve reliability, or lower cost). While other concepts will be entertained, specific technology innovations of interest are listed below.	LM Missiles and Fire Control (MFC)	John Fontana	john.c.fontana@lmco.com
View Online	S1.04	Sensor and Detector Technology for Visible, IR, Far IR and Submillimeter	NASA is seeking new technologies or improvements to existing technologies to meet the detector needs of future missions, as described in the most recent decadal surveys:	LM Missiles and Fire Control (MFC)	John Fontana	john.c.fontana@lmco.com

View Online	S1.05	Detector Technologies for UV, X-Ray, Gamma-Ray and Cosmic Ray Instruments	This subtopic covers detector requirements for a broad range of wavelengths from UV through to gamma ray for applications in Astrophysics, Earth Science, Heliophysics, and Planetary Science. Requirements across the board are for greater numbers of readout pixels, lower power, faster readout rates, greater quantum efficiency, and enhanced energy resolution	LM Missiles and Fire Control (MFC)	John Fontana	john.c.fontana@lmco.com
View Online	S1.06	Particles and Field Sensors and Instrument Enabling Technologies	Advanced sensors for the detection of elementary particles (atoms, molecules and their ions) and electric and magnetic fields in space and associated instrument technologies are often critical for enabling transformational science from the study of the sun's outer corona, to the solar wind, to the trapped radiation in Earth's and other planetary magnetic fields, and to the atmospheric composition of the planets and their moons. Improvements in particles and fields sensors and associated instrument technologies enable further scientific advancement for upcoming NASA missions such as CubeSats, Explorers, STP, and planetary exploration missions. Technology developments that result in a reduction in size, mass, power, and cost will enable these missions to proceed. Of interest are advanced magnetometers, electric field booms, ion/atom/molecule detectors, and associated support electronics and materials. Specific areas of interest	LM Space Systems LM Missiles and Fire Control (MFC)	Jesus Isarraras John Fontana	jesus.isarraras@lmco.com john.c.fontana@lmco.com
View Online	S1.07	In-Situ Instruments/Technologies for Planetary Science	This subtopic solicits development of advanced instrument technologies and components suitable for deployment on in-situ planetary and lunar missions. These technologies must be capable of withstanding operation in space and planetary environments, including the expected pressures, radiation levels, launch and impact stresses, and range of survival and operational temperatures. Technologies that reduce mass, power, volume, and data rates for instruments and instrument components without loss of scientific capability are of particular importance. In addition, technologies that can increase instrument resolution and sensitivity or achieve new & innovative scientific measurements are solicited. For example missions, see http://science.hq.nasa.gov/missions. For details of the specific requirements see the National Research Councils, Vision and Voyages for Planetary Science in the Decade 2013-2022 (http://solarsystem.nasa.gov/2013decadal/). Technologies that support NASAs New Frontiers and Discovery			
View Online	S1.08	Surface & Sub-surface Measurement Systems	Surface & Sub-surface Measurement Systems are sought with relevance to future space missions such as Active Sensing of CO2 Emissions over Nights, Days, and Seasons (ASCENDS), Orbiting Carbon Observatory 2 (OCO-2), Global Precipitation Measurement (GPM), Geostationary Coastal and Air Pollution Events (GEO-CAPE), Hyperspectral InfraRed Imager (HyspIRI), Aerosol, Cloud, and Ecosystems (ACE, including Pre-ACE/PACE). Early adoption for alternative uses by NASA, other agencies, or industry is desirable and recognized as a viable path towards full maturity. Sensor system innovations with significant near-term commercial potential that may be suitable for			
View Online	S1.09	Cryogenic Systems for Sensors and Detectors	Cryogenic cooling systems often serve as enabling technologies for detectors and sensors flown on scientific instruments as well as advanced telescopes and observatories. As such, technological improvements to cryogenic systems further advance the mission goals of NASA through enabling performance (and ultimately science gathering) capabilities of flight detectors and sensors. There are four potential investment areas that NASA is seeking to expand state of the art capabilities for possible use on future programs such as WFirst (http://wfirst.gsfc.nasa.gov/), the Europa Jupiter System Science missions (http://www.nasa.gov/multimedia/podcasting/jpl-europa20090218.html), and flagship missions under consideration for the 2020 Astrophysics			

View Online	S1.10	Atomic Interferometry	Recent developments of laser control and manipulation of atoms have led to new types of precision inertial force and gravity sensors based on atom interferometry. Atom interferometers exploit the quantum mechanical wave nature of atomic particles and quantum gases for sensitive interferometric measurements. Ground-based laboratory experiments and instruments have already demonstrated beyond the state of the art performances of accelerometer, gyroscope, and gravity measurements. The microgravity environment in space provides opportunities for further drastic improvements in sensitivity and precision. Such inertial sensors will have great potential to provide new capabilities for NASA Earth and planetary gravity measurements, for spacecraft inertial navigation and guidance, and for gravitational wave detection and test of properties of gravity in space.			
View Online	S1.11	In-Situ Instruments/Technologies for Ocean Worlds Life Detection	This subtopic solicits development of in-situ instrument technologies and components to advance the maturity of science instruments focused on the detection of evidence of life, especially extant of life, in the Ocean Worlds (e.g., Europa, Enceladus, Titan, Ganymede, Callisto, Ceres, etc.). These technologies must be capable of withstanding operation in space and planetary environments, including the expected pressures, radiation levels, launch and impact stresses, and range of survival and operational temperatures. Technologies that reduce mass, power, volume, and data rates for instruments and instrument components without loss of scientific capability are of particular importance. In addition, technologies that can increase instrument resolution and sensitivity or achieve new & innovative scientific measurements are solicited. For synergistic NASA technology solicitation, see ROSES 2016/C.20 Concepts for Ocean			
View Online	S1.12	Sample Processing For Life Detection Investigations for Ocean Worlds	This solicitation is for development of innovative sample processing technologies (methodologies and hardware) for the purposes of improving the resolution and sensitivity of life detection measurements and supporting habitability assessment of environmental samples from Ocean Worlds (e.g., Europa, Enceladus, Titan, etc.). Samples are expected to contain water, minerals, salts, etc. that may complicate measurements or interfere with interpretations. Thus, samples are expected to require separation of components as a preparatory step to analysis. Analytes of interest (e.g., organic molecules including biomolecules, cells, and inorganic solutes and particulates) in samples may also be too dilute and could escape detection unless concentration technologies are applied as a preparatory step. These technologies must be capable of operation under space and planetary conditions, including the extreme pressures, temperatures, radiation levels, stress from launch and impact. Technologies should be of low mass, power, volume; capable of radiation-hardening and sterilization; and require low data rates. Technologies that support minimal biological and analytical contamination of the full technological component and sample stream in order to meet planetary protection requirements and maintain sample integrity for mission-science investigations as well as those			
View Online	S4.06	Sample Collection for Life Detection in Outer Solar System Ocean World Plumes	This subtopic solicits development of in-situ instrument technologies and components to advance the maturity of instruments focused on the collection of samples for life detection from plumes in the Ocean Worlds (e.g., Europa, Enceladus, Titan, Ganymede, Callisto, Ceres, etc.). These technologies must be capable of withstanding operation in space and planetary environments, including the expected pressures, radiation levels, launch and impact stresses, and range of survival and operational temperatures. Technologies that allow collection during high speed (>1 km/sec) velocity passes through a plume are of interest as are technologies that can maximize total sample mass collected while passing through tenuous plumes. Technologies that reduce mass, power, volume, and data rates without loss of			

View Online	S2.01	Proximity Glare Suppression for Astronomical Coronagraphy	This subtopic addresses the unique problem of imaging and spectroscopic characterization of faint astrophysical objects that are located within the obscuring glare of much brighter stellar sources. Examples include planetary systems beyond our own, the detailed inner structure of galaxies with very bright nuclei, binary star formation, and stellar evolution. Contrast ratios of one million to ten billion over an angular spatial scale of 0.05-1.5 arcsec are typical of these objects. Achieving a very low background requires control of both scattered and diffracted light. The failure to control either amplitude or phase fluctuations in the optical train severely reduces the effectiveness of starlight			
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View Online	S2.02	Precision Deployable Optical Structures and Metrology	Planned future NASA Missions in astrophysics, such as the Wide-Field Infrared Survey Telescope (WFIRST) and the New Worlds Technology Development Program (coronagraph, external occulter and interferometer technologies) will push the state of the art in current optomechanical technologies. Mission concepts for New Worlds science would require 10 - 30 m class, cost-effective telescope observatories that are diffraction limited at wavelengths from the visible to the far IR, and operate at temperatures from 4 - 300 K. In addition, ground based telescopes such as the Cerro Chajnantor Atacama Telescope (CCAT) requires similar	LM Space Systems	Jesus Isarraras	jesus.isarraras@lmco.com
View Online	S2.03	Advanced Optical Systems and Fabrication/Testing/Control Technologies for EUV/Optical and IR Telescope	This subtopic matures technologies needed to affordably manufacture, test or operate complete mirror systems or telescope assemblies. Solutions are solicited in the following areas: h Components and Systems for potential EUV, UV/O or Far-IR mission telescopes. h Technology to fabricate, test and control potential UUV, UV/O or Far-IR telescopes.	LM Space Systems	Jesus Isarraras	jesus.isarraras@lmco.com
View Online	S2.04	X-Ray Mirror Systems Technology, Coating Technology for X-Ray-UV-OIR, and Free-Form Optics	This subtopic solicits proposals in the following areas: h Components, Systems, and Technologies of potential X-Ray missions. h Coating technologies for X-Ray, EUV (extreme ultraviolet), LUV (Lyman ultraviolet), VUV (vacuum ultraviolet), Visible, and IR (infrared) telescopes. h Free-form Optics surfaces design, fabrication, and metrology.			
View Online	S3.05	Terrestrial and Planetary Balloons	NASAs Scientific Balloons provide practical and cost effective platforms for conducting discovery science, development and testing for future space instruments, as well as training opportunities for future scientists and engineers. Balloons can reach altitudes above 36 kilometers, with suspended masses up to 3600 kilograms, and can stay afloat for several weeks. Currently, the Balloon Program is on the verge of introducing an advanced balloon system that will enable 100 day missions at mid-latitudes and thus resemble the performance of a small spacecraft at a fraction of the cost. In support of this development, NASA is seeking innovative technologies in power storage and	LM Rotary and Mission Systems, Cyber, Ships and Advanced Technologies (RMS CSAT)	Gretchen Head	gretchen.head@lmco.com
View Online	S3.07	Slow and Fast Light	Steep dispersions in engineered media of a wide variety have opened up a new direction of research in optics. A positive dispersion can be used to slow the propagation of optical pulses to extremely small velocities. Similarly, a negative dispersion can lead to conditions where pulses propagate superluminally. These effects have now moved beyond the stage of intellectual curiosity, and have ushered in studies of a set of exciting applications of interest to NASA, ranging from ultraprecise superluminal gyroscopes to spectral interferometers having enhanced resolving	LM Aeronautics (Aero) LM Missiles and Fire Control (MFC)	Craig Owens John Fontana	craig.l.owens@lmco.com john.c.fontana@lmco.com
View Online	S3.08	Command, Data Handling, and Electronics	NASA's space based observatories, fly-by spacecraft, orbiters, landers, and robotic and sample return missions, require robust command and control capabilities. Advances in technologies relevant to command and data handling and instrument electronics are sought to support NASA's goals and several missions and projects under development	LM Space Systems LM Space Systems	Brian Zimbelman Jesus Isarraras	brian.zimbelman@lmco.com jesus.isarraras@lmco.com

View Online	S4.03	Spacecraft Technology for Sample Return Missions	NASA plans to perform sample return missions from a variety of scientifically important targets including Mars, small bodies such as asteroids and comets, and outer planet moons. These types of targets present a variety of spacecraft technology challenges	LM Space Systems	Jesus Isarraras	jesus.isarraras@lmco.com
View Online	S4.04	Extreme Environments Technology	NASA is interested in expanding its ability to explore the deep atmosphere and surface of giant planets, asteroids, and comets through the use of long-lived (days or weeks) balloons and landers. Survivability in extreme high-temperatures and high-pressures is also required for deep atmospheric probes to planets. Proposals are sought for technologies that are suitable for remote sensing applications at cryogenic temperatures, and in-situ atmospheric and surface explorations in the high-temperature high-pressure environment at the Venusians surface (485C, 93 atmospheres), or in low-temperature environments such as Titan (-180C), Europa (-220C), Ganymede (-200C), Mars, the Moon, asteroids, comets and other small bodies. Also Europa-Jupiter missions may have a mission life of 10 years and the radiation environment is estimated at 2.9 Mega-rad total ionizing dose (TID) behind 0.1 inch thick aluminum. Proposals are sought for technologies that enable NASA's long duration missions to extreme wide-temperature and cosmic radiation environments. High reliability, ease of maintenance, low volume, low mass, and low out-gassing characteristics are highly desirable. Special interest lies in development of following technologies that are suitable for the environments discussed above:			
View Online	S4.05	Contamination Control and Planetary Protection	A need to develop technologies to implement Contamination Control and Planetary Protection requirements has emerged in recent years with increased interest in investigating bodies with the potential for life detection such as Europa, Enceladus, Mars, etc. and the potential for sample return from such bodies. Planetary Protection is concerned with both forward and backward contamination. Forward contamination is the transfer of viable organisms from Earth to another body. Backward contamination is the transfer of material posing a biological threat back to Earth's biosphere. NASA is seeking innovative technologies or applications of technologies to facilitate meeting portions of forward and backward contamination Planetary Protection requirements as well as analytical technologies that can ensure hardware and instrumentation can meet organic contamination requirements in an effort to preserve sample			
View Online	Z6.01	High Performance Space Computing Technology	The NASA state-of-the-art in space computing is currently lagging commercial capabilities in both the hardware and software capabilities. Presently, NASA is investing in the development of a radiation-hardened multi-core General Purpose Processor (GPP) that is scalable for a variety of space computing application	LM Space Systems	Jesus Isarraras	jesus.isarraras@lmco.com
View Online	H5.02	Hot Structure Entry Control Surface Technology	The focus of this subtopic is the development of hot structure technology for entry vehicle control surfaces. A hot structure is a type of multifunctional structure that can reduce or eliminate the need for a separate thermal protection system (TPS) to protect the structure. The potential advantages of using a hot structure in place of a cool structure with a separate TPS are: reduced mass, increased mission capability such as reusability, improved aerodynamics, improved structural efficiency, and increased ability to inspect the structure. Hot structures is an enabling technology for reusability between missions or mission phases, such as aerocapture followed by entry, and have been used in many prior NASA programs: Space Shuttle (nosecap and leading edges), HyperX (nose and all-moving control surfaces), X-37 (flaperon and ruddervator control surfaces), and many			
View Online	S4.01	Planetary Entry, Descent and Landing and Small Body Proximity Operation Technology	NASA seeks innovative sensor technologies to enhance success for entry, descent and landing (EDL) operations on missions to other planetary bodies, including Earth's Moon, Mars, Venus, Titan, Europa, and proximity operations (including sampling and landing) on small bodies such as asteroids and comets			

View Online	Z7.01	Supersonic Parachute Inflation Materials Testing, And Instrumentation	Mars landed missions have traditionally relied on large (nominal diameter between 11.5 and 21.5 m) disk-gap-band (DGB) parachutes that must be inflated between Mach 1.2 and 2.2 at dynamic pressures between 300 and 850 Pa to ensure that the terminal landing phase occurs before hitting the ground. For robotic payloads larger than the Curiosity rover, larger parachutes will be required. These parachutes need to be tested under the low-density supersonic conditions that match Mars conditions. However understanding the shape history, dynamics, and induced stresses in the parachute structure and broadcloth during the inflation event is needed to ensure that minimum strength margin requirements are met. Further understanding the strength capability of materials under bi-axial and shear stress is essential. The measured material capabilities and stress conditions during inflation will be matched with computer models that will eventually be used as predictive tools in the parachute design process. This SBIR asks for help inventing and utilizing techniques for measuring parachute materials strength capabilities under flight-like loading conditions, and measuring, or inferring, parachute material stress and shape histories found during the inflation process during supersonic parachute inflation testing planned for the			
View Online	Z7.02	Deployable 3D Woven Thermal Protection Materials	Large scale mechanically deployed decelerator skirts are expected to experience 50-100 W/cm2 in various planetary oxidizing environments and are currently designed using flat panels of 3-D woven carbon fibers with sacrificial ablating outer layers over structural layers. The flat panels currently require cutting and joining at each structural rib	LM Aeronautics (Aero)	Craig Owens	craig.l.owens@lmco.com
View Online	Z7.03	Deployable Aerodynamic Decelerator Technology	Background: NASA is developing deployable aerodynamic decelerators to enhance, and enable, robotic and scientific missions to destinations with atmospheres such as Mars, Venus, and Titan, as well as returning payloads to Earth from Low Earth Orbit (LEO). The benefit to deployable decelerators is that relatively large atmospheric entry vehicles can be designed to fit within a comparatively small vehicle launch fairing.			
View Online	S5.01	Technologies for Large-Scale Numerical Simulation	NASA scientists and engineers are increasingly turning to large-scale numerical simulation on supercomputers to advance understanding of complex Earth and astrophysical systems, and to conduct high-fidelity aerospace engineering analyses. The goal of this subtopic is to increase the mission impact of NASA's investments in supercomputing systems and associated operations and services.	LM Missiles and Fire Control (MFC)	John Fontana	john.c.fontana@lmco.com
View Online	S5.02	Earth Science Applied Research and Decision Support	The NASA Earth (http://science.nasa.gov/earth-science/) and Applied Science (http://appliedsciences.nasa.gov/) programs seeks innovative and unique approaches to increase the utilization and extend the benefit of Earth Science research data to better meet societal needs. The main focus of this subtopic is improving the pipeline from NASA Earth Science data and products to a range of end user communities to support decision making. To that end, one area of interest is new or improved decision support tools for a variety of applications areas (http://appliedsciences.nasa.gov/sites/default/files/ar2014/index.html#/applications-areas), including but not limited to, disaster response, agricultural and food security, water resource management, land surface modeling, air quality			
View Online	S5.03	Enabling NASA Science through Large-Scale Data Processing and Analysis	The size of NASA's observational data sets is growing dramatically as new mission data become available. In addition, NASA scientists continue to generate new models that regularly produce data sets of hundreds of terabytes or more. It is growing increasingly difficult for NASA to effectively analyze such large data sets for use within their science projects.	LM Space Systems LM Missiles and Fire Control (MFC)	Jesus Isarraras John Fontana	jesus.isarraras@lmco.com john.c.fontana@lmco.com

View Online	S5.04	Integrated Science Mission Modeling	NASA seeks innovative systems modeling methods and tools to: h Define, design, develop and execute future science missions, by developing and utilizing advanced methods and tools that empower more comprehensive, broader, and deeper system and subsystem modeling, while enabling these models to be developed earlier in the lifecycle. The capabilities should also allow for easier integration of disparate model types and be compatible with current agile design processes. h Enable disciplined system analysis for the design of future missions, including modeling of decision support for those missions and integrated models of technical and programmatic aspects of future missions. Such models might also be made useful to evaluate technology alternatives and impacts, science valuation	LM Space Systems	Jesus Isarraras	jesus.isarraras@lmco.com
View Online	In-Space Manufact	In-Space Manufacturing of Electronics and Avionics	The purpose of this subtopic is to encourage highly collaborative research and development in the area of In-Space Printable Electronics capabilities geared towards laying the foundation and infrastructure for the next generation of in-space advanced electronics manufacturing technologies			
View Online	H7.02	In-Space Manufacturing of Precision Parts	Currently, both 3D Printers onboard the International Space Station (ISS) use Fused Deposition Modeling (FDM), an additive manufacturing extrusion based process that builds up a plastic part layer by layer. Since this process is not dependent on buoyancy driven convection to achieve material consolidation, it is highly functional in the microgravity environment and no microgravity effects on material outcomes have been observed to date. To expand material capabilities and impart an ability to produce high-strength, precision components on-orbit, candidate metal manufacturing technologies are currently being investigated for			
View Online	Z3.01	In-Situ Sensing of Additive Manufacturing Processes for Safety-Critical Aerospace Applications	NASA programs are embracing Additive Manufacturing (AM) technologies for their potential to increase the affordability of propulsion parts and components by offering significant schedule and cost savings over traditional manufacturing methods. Many NASA programs baseline AM components in their design, however qualification efforts are complicated by the absence of industry-accepted standards and process controls. The near-term methodology for part quality assurance is to use pre-process and post-process measurements to show that a part design and as-built hardware meet the established requirements to safely and reliably complete the intended mission. This method relies heavily on the ability to non-destructively evaluate parts to identify process escapes resulting in flaws in the AM parts. For parts of complex geometry, which is often the motivation toward AM, post-build inspections can be limited. The long-term goal of part qualification is to "qualify as you go." This concept uses pre-process, in-process, and post-process measurements to demonstrate that a part will perform to requirements. Successful technology demonstration has the potential to reduce scrap rates, and the cost and quantity of post-build NDE required for part	LM Aeronautics (Aero) LM Space Systems LM Missiles and Fire Control (MFC)	Craig Owens Jesus Isarraras John Fontana	craig.l.owens@lmco.com jesus.isarraras@lmco.com john.c.fontana@lmco.com
View Online	Z3.02	Advanced Metallic Materials and Processes Innovation	This subtopic addresses specific NASA needs in the broad area of metals and metals processes with the focus for this solicitation on solid state welding, additive manufacturing, and processing of specialty materials including bulk metallic glasses and boron nitride nanotube (BNNT) reinforced metal matrix composites (MMCs). Topic areas for solid state welding revolve around joining high melting point metallic materials including combinations of these higher melting point metalspreferably using solid state welding processes such as friction stir, thermal stir, and ultrasonic stir welding. Higher melting point materials include the nickel based superalloys such as Inconel 718, Inconel 625, titanium alloys such as Ti-6Al-4V, GRCop, and Mondaloy. The technology needs for solid state welding should be focused on process improvement, structural efficiency, quality, and reliability for higher temperature	LM Aeronautics (Aero)	Craig Owens	craig.l.owens@lmco.com
View Online	H5.01	Mars Surface Solar Array Structures	Initial manned missions to the Mars surface may use large photovoltaic (PV) solar arrays to generate power for habitats, ISRU, science investigations, and battery charging. Nominal overall size of the solar array "farm" is 2500 m2. Because of the critical nature of electrical power, this equipment may be prepositioned and validated prior to human landings. Modular solar array designs could be based on individual deployable structures with 50-150 m2 of area each. Another approach could be a single monolithic structure. Regardless of the configuration, autonomous	LM Space Systems LM Space Systems	Brian Zimbelman Jesus Isarraras	brian.zimbelman@lmco.com jesus.isarraras@lmco.com

View Online	Z4.01	In-Space Structural Assembly and Construction	Spacecraft that use modularity can be adaptable to changing needs particularly when open architectures with common interfaces are employed in the design. The ability to join spacecraft components autonomously in-space allows for the assembly of vehicles (perhaps aggregated from multiple launches) and for re-use of vehicle subsystems. Modular "plug and play" interfaces permit rapid assembly, upgrade and reconfiguration of spacecraft subsystems and instruments. The joining technology used for module interfaces should be reversible for maximum flexibility and utilize simple approaches (electro-mechanical or other) amenable to robotic assembly and disassembly. In addition, the joining technology must provide for mechanical, electrical and			
View Online	Z11.01	NDE Sensors	Technologies sought under this SBIR program can be defined as advanced sensors, sensor systems, sensor techniques or software that enhance or expand NASAs current senor capability. It desirable but not necessary to target structural components of space flight hardware. Examples of space flight hardware will include light weight structural materials including composites and thin metals. Technologies sought include modular, smart, advanced Nondestructive Evaluation (NDE) sensor systems and associated capture and analysis software. It is advantageous for techniques to include the development on quantum, meta- and nano sensor technologies for deployment. Technologies enabling the ability to perform inspections on large complex structures will be encouraged. Technologies should provide reliable assessments of the location and extent of damage. Methods are desired to perform inspections in areas with difficult access in pressurized habitable compartments and external environments for flight hardware. Many applications require the ability to see through assembled conductive and/or thermal insulating materials without contacting the surface. Techniques that can dynamically and accurately determine position and orientation of the NDE sensor are needed to automatically register NDE results to precise locations on the structure. Advanced processing and displays are needed to reduce the complexity of operations for astronaut crews who need to make important assessments quickly. NDE inspection sensors are needed for potential use on free-flying inspection platforms. Integration of wireless systems with NDE may be of significant utility. It is strongly encouraged to provide explanation of	LM Aeronautics (Aero)	Craig Owens	craig.l.owens@lmco.com
View Online	Z11.02	NDE Simulation and Analysis	Technologies sought under this subtopic include near real-time large scale nondestructive evaluation (NDE) and structural health monitoring (SHM) simulations and automated data reduction/analysis methods for large data sets. Simulations techniques will seek to expand NASAs use of physics based models to predict inspection coverage for complex aerospace components and structures. Analysis techniques should include optimized automated reduction of NDE/SHM data for enhanced interpretation appropriate for detection/characterization of critical flaws in space flight structures and components. Space flight structures will include light weight structural materials such as composites and thin metals. Future purposes will include application to long duration space vehicles, as well as validation of SHM systems. It is also considered highly desirable to develop tools for automating detection of material Foreign Object Debris (FOD) and/or defects and evaluation of bondline and in-depth integrity for light-weight rigid and/or flexible ablative materials are sought. Typical internal void volume detection requirements for ablative materials are on the order of less than 6mm and bondline defect			
View Online	H10.01	Advanced Propulsion Systems Ground Test Technology	Rocket propulsion development is enabled by rigorous ground testing to mitigate the propulsion system risks that are inherent in spaceflight. This is true for virtually all propulsive devices of a space vehicle including liquid and solid rocket propulsion, chemical and non-chemical propulsion, boost stage and in-space propulsion and so forth. It involves a combination of component-level and engine-level testing to demonstrate the propulsion devices were designed to meet the specified requirements for a specified operational envelope and over robust margins and shown			

View Online	H10.02	Improved Operations via Interface Design	This subtopic seeks to simplify prelaunch and surface operations through improved interface design concepts. Development and adoption of improved, standardized interfaces holds the potential of reducing the cost and complexity of future space systems and their related design and implementation, which can increase the funding available for additional flight hardware			
View Online	H10.03	Cryogenic Purge Gas Recovery and Reclamation	Helium is becoming a major issue for NASA and the country. Helium is used as a purge gas to reduce the concentration of hydrogen below the flammable threshold at test and launch complexes. Most of the Nation's helium comes from the National Helium Reserve operated by the Bureau of Land Management (BLM). The statutory authority for BLM to operate is expiring and responsibility is being transferred to the commercial sector. Helium is a non-renewable gas that is in limited supply. There are already helium supply constrictions and prices are going up. Conservation and/or reuse of this non-renewable resource would substantially reduce the cost of operating NASA's test and launch			
View Online	S3.06	Thermal Control Systems	Future Spacecraft and instruments for NASA's Science Mission Directorate will require increasingly sophisticated thermal control technology. Innovative proposals for the cross-cutting thermal control discipline are sought in the following areas:	LM Space Systems	Jesus Isarraras	jesus.isarraras@lmco.com
View Online	Z2.01	Thermal Management	Exploration vehicles require variable heat rejection due to the potential to operate in environments ranging from full sun on one side to a cold deep space environment, while rejecting a range of waste heat loads. NASA Technology Roadmap Area 14 identifies a turn down goal of 6 to 1 for a thermal control system. Room temperature thermal control systems are sought that are sized for nominal operation in full sun exposure, yet are able to maintain set point control and stable operation at one-sixth of their design heat load when in a deep space (0K) environment. Solutions for variable heat rejection may include novel architectures, novel thermal control fluids, advanced radiator technologies, and/or variable working fluid/radiator conductance. Radiator-based technologies should have an areal mass no greater	LM Space Systems	Jesus Isarraras	jesus.isarraras@lmco.com
View Online	A1.01	Structural Efficiency-Tailored Airframe & Structures	A primary goal of structural efficiency is to reduce structural mass. Reduced mass has the direct benefit of fuel burn savings, and it also influences noise and emissions by enabling advances in airframe configurations and in propulsion. The state of the art for lightweight airframe structures are carbon fiber reinforced polymeric composite structures which make up approximately 50% of the weight of Boeing's 787. Further improvements in structural efficiency above the state of the art are possible with tailored materials and structures. Tailored materials can improve the mechanical properties that directly affect structural mass, can provide functional properties that eliminate systems that add parasitic mass (e.g., to accommodate thermal, electrical, acoustic loads), or both. Tailored structures can improve the structural efficiency of existing airframe configurations and can enable new, non-traditional airframes. The tailoring covered for this subtopic solicitation is intended to apply to fuselage structures, and is further focused	LM Aeronautics (Aero) LM Missiles and Fire Control (MFC)	Craig Owens John Fontana	craig.l.owens@lmco.com john.c.fontana@lmco.com
View Online	A1.02	Quiet Performance - Airframe Noise Reduction	Innovative technologies and methods are necessary for the design and development of efficient, environmentally acceptable aircraft. In support of the Advanced Air Vehicles, Integrated Aviation Systems and Transformative Aero Concepts Programs, improvements in noise prediction, acoustic and relevant flow field measurement methods, noise propagation and noise control are needed for subsonic, transonic and supersonic vehicles targeted specifically at airframe noise sources and the noise sources due to the aerodynamic and acoustic interaction of airframe and engines.	LM Aeronautics (Aero)	Craig Owens	craig.l.owens@lmco.com

View Online	A1.03	Low Emissions Propulsion and Power-Turboelectric and Hybrid Electric Aircraft Propulsion	Proposals are sought for the development of enabling power systems, electric machines, power converters, and related materials that will be required for future small (9 + pax) to large (500 + pax) commercial transport vehicles which use turboelectric or hybrid electric power generation as part of the propulsion system. Turboelectric and hybrid electric power generation as well as distributed propulsive power have been identified as candidate transformative aircraft configurations with reduced fuel burn and emissions. However, components and management methods for power generation, distribution, and conversion are not currently available in the high power ranges with the necessary efficiency, power density, electrical stability and safety required for transport-class aircraft. Novel developments are	LM Aeronautics (Aero)	Craig Owens	craig.l.owens@lmco.com
View Online	A1.04	Aerodynamic Efficiency-Active Flow Control Actuators and Design Tools	NASAs Aeronautical Research Mission Directorate (ARMD) has developed the Strategic Implementation Plan (SIP) that describes its research plan for advancing aeronautics research to meet the aviation industrys demands over the next 25 years and beyond. One element of the plan focuses on developing ultra-efficient commercial vehicles. Improved vehicle efficiency will be achieved by reducing fuel burn and emissions. Active flow control (AFC) is a technology that has the potential to aid in achieving the efficiency goals of the next two generations of commercial vehicles. Active flow control is the on-demand addition of energy into a boundary layer for maintaining, recovering, or improving vehicle performance. AFC actuation methods have included steady mass transfer via suction or blowing, and unsteady perturbations created by zero net mass flux actuators, pulsed jets, and fluidic oscillators. Previous wind tunnel and flight tests demonstrated that this technology is capable of improving vehicle performance by reducing and/or eliminating separation and increasing circulation. When integrated into a transport aircraft, therefore, AFC would result in smaller control surfaces creating less drag and thereby less fuel consumption during flight. Widespread application of the technology on commercial transports, however, requires that AFC actuation systems be energy-efficient, reliant, and robust. Another challenging aspect of the design of the actuation system involves understanding how and where to integrate the actuator into the vehicle. Computational tool development is needed, in parallel with actuator development, to enable a more	LM Aeronautics (Aero) LM Missiles and Fire Control (MFC)	Craig Owens John Fontana	craig.l.owens@lmco.com john.c.fontana@lmco.com
View Online	A1.05	Computational Methods & Tools - High Fidelity Mesh and Geometry Tools	During 2012-2014, NASA sponsored a study aimed at determining future directions for Computational Fluid Dynamics (CFD) research that would subsequently enable significant advancements in aeronautics. This study (CFD 2030 Study: A Path to Revolutionary Computational Aerosciences (http://ntrs.nasa.gov/archive/nasa/casi.ntrs.nasa.gov/20140003093.pdf), noted many shortcomings in the existing technologies used for conducting high-fidelity simulations, and made specific recommendations for investments necessary to overcome these challenges. Chief among the recommendations was the need for robust higher-order discretization schemes, scalable solvers on high-performance computing (HPC) platforms, and adaptive h-p mesh refinement. It was recognized that the generation of meshes suitable for high-accuracy CFD simulations constitutes a principal bottleneck in the simulation workflow process as it requires significant human intervention. Similarly, providing access to the underlying geometry definition, as needed for both high-order simulations and adaptive gridding, is currently not available and is a further roadblock to the ubiquitous use of these technologies	LM Space Systems	Jesus Isarraras	jesus.isarraras@lmco.com
View Online	A1.06	Vertical Lift Technology	The Vertical Lift subtopic is primarily interested in innovative technologies to improve reliability and performance and reduce environmental impact of small-scale, autonomous, vertical lift UAVs	LM Aeronautics (Aero) LM Missiles and Fire Control (MFC) LM Rotary and Mission Systems, C4 & Undersea Systems (RMS C4USS)	Craig Owens John Fontana Michael Weingarten	craig.l.owens@lmco.com john.c.fontana@lmco.com michael.weingarten@lmco.com

View Online	A1.07	Propulsion Efficiency-Propulsion Materials and Structures	Materials and Structures research and development contributes to NASAs ability to achieve its long-term Aeronautics goals, including the development of advanced propulsion systems. Responding to this call will require a proposal describing the intent to conduct novel research in materials and structures that is linked to enhancing aircraft propulsion efficiency. Reductions in vehicle weight, fuel consumption and increased component durability/life will increase propulsion efficiency. The extreme temperature and environmental stability requirements of advanced aircraft propulsion systems demand the development of new, reliable, higher performance materials. Research in the areas of high-temperature metals/alloys and ceramics and polymers (and their composites) provides fundamental understanding of the underlying process-structure-property relationships of these materials. Study of the interactions of material systems with harsh environmental conditions and the modes of failure of these systems are of particular importance to developing more advanced materials for future aircraft propulsion systems, which will be operating at	LM Missiles and Fire Control (MFC)	John Fontana	john.c.fontana@lmco.com
View Online	A1.08	Aeronautics Ground Test and Measurements Technologies	NASA's ground-based test facilities, which include low speed, transonic, supersonic, and hypersonic wind tunnels, hypersonic propulsion integration test facilities, air-breathing engine test facilities, and simulation and loads laboratories, play an integral role in the design, development, evaluation, and analysis of advanced aerospace technologies and vehicles. In addition to design databases, these facilities provide critical data and fundamental insight required to understand complex phenomena and support the advancement of computational tools for modeling and simulation. The primary objective of the Aeronautics Ground Test and Measurements Technologies subtopic is to develop innovative tools and technologies that can be applied in NASAs ground-based test facilities to revolutionize wind tunnel testing and measurement capabilities and improve utilization and efficiency. For this solicitation, NASA seeks proposals for innovative research and development in the	LM Aeronautics (Aero)	Craig Owens	craig.l.owens@lmco.com
View Online	A1.09	Vehicle Safety- Internal Situational Awareness and Response	Achieving a vision for a safer and more efficient National Airspace (NAS) with increasing traffic and the introduction of new vehicle types requires increasingly intelligent vehicle systems able to respond to complex and changing environments in a resilient and trustworthy manner. Future air vehicles, especially autonomous vehicles, must operate with a high degree of awareness of their own well-being, and possess the internal intelligence to provide warning and potentially take action in response to off-nominal states. A vehicles capability to independently assure safety may be the only recourse in some situations, and addresses the recurring issue of inappropriate crew response. Further, early warning of impending maintenance conditions reduces maintenance cost and vehicle down-time through improved vehicle availability and throughput. Understanding the vehicle state also has impact on vehicle performance, efficiency, and environmental impact. This Subtopic seeks technologies to enable intelligent vehicle systems with an internal situational awareness and ability to respond to off-nominal conditions for piloted vehicles augmented with autonomous capabilities, as well as increasingly autonomous	LM Rotary and Mission Systems, Cyber, Ships and Advanced Technologies (RMS CSAT) LM Missiles and Fire Control (MFC)	Gretchen Head John Fontana	gretchen.head@lmco.com john.c.fontana@lmco.com
View Online	A1.10	Hypersonic Technology-Improvement in Solar Operability Predictions using Computational Algorithms	The improvement of isolator operability (as defined by unstart) and performance prediction are of import to a practical dual-mode scramjet design, since the operability limits determine the optimal performance bounds of the system. Due to uncertainties in these bounds, which are typically obtained via computations and/or experiments (and extrapolated to flight environments), one must accept degraded system performance. To this end, this solicitation seeks innovative concepts to significantly advance the state-of-the-art in the predictive capability of computational algorithms, with the ultimate goal of incorporating these advances into RANS-CFD algorithms, in order to both reduce and quantify the margins and uncertainty of the coupled inlet-isolator-combustor (engine) unstart mechanism/process, applicable to relevant flight regimes and relevant dual-mode scramjet designs.			

View Online	A2.01	Flight Test and Measurements Technologies	NASA continues to see flight research as a critical element in the maturation of technology. This includes developing test techniques that improve the control of in-flight test conditions, expanding measurement and analysis methodologies, and improving test data acquisition and management with sensors and systems that have fast response, low volume, minimal intrusion, and high accuracy and reliability. By using state-of-the-art flight test techniques along with novel measurement and data acquisition technologies, NASA and aerospace industry will be able to conduct flight research more effectively and also meet the challenges presented by NASA and industrys cutting edge research	LM Missiles and Fire Control (MFC)	John Fontana	john.c.fontana@lmco.com
View Online	A2.02	Unmanned Aircraft Systems Technology	Unmanned Aircraft Systems (UAS) offer advantages over manned aircraft for applications which are dangerous to humans, long in duration, require great precision, and require quick reaction. Examples of such applications include remote sensing, disaster response, delivery of goods, agricultural support, and many other known and yet to be discovered. In addition, the future of UAS promises great economic and operational advantages by requiring less human participation, less human training, an ability to take-off and land at any location, and the ability to react to	LM Aeronautics (Aero) LM Rotary and Mission Systems, Cyber, Ships and Advanced Technologies (RMS CSAT) LM Missiles and Fire Control (MFC) LM Rotary and Mission Systems, C4 & Undersea Systems (RMS C4USS)	Craig Owens Gretchen Head John Fontana Michael Weingarten	craig.l.owens@lmco.com gretchen.head@lmco.com john.c.fontana@lmco.com michael.weingarten@lmco.com
View Online	A3.01	Advanced Air Traffic Management Systems Concepts	This subtopic addresses user needs and performance capabilities, trajectory-based operations, and the optimal assignment of humans and automation to air transportation system functions, gate-to-gate concepts and technologies to increase capacity and throughput of the National Airspace System (NAS), and achieving high efficiency in using aircraft, airports, en-route and terminal airspace resources, while accommodating an increasing variety of missions and vehicle types, including full integration of Unmanned Aerial Systems (UAS) operations. Examples of concepts			
View Online	A3.02	Autonomy of the National Airspace Systems (NAS)	Develop concepts or technologies focused on increasing the efficiency of the air transportation system within the midterm operational paradigm (2025-2035 timeframe), in areas that would culminate in autonomy products to improve mobility, scalability, efficiency, safety, and cost-competitiveness. Proposals in the followings areas in productoriented research and development are sought, but are not limited to:	LM Rotary and Mission Systems, Cyber, Ships and Advanced Technologies (RMS CSAT)	Gretchen Head	gretchen.head@lmco.com
View Online	A3.03	Future Aviation Systems Safety	The Aeronautics Research Mission Directorate (ARMD) Airspace Operations and Safety Program (AOSP) is leading research in the area of integrated safety monitoring and assurance that detects, predicts and prevents safety problems in real-time. ARMD sees its future, safety-related research focused in a forward looking, more comprehensive systemwide direction and is currently vetting a roadmap for Real-Time System-Wide Safety Assurance (RSSA) strategic	LM Aeronautics (Aero)	Craig Owens	craig.l.owens@lmco.com
View Online	Z8.01	Small Spacecraft Propulsion Systems	There are currently a wide range of technologies for propulsion systems, however the miniaturization of these systems for small spacecraft is a particular challenge. While cold gas or pulsed plasma systems are targeted for small delta-v, v application, modules that can provide more demanding maneuvers still need development. Small spacecraft buses other than cubesats have more flexibility to accommodate systems with several thruster units to provide more attitude control and also large single axis maneuvers. Missions have demonstrated these technologies successfully and performance data gathered has paved the way for future modifications of the existing hardware in order to re-adapt	LM Space Systems	Jesus Isarraras	jesus.isarraras@lmco.com

View Online	Z8.02	Small Spacecraft Communication Systems	Space communications is an enabling capability to conduct NASA missions. Communications systems should impose the least possible constraints on mission spacecraft in order to meet required performance. Innovations and novel approaches are sought to reduce the mass, power consumption, volume, and operational constraints in order to increase the total data return, advance the technology readiness level, and reduce the cost and risk of communications systems for small spacecraft (generally considered to be on the order of 180 kg or less). Small spacecraft communication systems must be increasingly robust, flexible and diverse to support a wide variety of stand-alone and interconnected missions used by NASA to conduct space science, Earth science and exploration of the universe. Communication system components need to be able to operate over a range of environmental conditions, such as those imposed by launch vehicles and operations in space with appropriate levels of radiation tolerance. Infusion of new technologies or best commercial standards and practices (e.g., DVB-S2 standard, CubeSat form factors) that can demonstrably improve performance and be applied or adapted for use in Government, non-Government or commercial networks is	LM Space Systems	Jesus Isarraras	jesus.isarraras@lmco.com
View Online	Z8.03	Small Spacecraft Power and Thermal Control	SmallSats and CubeSats offer several new opportunities for space science, including multipoint in-situ measurements and disaggregation of larger science missions into constellations. These missions require reliable operation for several years in potentially harsh radiation environments. Industry has developed numerous cubesat components, but they lack the robustness needed for long duration missions. To address this capability gap, this subtopic will develop high reliability smallsat power generation and storage and thermal control systems that meet the performance and resource requirements of upcoming missions, while maximizing flexibility. An emphasis should be considered for energy management systems that combine power generation, storage and heat rejection in the compact cubesat platform as well as systems that enable electric propulsion.	LM Space Systems LM Space Systems	Brian Zimbelman Jesus Isarraras	brian.zimbelman@lmco.com jesus.isarraras@lmco.com
View Online	Z8.04	Small Spacecraft Structures, Mechanisms, and Manufacturing	Smallsats, including cubesats, are quickly maturing technologically towards advanced capabilities, which will result in significant contributions to the achievement of NASAs scientific and exploration missions. In fact, smallsats are seriously being considered for complex, long duration missions to deep space locations and for Earth observing constellations. However, while smallsats have the benefit of small size and mass making them generally easier and cheaper to launch, many space applications require larger physical sizes or alternate structural architectures. These applications can be realized through the innovative blending of structural elements with other functional elements; reconfigurable, reusable structures; reliable deployment mechanisms and aggregation techniques; and novel manufacturing techniques driving the utility of smallsats even further. Three main thrust areas are envisioned for this subtopic.	LM Space Systems	Jesus Isarraras	jesus.isarraras@lmco.com
View Online	Z8.05	Small Spacecraft Avionics and Control	Smallsats and cubesats offer several new opportunities for space science, including multipoint in-situ measurements and disaggregation of larger science missions into constellations. These missions require reliable operation for several years in potentially harsh radiation environments. Industry has developed numerous cubesat components, but they lack the robustness needed for long duration missions in harsh mission environments. To address this capability gap, this subtopic will develop high reliability smallsat avionics and control technologies that meet the performance and resource requirements of upcoming missions, while maximizing flexibility.	LM Space Systems	Jesus Isarraras	jesus.isarraras@lmco.com
View Online	Z9.01	Small Launch Vehicle Technologies and Demonstrations	As small spacecraft capabilities steadily expand the demand for low-cost dedicated launch capability is expected to grow and give rise to a viable small payload market segment. Servicing this market segment will likely require a variety of small launch vehicle capabilities to deliver payload masses ranging from 5-kg cubesats up to 180-kg ESPAClass spacecraft. Orbital altitudes of interest range between 350 to 700 km with inclinations between 28 to 98.2 degrees to support CONUS operators and sun synchronous orbits at maximum altitude. Affordability objectives are focused on reducing launch costs below $60,000/kg with a goal of less	LM Space Systems	Jesus Isarraras	jesus.isarraras@lmco.com

View Online	H8.01	ISS Utilization and Microgravity Research	NASA continues to invest in the near- and mid-term development of highly-desirable systems and technologies that provide innovative ways to leverage existing ISS facilities for new scientific payloads and to provide on orbit analysis to enhance capabilities. Additionally, NASA is supporting commercial science, engineering, and technology to provide low earth orbit commercial opportunities utilizing the ISS. Utilization of the ISS is limited by available upmass, down-mass, and crew time as well as by the capabilities of the interfaces and hardware already developed and in use. Innovative interfaces between existing hardware and systems, which are common to ground research, could facilitate both increased and faster payload development and subsequent utilization. Technologies that are portable and that can be matured rapidly for flight demonstration on the			
View Online	T1.01	Affordable Nano/Micro Launch Propulsion Stages	There has been recent significant growth in both the Quantity and Quality of Nano and Micro Satellite Missions: h The number of missions has outpaced available ride share opportunities. h Dedicated access to space increases small sat mission capability & allows new & emerging low-cost technologies to be flight qualified	LM Space Systems LM Space Systems	Brian Zimbelman Jesus Isarraras	brian.zimbelman@lmco.com jesus.isarraras@lmco.com
View Online	T1.01	Affordable Nano/Micro Launch Propulsion Stages	There has been recent significant growth in both the Quantity and Quality of Nano and Micro Satellite Missions: h The number of missions has outpaced available ride share opportunities. h Dedicated access to space increases small sat mission capability & allows new & emerging low-cost technologies to be flight qualified			
View Online	T1.02	Detailed Multiphysics Propulsion Modeling & Simulation Through Coordinated Massively Parallel Frameworks	Detailed modeling and simulation to assess combustion instability of recent large combustors while successful to a degree showed the need for significant advances in two-phase flow, combustion, unsteady flow, and acoustics. Additionally, simulation of water spray systems for launch acoustic sound suppression and test stand rocket engine acoustic sound suppression showed the need for advances in two-phase flow, droplet formation, and particulate trajectory. In these cases, and others, the need for improved physics based models is accompanied by the requirement	LM Space Systems	Jesus Isarraras	jesus.isarraras@lmco.com
View Online	T2.01	Advanced Nuclear Propulsion	The objective of this subtopic is to advance low TRL (<3) nuclear propulsion technologies that have the potential to transform space transportation and space exploration to Mars and other planets/moons in our solar system. Radical improvements in in-space propulsion technologies beyond the current state of the art (SOA) are required to enable new missions that safely transport humans and/or robotic systems with increased reliability to meet mission requirements, transport them quickly to reduce transit times and provide quicker scientific results, increase the payload mass to allow more capable instruments and larger crews, and reduce the overall mission cost. SOA in-space transportation systems typically employ chemical propulsion or electric propulsion systems. In parallel, thought must go into how best to ground test these concepts to allow a smoother, more efficient and safer path for future	LM Space Systems	Jesus Isarraras	jesus.isarraras@lmco.com

View Online	T3.01	Energy Harvesting, Transformation and Multifunctional Power Dissemination	The NRC has identified a NASA Top Technical Challenge as the need to "Increase Available Power". Additionally, a NASA Grand Challenge is "Affordable and Abundant Power" for NASA mission activities. As such, novel energy harvesting technologies are critical toward supporting future power generation systems to begin to meet these challenges. This subtopic addresses the potential for deriving power from waste engine heat, warm soil, liquids, kinetic motion, piezoelectric materials or other naturally occurring energy sources, etc. Development of energy harvesting (both capture and conversion) technologies would also address the national need for novel new energy systems and alternatives to reduce energy consumption. Conversion and transformation technologies for gathering energy naturally occurring in conjunction with induced energies are being pursued, and novel technologies capable of artificially saturating an environment with energy for storage and power dissemination along with non-conventional transmission via the surrounding environments such as wireless power are also applicable. Energy gathering is limited by the quantity of energy available within a systems immediate environment, and often the environments energy contains prolonged periods of lulls in harvestable energy. Technologically bridging power from a distance would fundamentally alleviate issues with low energy environments by allowing energy to be supplementally broadcast through preexisting structures and environments while simultaneously	LM Rotary and Mission Systems, Cyber, Ships and Advanced Technologies (RMS CSAT) LM Missiles and Fire Control (MFC) LM Rotary and Mission Systems, C4 & Undersea Systems (RMS C4USS)	Gretchen Head John Fontana Michael Weingarten	gretchen.head@lmco.com john.c.fontana@lmco.com michael.weingarten@lmco.com
View Online	T3.02	Intelligent/Autonomous Electrical Power Systems	Missions to Mars and beyond experience communication delays with Earth of between 3 to 45 minutes. Due to this, it is impractical to rely on ground-based support and troubleshooting in the event of a power system fault or component failure. Intelligent/autonomous systems are required that can manage the power system in both normal mode and failure mode.	LM Rotary and Mission Systems, C4 & Undersea Systems (RMS C4USS)	Michael Weingarten	michael.weingarten@lmco.com
View Online	T11.01	Machine Learning and Data Mining for Autonomy, Health Management, and Science	Nearly all engineered systems in all of NASA's areas of interest have one key aspect in common---they generate substantial data. These data represent: h Science and scientific applications. h The operations of the data collecting instruments and their platforms. h The health of these instruments and platforms. h In some cases, other related data such as the performance and	LM Missiles and Fire Control (MFC)	John Fontana	john.c.fontana@lmco.com
View Online	T11.02	Distributed Spacecraft Missions (DSM) Technology Framework	A Distributed Spacecraft Mission (DSM) is a mission that involves multiple spacecraft to achieve one or more common goals; some DSM Instances include Constellations, Formation Flying missions, or Fractionated missions. Apart from Science goals that can only be attained with DSM, distributed missions are usually motivated by several goals, among which: increasing data resolution in one or several dimensions (e.g., temporal, spatial, spectral or angular), decreasing launch costs, increasing data bandwidths, as well as ensuring data continuity and inter-mission validation and complementarity. Constellations have been proposed in several NASA Decadal Surveys and recent studies; in Earth Science (e.g., a multi-spacecraft Landsat for increasing temporal resolution), in Heliophysics (e.g., the Geospace Dynamics Constellation) or in Planetary Science (e.g., the Lunar Geophysical Network). Many constellations and Formation Flying missions have also been proposed more recently in cubesat-related research projects. For the purpose of this subtopic, we do not assume the spacecraft to be of any specific sizes, i.e., we do not			
View Online	T12.01	Advanced Structural Health Monitoring	Future manned space missions will require spacecraft and launch vehicles that are capable of monitoring the structural health of the vehicle and diagnosing and reporting any degradation in vehicle capability. This subtopic seeks new and innovative technologies in structural health monitoring (SHM) and integrated vehicle health management (IVHM) automated systems and analysis tools. Techniques sought include modular/low mass-volume systems, low power, low maintenance systems, and complete systems that reduce or eliminate wiring, as well as smart-sensor systems that provide processed data as close to the sensor and systems that are	LM Aeronautics (Aero)	Craig Owens	craig.l.owens@lmco.com

View Online	T4.01	Information Technologies for Intelligent and Adaptive Space Robotics	The objective of this subtopic is to develop information technologies that enable robots to better support space exploration. Improving robot information technology (algorithms, avionics, software) is critical to improving the capability, flexibility, and performance of future NASA missions. In particular, the NASA "Robotics and Autonomous Systems" technology roadmap (T04) indicates that extensive and pervasive use of robots can significantly enhance future exploration missions that are progressively longer, complex, and	LM Space Systems	Jesus Isarraras	jesus.isarraras@lmco.com
View Online	T4.02	Regolith Resources Robotics - R3	The use of robotics for In-Situ Resource Utilization (ISRU) in outer space on various planetary bodies is essential since it uses large quantities of regolith that must be acquired and processed. In some cases this will happen while the crew is not there yet, or it will take place at a remote destination where the crew cannot spend much time doing Extra Vehicular Activity (EVA) due to radiation exposure limits. Large communications latencies mandate autonomous robotics applications. Proposals are sought which provide solutions for the following regolith resources and robotics			
View Online	T6.01	Closed-Loop Living System for Deep-Space ECLSS with Immediate Applications for a Sustainable Planet	NASA's plans to explore space beyond Low Earth Orbit will push the performance of life support systems toward closed loop living systems. Deep space missions will require life support systems that will be self-sustaining since we cannot expect to carry enough spares and consumables for year-long missions. Achieving the development of such systems will provide the understanding for managing the limited availability of resources. The parallel with earth planetary resources management is useful as the world population grows and resources and infrastructure availability decreases. We anticipate that technologies developed for closed loop living systems could be made available to provide			
View Online	T6.02	Liquid Quantity Sensing Capability	In the current design of the Advanced Space Suit, the water necessary to provide cooling to the human and avionics is stored in the Feedwater Supply Assembly (FSA) which resides inside the habitable volume of the Space Suit. The FSA is a flexible reservoir which takes advantage of the suit pressure as the means of maintaining water loop pressure at operation conditions. During the EVA timeline, it is paramount that crew member cooling is uninterrupted. An interruption could cause overheating of the crew member. Therefore, insight in to the quantity of water remaining is			
View Online	T6.03	Modeling and Estimation of Integrated Human-Vehicle Design Influences	The development of human space exploration vehicles and habitats requires an understanding of the relationships and interactions among the technical and human crew aspects of the system. This STTR subtopic seeks to enable creation of modeling and estimation capabilities that will inform system design decisions for enhancing mission success, crew task performance, and crew safety while reducing technical resource demands such as those on mission mass, power, volume and crew time. Currently there is no integrated framework in which to perform system design trades among various vehicle design capabilities taking into account the wide range of roles of the human crewmembers such as mission task performers, vehicle inhabitants, and even medical patients and caregivers. Life support inputs and outputs are accommodated in design considerations; however, this scope provides incomplete coverage of the human interactions with the system design. Just as vehicle and component life-cycle issues must be considered in system design, human adaption throughout a mission in areas such as individual and team behavioral health, physiological performance and clinical health must be folded in to inform vehicle			
View Online	T7.01	Advanced Bioreactor Development for In-Situ Microbial Manufacturing	NASAs future long-duration missions require a high degree of materials recovery and recycling as well as the ability to manufacture required mission resources in-situ. While physico-chemical methods offer potential advantages for the production of many products, biological systems are able to manufacture a wide range of materials that are not yet possible with abiotic systems. Microbial systems are currently being developed by academic institutions, industry, and government agencies to produce a wide array of products that are applicable to space missions. Relevant mission resources include, but are not limited to, food, nutrients,			

View Online	T7.02	Space Exploration Plant Growth	Producing food for crew consumption is an important goal for achieving Earth independence and reducing the logistics associated with future exploration missions. NASA seeks innovative technologies to enable plant growth systems for food production for in-space and planetary exploration missions.			
View Online	T8.01	Technologies for Planetary Compositional Analysis and Mapping	This subtopic is focused on developing and demonstrating technologies for both orbital and in-situ compositional analysis and mapping that can be proposed to future planetary missions. Technologies that can increase instrument resolution, precision and sensitivity or achieve new and innovative scientific measurements are solicited. For example missions, see (http://science.hq.nasa.gov/missions). For details of the specific requirements see the National Research Councils, Vision and Voyages for Planetary Science in the Decade 2013-2022			
View Online	T8.02	Photonic Integrated Circuits	Integrated photonics generally is the integration of multiple lithographically defined photonic and electronic components and devices (e.g., lasers, detectors, waveguides/passive structures, modulators, electronic control and optical interconnects) on a single platform with nanometer-scale feature sizes. The development of photonic integrated circuits permits size, weight, power and cost reductions for spacecraft microprocessors, communication buses, processor buses, advanced data processing, and integrated optic science instrument optical systems, subsystems and components. This is particularly critical for small spacecraft platforms. On July 27, 2015 - Vice President Joe Biden, at an event in Rochester, NY, announced the New York consortium has been selected to lead the Integrated Photonics Institute for Manufacturing Innovation. For details see (http://manufacturing.gov/ip-imi.html). Proposed as part of President Obamas National Network for Manufacturing Innovation (NNMI), the IP-IMI was established to bring government, industry and academia together to advance state-of-the-art photonics technology and better position the United States relative to global competition in this critical field. The use of the IP-IMI for work proposed under this topic is highly encouraged. This topic solicits methods, technology and systems for development and incorporation of active and passive circuit elements for integrated photonic circuits for:	LM Space Systems LM Missiles and Fire Control (MFC)	Jesus Isarraras John Fontana	jesus.isarraras@lmco.com john.c.fontana@lmco.com
View Online	T13.01	Intelligent Sensor Systems	Rocket propulsion development is enabled by rigorous ground testing in order to mitigate the propulsion system risks that are inherent in spaceflight. Test articles and facilities are highly instrumented to enable a comprehensive analysis of propulsion system performance. This topic area seeks to develop advanced instrumentation technologies which can be embedded in systems and subsystems. The goal is to provide a highly flexible instrumentation solution capable of monitoring remote or inaccessible measurement locations. All this while eliminating cabling and auxiliary power. It is focused on near-term products that augment and enhance proven, state-of-the-art propulsion test facilities. Rocket propulsion test facilities within NASA provide excellent test beds for testing and using the innovative technologies discussed above. The technologies developed would be capable of addressing multiple mission requirements for remote monitoring such as vehicle health	LM Space Systems LM Space Systems	Brian Zimbelman Jesus Isarraras	brian.zimbelman@lmco.com jesus.isarraras@lmco.com
View Online	T15.02	Bio-inspired and Biomimetic Technologies and Processes for Earth and Space	Biomimicry is the imitation of life, natural systems and life's principles characterized by reduced use of energy, water and raw materials. Energy and material use is minimized through information and structure. The goal of this topic is to focus efforts on system driven technology development that draws from nature to solve technical challenges in aeronautics and space exploration. While most of the areas described here pertain to aeronautics, biological models have multiple applications and cross cutting solutions are also	LM Missiles and Fire Control (MFC)	John Fontana	john.c.fontana@lmco.com

View Online	T12.02	Technologies to Enable Novel Composite Repair Methods	As composite structures become more prevalent on launch vehicles, it will become necessary to have the capability to inspect and repair these structures during ground processing prior to launch. Current composite repair methods developed for the aviation industry are time consuming and require complex infrastructure in order to restore the structural strength. Aerospace structures have structural and thermal profiles which are different than aircraft and require different considerations; for example, unlike a commercial aircraft, a launch vehicle sees high loading but is only a one time use vehicle. Advancements are needed to repair materials and methods which allow for a structural repair to be performed in locations with minimal access and in a short time frame. Small damages may be accepted by analysis with no repair. Large damages may require extensive repair or component replacement. This subtopic focuses on developing novel composite repair methods for damages that fall in between these two categories. These	LM Aeronautics (Aero)	Craig Owens	craig.l.owens@lmco.com
View Online	T12.03	Thin-Ply Composites Design Technology and Applications	The use of thin-ply composites is one area of composites technology that has not yet been fully explored or exploited by NASA. Thin-ply composites are those with cured ply thicknesses below 0.0025 and commercially available prepregs are now available with ply thicknesses as thin as 0.00075. By comparison, a standard-ply-thickness composite would have a cured ply thickness of approximately 0.0055. Thin-ply composites hold the potential for reducing structural mass and increasing performance due to their unique structural characteristics, which include	LM Aeronautics (Aero) LM Missiles and Fire Control (MFC)	Craig Owens John Fontana	craig.l.owens@lmco.com john.c.fontana@lmco.com
View Online	T12.04	Experimental and Analytical Technologies for Additive Manufacturing	Additive manufacturing is becoming a leading method for reducing costs, increasing quality, and shortening schedules for production of innovative parts and component that were previously not possible using more traditional methods of manufacturing. In the past decade, methods such as selective laser melting (SLM) have emerged as the leading paradigm for additive manufacturing (AM) of metallic components, promising very rapid, cost-effective, and ondemand production of monolithic, lightweight, and arbitrarily intricate parts directly from a CAD file. In the push to commercialize the SLM technology, however, the modeling of the AM process and physical properties of the resulting artifact were paid little attention. As a result, commercially available systems are based largely on hand-tuned parameters determined by trial and error for a limited set of metal powders. The system operation is far from optimal or efficient, and the uncertainty in the performance of the produced component is too large. This, in turn, necessitates a long and costly certification process, especially in a highly risk-aware community such as aerospace. Modeling and real time process control of selective laser melting is needed coupled with statistically significant correlations and understanding of the important process parameters and the resultant microstructural and mechanical properties, validated with detailed metallurgical investigations of the as-fabricated	LM Aeronautics (Aero) LM Space Systems LM Missiles and Fire Control (MFC) LM Rotary and Mission Systems, C4 & Undersea Systems (RMS C4USS)	Craig Owens Jesus Isarraras John Fontana Michael Weingarten	craig.l.owens@lmco.com jesus.isarraras@lmco.com john.c.fontana@lmco.com michael.weingarten@lmco.com
View Online	T1.03	Real Time Launch Environment Modeling and Sensing Technologies	Launch and landing operations through the atmosphere of a planet are strongly affected by environmental and atmospheric conditions. Even the most robust vehicle design has physical limits that restricts the conditions through which it can be launched. Divergent fluid dynamics, lightning, and other severe conditions can overstress vehicle structures and cause a mishap. In addition, the safety of personnel performing launch preparations must be protected from extreme weather such as lightning in a manner that minimizes risk to the launch schedule. A key metric of launch architecture is the overall systems launch availability, which is in turn impacted by the accuracy with which the environmental conditions can be characterized. Advanced technologies are being solicited to improve the accuracy of launch and landing environment forecasting and evaluation. This technology is of interest not only for earth-based launches, but also to enable routine launch and landing activity on other planets such as Mars, where range infrastructure will be extremely limited. Specific areas of interest			

View Online	T15.01	Distributed Electric Propulsion Aircraft Research	Distributed Electric Propulsion (DEP) Aircraft employ multiple electric propulsors to achieve unprecedented performances in air vehicles. The propulsor could be ducted/un-ducted fans, propellers, cross-flow-fans, etc. Some of the benefits identified using this propulsion system are reductions in fuel burn/energy usage, noise, emissions, and/or field length. Addressing ARMDs Strategic Thrust #3 (Ultra-Efficient Commercial Vehicles) and #4 (Transition to Low-Carbon Propulsion), innovative approaches in designing and analyzing the DEP aircraft are	LM Aeronautics (Aero)	Craig Owens	craig.l.owens@lmco.com
View Online	T4.03	Coordination and Control of Swarms of Space Vehicles	This subtopic is focused on developing and demonstrating technologies for coordination and autonomous control of teams and swarms of space systems including but not limited to spacecraft and planetary rover teams in a dynamic environment	LM Space Systems LM Missiles and Fire Control (MFC)	Jesus Isarraras John Fontana	jesus.isarraras@lmco.com john.c.fontana@lmco.com
View Online	A17A-T001	Atomic Layer Deposition of Highly Conductive Metals	Atomic Layer Deposition (ALD) techniques have established the ability to grow conformal, defect free films over large areas, atomic layer by atomic layer. While many dielectric, semiconductor, and metal materials have been deposited with ALD, the metals with the highest electrical conductivity have not been demonstrated in a reproducible manufacturing environment. The objective of this solicitation is to demonstrate ALD deposition of a very thin (<10 nm thick), highly conductive, continuous layer of silver, copper, gold, or aluminum on a dielectric substrate.	LM Missiles and Fire Control (MFC)	John Fontana	john.c.fontana@lmco.com
View Online	A17A-T002	High Efficient Flexible Perovskite Photovoltaic Modules for Powering Wireless Sensor Nodes and Recharging Batteries	Design, fabricate, and demonstrate flexible perovskite solar modules (12"x12") providing efficiency greater than 20% under AM 1.5G standard solar spectrum with stability under up to 50C of temperature and up to 80% of humidity. Demonstrate the modules for direct powering of wireless sensor nodes and battery recharging operation for wearable electronics relevant to defense platforms.	LM Rotary and Mission Systems, Cyber, Ships and Advanced Technologies (RMS CSAT)	Gretchen Head	gretchen.head@lmco.com
View Online	A17A-T003	Photonic Nanostructures for Manipulation of High Energy Coherent Beams	This STTR effort seeks to investigate novel approaches using multilayered hybrid 2-dimensional nanostructures as passive coatings and evaluate their interactions with high energy lasers.	LM Missiles and Fire Control (MFC) LM Space Systems - SMD	John Fontana Jeff Bowers	john.c.fontana@lmco.com jeff.bowers@lmco.com
View Online	A17A-T004	Functional Additive Manufacturing for Printable & Networkable Sensors to Detect Energetics and Other Threat Materials	Explosive & chem-bio (CB) sensors are necessary to provide situational awareness and early warning against threat events from homemade explosives and weapons of mass destruction (WMD), to protect personnel and assets in missions ranging from integrated base defense to forward operating bases and reconnaissance. The Department of Defense is interested in reducing costs, labor, and footprint while enhancing situational awareness and early warning to compress the time from threat event to commander decision. Small, low-cost, autonomous sensors are needed for modular, self-scaling, persistent, layered" surveillance networks. There is a desire to develop a sensor in a functional form similar to a smoke alarm. A smoke alarm exists in a small package and can run for more than a year on a single 9 volt battery. Low power and low profile are very desirable characteristics.	LM Rotary and Mission Systems, Cyber, Ships and Advanced Technologies (RMS CSAT) LM Missiles and Fire Control (MFC) LM Space Systems - SMD	Gretchen Head John Fontana Jeff Bowers	gretchen.head@lmco.com john.c.fontana@lmco.com jeff.bowers@lmco.com
View Online	A17A-T005	Mid-Infrared Chip-scale Trace Gas Sensors	To develop trace gas sensors on a chip with mid-infrared laser based spectroscopy techniques such as absorption spectroscopy with a broad wavelength span of 3-15 microns and sub-ppm sensitivity.	LM Aeronautics (Aero) LM Missiles and Fire Control (MFC)	Craig Owens John Fontana	craig.l.owens@lmco.com john.c.fontana@lmco.com
View Online	A17A-T006	Mid-wave Infrared Laser Beam Steering	The development of a monolithic beam steerable mid-wave infrared laser with average power output exceeding 10W.	LM Rotary and Mission Systems, Cyber, Ships and Advanced Technologies (RMS CSAT) LM Missiles and Fire Control (MFC)	Gretchen Head John Fontana	gretchen.head@lmco.com john.c.fontana@lmco.com
View Online	A17A-T007	High Dynamic Range Heterodyne Terahertz Imager	Design, construct, and deliver an imager operating in the 1-5 THz region with a frequency tunable source, a high dynamic range heterodyne receiver, and wavelength-scale spatial resolution.	LM Space Systems LM Missiles and Fire Control (MFC)	Jesus Isarraras John Fontana	jesus.isarraras@lmco.com john.c.fontana@lmco.com
View Online	A17A-T008	3D Tomographic Scanning Microwave Microscopy with Nanometer Resolution	Develop near-field scanning microwave microscopy hardware and software to enable 3D tomographic imaging of the structural and electromagnetic properties of electronic and biological materials with nanometer spatial resolution	LM Missiles and Fire Control (MFC)	John Fontana	john.c.fontana@lmco.com
View Online	A17A-T009	Mechanochemical Sensing and Self-Healing Solution to Detecting Damage in Composite Structures	Engineer and utilize mechanochemical reactions to initiate a molecular response to macroscopic force and/or deformation in polymeric materials, and to provide an active reinforcement mechanism within composite materials for stress-sensing and self-healing capabilities.	LM Aeronautics (Aero) LM Rotary and Mission Systems, C4 & Undersea Systems (RMS C4USS)	Craig Owens Michael Weingarten	craig.l.owens@lmco.com michael.weingarten@lmco.com
View Online	A17A-T010	Scientific Data Management via Fast Dynamic Summarization	Develop new algorithms to accurately, compactly, and efficiently summarize large amounts of data on existing petascale and future exascale systems. These will be used to (i) minimize communication/data movement by passively coordinating statistical data compression across nodes, (ii) find anomalies in data in real time by supporting fast likelihood estimation for data as it is generated, and therefore, (iii) perform on-the-fly data curation, reduction, analysis and visualization across nodes.	LM Space Systems LM Missiles and Fire Control (MFC) LM Space Systems - SMD	Jesus Isarraras John Fontana Jeff Bowers	jesus.isarraras@lmco.com john.c.fontana@lmco.com jeff.bowrs@lmco.com
View Online	A17A-T011	Synthetic Biology Toolkit for Bioconversion of Food Waste	Develop a Clostridium molecular toolkit that enable engineering of Clostridium species (spp.) to convert food waste to fuel or other intermediates of value to reduce waste removal costs and to improve sustainability in the field.			

View Online	A17A-T012	High Performance Armor via Additive Advanced Ceramics	To develop, improve and demonstrate newly introduced additive manufacturing (AM) technology capable of producing advanced material components consisting of alumina, silicon carbide and/or boron carbide and validate its use in high performance applications such as armor components.	LM Aeronautics (Aero) LM Missiles and Fire Control (MFC)	Craig Owens John Fontana	craig.l.owens@lmco.com john.c.fontana@lmco.com
View Online	A17A-T013	Scalable Manufacturing of Functional Yarns for Textile-based Energy Storage	Design scalable manufacturing processes that produce yarns that can store energy and can be knit or woven into wearable textiles capable of storing energy.	LM Rotary and Mission Systems, Cyber, Ships and Advanced Technologies (RMS CSAT) LM Space Systems - SMD	Gretchen Head Jeff Bowers	gretchen.head@lmco.com jeff.bowers@lmco.com
View Online	A17A-T014	Biosensor for Detection of Synthetic Cannabinoids	Develop a drug identification kit that utilizes biomolecular receptor-ligand interactions to detect the presence of cannabinoids.	LM Missiles and Fire Control (MFC)	John Fontana	john.c.fontana@lmco.com
View Online	A17A-T015	Sealed Container Content Identification	To develop a compact and rugged, computer-aided device for use by chemical-biological defense forces that is capable of identifying the contents of liquid-filled containers while making contact with the container or at short stand-off without having to drill or otherwise penetrate the container.	LM Missiles and Fire Control (MFC)	John Fontana	john.c.fontana@lmco.com
View Online	A17A-T016	Method for Locally Measuring Strength of a Polymer-Inorganic Interface During Cure and Aging	Develop and demonstrate a method to locally measure quality of the interface in an adhesive system (metal substrate/polymeric resin) during resin curing and during aging under hot/wet conditions.	LM Aeronautics (Aero) LM Missiles and Fire Control (MFC)	Craig Owens John Fontana	craig.l.owens@lmco.com john.c.fontana@lmco.com
View Online	A17A-T017	Dismounted Soldier Positioning, Navigation and Timing (PNT) System Initialization	Develop and demonstrate techniques and algorithms to accomplish the initialization of Dismounted Navigation Systems while en route within a tactical vehicle permitting the transition from the vehicle to the fight completely without the need to manually calibrate or initialize the navigation system. Currently military Global Positioning System (GPS) receivers can take a few minutes to acquire satellites and the alignment of Inertial Measurement Units (IMU) up to four minutes, which must occur outside the vehicle, in plain sight, all while standing completely still.	LM Missiles and Fire Control (MFC) LM Space Systems - SMD	John Fontana Jeff Bowers	john.c.fontana@lmco.com jeff.bowers@lmco.com
View Online	A17A-T018	Novel Robust IR Scene Projector Technology	The IRSP system will project accurate, dynamic, realistic infrared scenes of various targets that will provide repeatable test and evaluation (T&E) of sensors employing state-of-the-art infrared imaging technology.	LM Space Systems LM Missiles and Fire Control (MFC)	Jesus Isarraras John Fontana	jesus.isarraras@lmco.com john.c.fontana@lmco.com
View Online	A17A-T019	Artificial Intelligence/Machine Learning to Improve Maneuver of Robotic/Autonomous Systems	The goal of this topic would be to improve off-road autonomous mobility in military environments as mentioned above using relatively low-cost or COTS sensors while combining them with novel memory techniques.	LM Missiles and Fire Control (MFC)	John Fontana	john.c.fontana@lmco.com
View Online	A17A-T020	Bioaerosol Detector Wide Area Network	Develop a novel real-time fusion approach for a bioaerosol detector network with emphasis on high value target protection.	LM Missiles and Fire Control (MFC)	John Fontana	john.c.fontana@lmco.com
View Online	A17A-T021	Anticipatory Analytics for Environmental Stressors	Develop a data analysis platform to explore linkages between environmental stress and security. The objective is to develop a platform that can integrate geospatial and temporal data for a range of environmental stressors while contextualizing them with information about local communities including properties such as coping capacity, adaptive capacity, and resilience. The platform should enable linkages between environmental stressors and security outcomes including conflict, political instability, and population displacement. This platform should be implementable as a community tool that can be easily integrated into existing Engineer Research and Development Center (ERDC) systems and analyses to support military reach-back, training, and planning within Combatant Commands and Army Service Component Commands.	LM Missiles and Fire Control (MFC)	John Fontana	john.c.fontana@lmco.com
View Online	A17A-T022	Biomechanical Rat Testing Device to Validate Primary Blast Loading Conditions for Mild Traumatic Brain Injury	Develop a biomechanical surrogate of a rat model that can accurately measure shock overpressure conditions. This surrogate device will be used in live-fire testing as well as many different types of experimental shock tubes in laboratories to gauge the fidelity of the experimental technique in simulating field conditions. The device will also measure the actual biomechanical loading experienced by the experimental animals so that the research results of that particular laboratory can then be cross-correlated across different test conditions and research groups.			
View Online	A17A-T023	Field Verification of Micro/Ultra Filtration	Design a novel approach and deliver a device that will verify micro/ultra filtration for expeditionary water purification systems.			
View Online	A17A-T024	Additive Manufactured Smart Structures with Discrete Embedded Sensors	Development of a hybrid additive manufacturing / 3D printing method capable of printing polymer and/or metallic smart structures with embedding electronic devices, such as sensors, accelerometers, antennas, tracking systems, etc.	LM Aeronautics (Aero) LM Rotary and Mission Systems, Cyber, Ships and Advanced Technologies (RMS CSAT) LM Space Systems LM Missiles and Fire Control (MFC) LM Rotary and Mission Systems, C4 & Undersea Systems (RMS C4USS) LM Space Systems - SMD	Craig Owens Gretchen Head Jesus Isarraras John Fontana Michael Weingarten Jeff Bowers	craig.l.owens@lmco.com gretchen.head@lmco.com jesus.isarraras@lmco.com john.c.fontana@lmco.com michael.weingarten@lmco.com jeff.bowers@lmco.com
View Online	N17A-T001	Electro-Optic Transmissive Scanner	Develop Thin, Light Weight, Low Power, Large Aperture, Electro-Optic Transmissive Scanner	LM Missiles and Fire Control (MFC)	John Fontana	john.c.fontana@lmco.com

View Online	N17A-T002	Multi-Phase Flame Propagation Modeling for Present and Future Combustors and Augmentors	Accurately characterize the effect of liquid fuel spray on gas phase turbulent combustion and develop a physics-based spray model that can be implemented in a computationally-efficient manner to effectively balance the species, mass, momentum, and energy between a fuel spray and its turbulent combustion flow field.			
View Online	N17A-T003	Ignition Modeling for Present and Future Combustors and Augmentors	Develop an analysis tool that implements a fully functional physics-based computational model to characterize the likelihood of ignition in combustors and augmentors for various configurations of flight conditions and engine hardware.			
View Online	N17A-T004	Complex-Knowledge Visualization Tool	Develop a decision support tool that translates and synthesizes cognitive and learning science which is contained primarily in the academic literature, into information that is useful and usable by senior management when they make decisions about training and performance investments and acquisitions.	LM Space Systems - SMD	Jeff Bowers	jeff.bowers@lmco.com
View Online	N17A-T005	Reduce Order Airwake Modeling for Aircraft/Ship Integration Modeling and Simulation	Develop efficient and accurate real-time reduced order modeling (ROM) methods for four-dimensional computational fluid dynamics (CFD) predicted ship airwake data. Develop user friendly tools to process CFD datasets to create ROMs and to implement ROMs in shipboard simulation in a plug and play manner.	LM Rotary and Mission Systems, Cyber, Ships and Advanced Technologies (RMS CSAT) LM Rotary and Mission Systems, C4 & Undersea Systems (RMS C4USS)	Gretchen Head Michael Weingarten	gretchen.head@lmco.com michael.weingarten@lmco.com
View Online	N17A-T006	Efficient Mid-Wave Infrared Quantum Cascade Lasers with Room-Temperature Wall-Plug Efficiency over 40%	Develop quantum cascade lasers (QCLs) with emission at ~4.6 micron and wall-plug efficiency over 40% at room temperature. The output power of a single QCL should emit over 10W output power in continuous wave (CW) mode while maintaining excellent beam quality with M2 < 1.5.	LM Rotary and Mission Systems, Cyber, Ships and Advanced Technologies (RMS CSAT)	Gretchen Head	gretchen.head@lmco.com
View Online	N17A-T007	Innovative Packaging to Achieve Extremely Light Weight Sensor Pod Systems	Develop extremely light weight Pod capable of supporting modular sensor components for Unmanned Aerial Vehicle without sacrificing strength and durability.	LM Aeronautics (Aero) LM Missiles and Fire Control (MFC)	Craig Owens John Fontana	craig.l.owens@lmco.com john.c.fontana@lmco.com
View Online	N17A-T008	Mitigation or Prevention of Aging Effects in Hydrocarbon Missile Fuels	Develop new materials, methods, processes and prototypes that address problems associated with aging effects in hydrocarbon missile fuels such that future advanced fuels are not as susceptible to aging, and current fuel (i.e. JP-10) returning to the factory in missiles for recertification or demilitarization can be reused, without changing the fuel if possible.			
View Online	N17A-T009	Prediction of Rotor Loads from Fuselage Sensors for Improved Structural Modeling and Fatigue Life Calculation	Develop an innovative, physics based system which incorporates measurements taken by small, unobtrusive sensors located within the fuselage to accurately predict rotor head loads generated during all phases of flight, including turbulent flow, buffeting, and the influence of tail rotor interactions.			
View Online	N17A-T010	End-User Speech Recognition Support Tools for Crew Resource Management Training Systems	Develop an innovative software capability to improve the utility of structured automatic speech recognition (ASR) by allowing end-users to customize the set of supported utterances without external support.			
View Online	N17A-T011	High Density Capacitors for Compact Transmit and Receive Modules	Develop high-density capacitors that are robust, reliable, and highly compact for power conversion energy storage and filtering to reduce the size, weight, and manufacturing cost of transmit and receive modules.	LM Missiles and Fire Control (MFC) LM Rotary and Mission Systems, C4 & Undersea Systems (RMS C4USS) LM Space Systems - SMD	John Fontana Michael Weingarten Jeff Bowers	john.c.fontana@lmco.com michael.weingarten@lmco.com jeff.bowers@lmco.com
View Online	N17A-T012	Innovative Material Handling System for the Expeditionary Mobile Base (ESB) Class Ship	Develop an innovative Material Handling System elevator that can be installed on an Expeditionary Base Mobile (ESB) so that aircraft and cargo can be transferred from the flight deck to the mid or mission bay and transfer boats from mission bay to the sea.			
View Online	N17A-T013	Low Cost Magnetic Sensor for Mine Neutralizer Identification and Charge Placement	Develop a low cost Tactical Decision Aid (TDA) magnetic or electromagnetic induction sensor to provide an additional identification (ID) capability for mine neutralizers in murky water or with limited communications link as well as a precise positioning capability for buried mine neutralization.	LM Missiles and Fire Control (MFC) LM Rotary and Mission Systems, C4 & Undersea Systems (RMS C4USS) LM Rotary and Mission Systems, Integrated Warfare Systems & Sensors (RMS IWSS)	John Fontana Michael Weingarten Rebecca Gerskhovich	john.c.fontana@lmco.com michael.weingarten@lmco.com rebecca.gershkovich@lmco.com
View Online	N17A-T014	Advanced Material System for Reduced Wave Slam Energy in Combatant Craft	Develop a low-cost advanced material system for combatant craft to reduce the energy transferred to seated occupants during severe wave-slam events in craft operating at high speeds in rough seas.	LM Rotary and Mission Systems, C4 & Undersea Systems (RMS C4USS)	Michael Weingarten	michael.weingarten@lmco.com
View Online	N17A-T015	Development of Explosive Non-Acoustic Sensing on Remotely Operated Vehicles for Littoral Threat Characterization in Complex Seabed Environments	Develop novel methods and/or technologies for a combination of ambient, passive sensing and/or controllable, active source sensing and multi-sensor fusion solutions in order to improve subsea target characterization of mines, UW-IEDs, and UXO on a ROV platform.	LM Missiles and Fire Control (MFC) LM Rotary and Mission Systems, C4 & Undersea Systems (RMS C4USS)	John Fontana Michael Weingarten	john.c.fontana@lmco.com michael.weingarten@lmco.com
View Online	N17A-T016	Improved Infrared Imaging with Variable Resolution Achieved via Post-Processing	Develop imaging technology in the Mid Wave Infrared (MWIR) band with variable resolution achieved via software-coded post-processing algorithms that reduces cost and provides higher effective-resolution.	LM Missiles and Fire Control (MFC) LM Rotary and Mission Systems, C4 & Undersea Systems (RMS C4USS)	John Fontana Michael Weingarten	john.c.fontana@lmco.com michael.weingarten@lmco.com
View Online	N17A-T017	Learning Centered Technology and Innovative Instructional Methods for Anti-Submarine Warfare University	Develop innovative training curriculum design and training technologies for high velocity learning by ASW personnel.	LM Rotary and Mission Systems, C4 & Undersea Systems (RMS C4USS) LM Rotary and Mission Systems, Integrated Warfare Systems & Sensors (RMS IWSS)	Michael Weingarten Rebecca Gerskhovich	michael.weingarten@lmco.com rebecca.gershkovich@lmco.com

View Online	N17A-T018	Volumetric Atmospheric Modeling from Point Measurements or a Single Profile	Develop a model or process to utilize point weather measurements collected in-situ to estimate an atmospheric spatial distribution.	LM Rotary and Mission Systems, Cyber, Ships and Advanced Technologies (RMS CSAT)	Gretchen Head	gretchen.head@lmco.com
View Online	N17A-T019	Reduced Cavitation, High Efficiency Outboard Propulsors for Small Planing Craft	Develop and demonstrate one or more advanced propulsion concepts driven by a 50-hp outboard motor that would significantly improve the performance of a 50-hp outboard motor pumpjet propulsor, using clean-slate explorations of advanced impeller blade and duct/shroud geometries, boundary layer manipulation, propulsor materials and shaft/drive arrangements or pumpjets/ducted props. This propulsion concept should be swappable with a commercial lower propulsor unit for the outboard engine demonstrator.	LM Rotary and Mission Systems, C4 & Undersea Systems (RMS C4USS)	Michael Weingarten	michael.weingarten@lmco.com
View Online	N17A-T020	Phase-Change Materials for Tunable Infrared Devices	Develop an active infrared element that is capable of providing dynamic narrow-band spectral properties to provide next-generation control of the electromagnetic spectrum from the mid to long wave infrared (3-12 um) for Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance (C4ISR) Naval applications	LM Missiles and Fire Control (MFC)	John Fontana	john.c.fontana@lmco.com
View Online	N17A-T021	Multi Modal Video Summarization	Develop a video summarization capability by leveraging computer vision, audio processing and a range of natural language processing technologies. The capability should fuse information from imagery and audio in order to infer delivery method, context, content, intent and pedigree	LM Missiles and Fire Control (MFC) LM Rotary and Mission Systems, C4 & Undersea Systems (RMS C4USS)	John Fontana Michael Weingarten	john.c.fontana@lmco.com michael.weingarten@lmco.com
View Online	N17A-T022	Data Extractor for Event Pattern Archiving	Develop technology to auto-extract data relevant to significant events and to archive patterns. The Science and Technology (S&T) challenge is to create intelligent algorithms for building event context awareness to associate areas, timelines and data sources of relevance to preserve essential data collection in a form for efficient recall and analytics.	LM Missiles and Fire Control (MFC) LM Space Systems - SMD	John Fontana Jeff Bowers	john.c.fontana@lmco.com jeff.bowers@lmco.com
View Online	N17A-T023	Degraded Synthetic Training	Design, develop and demonstrate an architecture and cyber threat simulation software that can safely, securely, and realistically degrade critical surface warfare capabilities in support of Fleet mission assurance and Continuity of Operations (COOP) training requirements.			
View Online	N17A-T024	Adaptive Optics for Nonlinear Atmospheric Propagation of Laser Pulses	To develop novel adaptive optics concepts to control and extend the atmospheric propagation of laser pulses with peak powers sufficient to access nonlinear self-focusing in air and laser bandwidths sufficient to enable significant temporal compression over kilometer-scale propagation distances	LM Space Systems LM Missiles and Fire Control (MFC)	Jesus Isarraras John Fontana	jesus.isarraras@lmco.com john.c.fontana@lmco.com
View Online	N17A-T025	Innovative Collaboration for Unmanned Aerial and Dissimilar Systems	Goal is to develop innovative software and hardware solutions enabling collaborative efforts between unmanned aerial and dissimilar systems, such as ground and sea vehicles, that results in synergistic behavior and allow unmanned aerial platforms to be used to accomplish more complex missions through real-time perception and sensor data sharing. Achieving this goal will leverage recent advances in miniaturization and sensing, autonomous landing and collision avoidance, semantic mapping, and could enable ways for teams of different types of unmanned systems to operate.	LM Missiles and Fire Control (MFC) LM Rotary and Mission Systems, C4 & Undersea Systems (RMS C4USS)	John Fontana Michael Weingarten	john.c.fontana@lmco.com michael.weingarten@lmco.com
View Online	N17A-T026	Improved High-Frequency Bottom Loss Characterization	Replace the empirical Naval Oceanographic High Frequency Bottom Loss (HFBL) curves with new parameterization for the seabed that includes an improved basis in physics.	LM Rotary and Mission Systems, C4 & Undersea Systems (RMS C4USS)	Michael Weingarten	michael.weingarten@lmco.com
View Online	N17A-T027	Energy Efficient, Non-Silicon Digital Signal Processing (DSP)	Develop an Energy Efficient, Non-Silicon (non-Si) Digital Signal Processor (DSP) that can be integrated on the same die as an already demonstrated superconductive or photonic ultra-wide analog to digital converter (ADC) and used to adaptively thin the data stream produced as to signal band of interest, direction of signal arrival, or transmit the data to the user only if the signals characteristics match a fully specified set of signal parameters. Such processing must be accomplished in real time with less latency and power consumption than if done using commercial off the shelf (COTS) Si digital processors such as field-programmable gate array (FPGA).	LM Space Systems LM Space Systems - SMD	Jesus Isarraras Jeff Bowers	jesus.isarraras@lmco.com jeff.bowers@lmco.com
View Online	N17A-T028	Automatic Detection of Hydrothermal Vents	To develop and demonstrate an automatic sensor system for detection and discrimination of undersea hydrothermal vents from an unmanned surface vehicle (USV) or unmanned undersea vehicle (UUV).	LM Missiles and Fire Control (MFC) LM Rotary and Mission Systems, C4 & Undersea Systems (RMS C4USS)	John Fontana Michael Weingarten	john.c.fontana@lmco.com michael.weingarten@lmco.com
View Online	N17A-T029	Multi-vehicle Collaboration with Minimal Communications and Minimal Energy	To develop integrated multi-vehicle planning and autonomous control algorithms that can be used to balance energy efficiency and mission tasks. These software tools intended for multi-vehicle collaboration compatible with open architectures that adapt to environments in which energy efficiency is of significant importance and communications may be intermittent, low bandwidth, short range, and/or noisy	LM Missiles and Fire Control (MFC) LM Rotary and Mission Systems, C4 & Undersea Systems (RMS C4USS) LM Space Systems - SMD	John Fontana Michael Weingarten Jeff Bowers	john.c.fontana@lmco.com michael.weingarten@lmco.com jeff.bowers@lmco.com

View Online	N17A-T030	Advanced Laser Based Processing System for Metal Additive Manufacturing	Develop a laser based system with adaptive beam shaping control to be used as part of a metal Additive Manufacturing (AM) powder bed processing unit. The goal is to gain control over the spatiotemporal distribution of the laser power over the surface of the powder bed, instead of the current method of melting a single point on the powder bed and rastering it around the part contour. By having control of the spatiotemporal distribution of the laser power over the surface of the powder bed, better thermal energy flow characteristics and microstructure will be achieved while reducing residual stresses and defects.	LM Aeronautics (Aero) LM Space Systems LM Missiles and Fire Control (MFC) LM Rotary and Mission Systems, C4 & Undersea Systems (RMS C4USS)	Craig Owens Jesus Isarraras John Fontana Michael Weingarten	craig.l.owens@lmco.com jesus.isarraras@lmco.com john.c.fontana@lmco.com michael.weingarten@lmco.com
View Online	AF17A-T001	Fast Response Heat Flux Sensors and Efficient Data Reduction Methodology for Hypersonic Wind Tunnels	Develop robust sensors and an efficient data reduction methodology to obtain temporally and spatially resolved surface temperature and heat flux measurements on test articles in blowdown and continuous hypersonic wind tunnels.	LM Space Systems LM Missiles and Fire Control (MFC)	Jesus Isarraras John Fontana	jesus.isarraras@lmco.com john.c.fontana@lmco.com
View Online	AF17A-T002	Sensors for High Pressure and Temperature Hypersonic Testing Facilities	Design and develop temperature, pressure, and gas mixture composition measurement systems that will survive in harsh (2000 psi and 4000 °F) test facility flow environments.	LM Space Systems LM Missiles and Fire Control (MFC)	Jesus Isarraras John Fontana	jesus.isarraras@lmco.com john.c.fontana@lmco.com
View Online	AF17A-T003	Improved Calibration of Sensors and Instruments used for Measurement of High Speed Flow	Develop hardware, techniques, and standards required to improve the calibration of sensors used to measure high speed airflow.	LM Space Systems	Jesus Isarraras	jesus.isarraras@lmco.com
View Online	AF17A-T004	Physics-Based and Computationally Efficient Combustion Chemistry Modules with Acceptable Uncertainty for Air Force Relevant Hydrocarbon Fuels	Develop physically accurate and computationally efficient combustion chemistry modules, physics and pathway-centric kinetics models; validate and improve the models and quantum-chemistry computations; quantify and reduce the module's uncertainty.			
View Online	AF17A-T005	Alternative Methods for Creating a Sodium Guidestar	Demonstrate Vertical Cavity Surface Emitting Lasers as a possible source to excite mesospheric sodium at 589 nm and 1141 nm to provide cheaper, more useful, and more powerful cooperative sources for adaptive optics.	LM Missiles and Fire Control (MFC)	John Fontana	john.c.fontana@lmco.com
View Online	AF17A-T006	Three-sided Pyramid Wavefront Sensor	Pyramid Wavefront Sensor (PYWFS) is a highly sensitive sensor compared to the Shack-Hartmann wavefront sensor (SHWFS). We want to design and build a three-sided PYWFS as it is very difficult to build a four-sided PYWFS.	LM Space Systems LM Missiles and Fire Control (MFC)	Jesus Isarraras John Fontana	jesus.isarraras@lmco.com john.c.fontana@lmco.com
View Online	AF17A-T007	Automated 3D Reconstruction and Pose Estimation of Space Objects Using Ground Based Telescope Imagery	Using a series of ground captured satellite imagery, automatically perform image registration to previous passes and simulations. Construct a 3D reconstruction of a satellite evaluating identity, pose, and configuration in less than 15 minutes.			
View Online	AF17A-T008	Unified sensor for atmospheric turbulence and refractivity characterization	Develop and demonstrate a compact electro-optics system capable of in-situ characterization of atmospheric turbulence and refractivity along the path to a space- or ground-based target without using an adaptive optics system.	LM Space Systems	Jesus Isarraras	jesus.isarraras@lmco.com
View Online	AF17A-T009	Learner Engagement and Motivation to Learn Assessment and Monitoring System	Develop metrics and a system to persistently and unobtrusively assess and track learner engagement and motivation in and across learning situations and contexts.			
View Online	AF17A-T010	Flexible Broad-band Optical Device	Develop a flexible broad-band optical device capable of measuring optical properties.	LM Missiles and Fire Control (MFC)	John Fontana	john.c.fontana@lmco.com
View Online	AF17A-T011	Blended Reality Solution for Live, Virtual, and Constructive Field Training	Develop and evaluate learning utility of a rugged, lightweight system to provide high fidelity blended reality for outdoor ground-based Battlefield Airmen LVC training.	LM Missiles and Fire Control (MFC)	John Fontana	john.c.fontana@lmco.com
View Online	AF17A-T012	Development lightmap rendering technology to advance infrared simulation capabilities for training applications	Develop the capability to rapidly generate lightmap based models to enhance infrared capabilities in game engines/image generators to support C4ISR personnel training.			
View Online	AF17A-T013	Spectrum Localization for Improved Situational Awareness	Develop a scalable multi-channel, multi-band architecture and algorithms capable of supporting Spectrum localization for improved situational awareness.	LM Space Systems LM Missiles and Fire Control (MFC) LM Rotary and Mission Systems, Integrated Warfare Systems & Sensors (RMS IWSS)	Jesus Isarraras John Fontana Rebecca Gerskhovich	jesus.isarraras@lmco.com john.c.fontana@lmco.com rebecca.gershkovich@lmco.com
View Online	AF17A-T014	Reliable Aerothermodynamic Predictions for Hypersonic Flight for High Speed ISR	Develop a computational tool for analysis of laminar and turbulent hypersonic external flowfields in nonequilibrium to the required fidelity (high/low) for criteria driven by considerations of computational efficiency and reliability of prediction.	LM Space Systems LM Missiles and Fire Control (MFC) LM Space Systems - SMD	Jesus Isarraras John Fontana Jeff Bowers	jesus.isarraras@lmco.com john.c.fontana@lmco.com jeff.bowers@lmco.com
View Online	AF17A-T015	Design Analysis Methodology for Topology Optimization of Thermally Loaded Structures	Develop and demonstrate a methodology to optimize topologies of structures exposed to high thermal loads and other important loads for the design of novel lightweight aircraft embedded nozzles and engine aft decks.	LM Space Systems	Jesus Isarraras	jesus.isarraras@lmco.com
View Online	AF17A-T016	LWIR Thermal Imager for Combustion Process	Develop rugged, flexible, low-loss long-wave infrared (LWIR), fiber-based thermal imaging technology for analysis of combustion systems.	LM Missiles and Fire Control (MFC)	John Fontana	john.c.fontana@lmco.com
View Online	AF17A-T017	Methodology for Optimization of Bodies Subjected to Loads Produced by Chaotic Flows	Develop a methodology and software implementation to optimize body shape and internal structural size when exposed to unsteady loads produced by surrounding chaotic flows (i.e., turbulent and other highly unsteady flows).	LM Missiles and Fire Control (MFC)	John Fontana	john.c.fontana@lmco.com

View Online	AF17A-T018	Adaptive and Smart Materials for Advanced Manufacturing Methods	The objective of this effort is to identify new materials that are suitable for advanced manufacturing techniques, like 3D printing, that accommodate adaptive properties with respect to mechanical, geometrical, or electromagnetic properties.	LM Aeronautics (Aero) LM Missiles and Fire Control (MFC) LM Rotary and Mission Systems, C4 & Undersea Systems (RMS C4USS) LM Space Systems - SMD	Craig Owens John Fontana Michael Weingarten Jeff Bowers	craig.l.owens@lmco.com john.c.fontana@lmco.com michael.weingarten@lmco.com jeff.bowers@lmco.com
View Online	AF17A-T019	High Strain Composite Testing Methodologies	Develop detailed testing methodologies and procedures, enabling the fundamental understanding of high strain composite structural components for critical space strain energy driven deployable architectures.	LM Space Systems LM Missiles and Fire Control (MFC)	Jesus Isarraras John Fontana	jesus.isarraras@lmco.com john.c.fontana@lmco.com
View Online	AF17A-T020	Diagnostics for Multiphase Blast	Develop time-resolved test diagnostics to characterize particle and gas flow in multiphase blast.	LM Missiles and Fire Control (MFC)	John Fontana	john.c.fontana@lmco.com
View Online	AF17A-T021	High speed, multispectral, linear polarization display	Develop high speed, multispectral, linear polarization display capability, suitable for realistic stimulation of insect and crustacean optical systems.	LM Missiles and Fire Control (MFC)	John Fontana	john.c.fontana@lmco.com
View Online	AF17A-T022	Plasmonic Metamaterial Approach to Infrared Scene Projection	Develop emission control materials for infrared scene projection technology to provide a high contrast, high resolution, high apparent temperature, broad-band solution for infrared hardware-in-the-loop scene projection.	LM Missiles and Fire Control (MFC)	John Fontana	john.c.fontana@lmco.com
View Online	AF17A-T023	Practical Application of Molecular-Scale Modeling to Problems at the Grain Scale and Larger	Develop practical applications of molecular-scale modeling techniques to modeling problems at much larger length scales.			
View Online	AF17A-T024	III-Nitride Ternary Alloy Substrates for UV(A/B/C) and UWBG Development	Development of controlled, variable lattice constant Al(x)Ga(1-x)N substrates for device design flexibility in epitaxial thin films. High-quality ternary nitride substrates will enable the development of UV (A/B/C) lasers and power switching devices.	LM Rotary and Mission Systems, Cyber, Ships and Advanced Technologies (RMS CSAT) LM Missiles and Fire Control (MFC)	Gretchen Head John Fontana	gretchen.head@lmco.com john.c.fontana@lmco.com
View Online	AF17A-T025	Structural profile disruption effects for high-velocity air vehicles	Localized heating may produce profile disruptions in air vehicles at high enough velocities to affect either/both structural integrity and trajectory. The topic seeks to model the effects of such disruptions over a range of velocities and conditions.	LM Space Systems LM Missiles and Fire Control (MFC)	Jesus Isarraras John Fontana	jesus.isarraras@lmco.com john.c.fontana@lmco.com
View Online	AF17A-T026	Midwave Infared (MWIR) Quantum Cascade Lasers (QCL) Thermal Monitoring	Design, prototype fabrication, and testing of wide-aperture optical limiters with high laser-induced damage threshold and tunable limiting threshold. The protection from high-level laser radiation should be fast, broadband, and omnidirectional.			
View Online	AF17A-T027	Target Tracking via Deep Learning	Develop target tracking and reacquisition algorithms capable of learning and adapting to track high-value targets (HVT). Initial focus will be on electro-optical (EO) video with later extension to multiple intelligence (multi-INT) data sources.	LM Space Systems LM Missiles and Fire Control (MFC) LM Space Systems - SMD	Jesus Isarraras John Fontana Jeff Bowers	jesus.isarraras@lmco.com john.c.fontana@lmco.com jeff.bowers@lmco.com
View Online	AF17A-T028	Quantum Sensor for Direction Finding and Geolocation	Exploit the novel quantum electrodynamic properties from innovations in nanoelectronics, superconductors, meta-materials, and photonics to achieve a three-dimensional electromagnetic (EM) sensor for accurate vector sensing and geo-location of complex RF s	LM Missiles and Fire Control (MFC)	John Fontana	john.c.fontana@lmco.com
View Online	AF17A-T029	Fast Optical Limiters (OL) with Enhanced Dynamic Range	Design, prototype fabrication, and testing of wide-aperture optical limiters with high laser-induced damage threshold and tunable limiting threshold. The protection from high-level laser radiation should be fast, broadband, and omnidirectional.			
View Online	DHA17A-001	Medical Electro-Textile Sensor Simulation	The objective of this topic is to create a simulator to provide what-if scenarios to aid in developing smart combat uniform sensors and technology to record electromagnetic field activity of the war-fighter. The model will be developed for Joint use and is based on the e-textile work performed by the Services; in particular the Revolutionary Fibers and Textiles Institute located at the U.S. Armys Natick Soldier Research Development and Engineering Center (NSRDEC).	LM Missiles and Fire Control (MFC)	John Fontana	john.c.fontana@lmco.com
View Online	DHA17A-002	Smart Morphing Medical Moulage	To create advanced medical moulage technologies that can simulate an injury or pathology by morphing through a series of clinical states to provide stimulation of different senses to the trainee during a training scenario to confirm progression of the injury / pathology and/or to understand if iatrogenic errors or pathologies occurred due to treatment provided. As an example of a potential use case, a military medical specialist training for point-of-injury care might perform a lifesaving intervention and see the long-term impacts of that	LM Missiles and Fire Control (MFC)	John Fontana	john.c.fontana@lmco.com
View Online	DHA17A-003	Principled Design of an Augmented Reality Trainer for Medics	Design, prototype, and validate an augmented reality training system that provides deployed medics with refresher training on common, life-critical procedures of combat medicine.	LM Missiles and Fire Control (MFC)	John Fontana	john.c.fontana@lmco.com
View Online	DHA17A-004	Non-invasive Telemetric Assessment of Gut Microbiota Activity in Situ	Develop and validate an ingestible telemetric device for the non-invasive in vivo measurement of bacterial metabolite production within the human gastrointestinal (GI) tract.	LM Missiles and Fire Control (MFC)	John Fontana	john.c.fontana@lmco.com
View Online	DHA17A-005	Wireless Non-Invasive Advanced Control of Microprocessor Prostheses and Orthoses	Develop and demonstrate a non-invasive technology to wirelessly control a microprocessor prosthetic foot or hand, or upper or lower limb microprocessor controlled orthosis. The technology must be able to be used within a prosthetic socket and extend beyond the socket for patients who do not use a socket (e.g. osseointegration) and to harness proximal information (e.g. knee, thigh, and hip information for patients with transtibial amputation).	LM Missiles and Fire Control (MFC)	John Fontana	john.c.fontana@lmco.com
View Online	DHA17A-006	Medical Device to Assess the Viability of Tissue Prior to Skin Grafting	To develop, design, and demonstrate new technology that will allow surgeons to precisely, quickly, and objectively assess the viability of tissue in order to evaluate the effectiveness of the debridement (excision) of necrotic tissue prior to skin grafting.	LM Missiles and Fire Control (MFC)	John Fontana	john.c.fontana@lmco.com

View Online	SOCOM17-001	Family of Light Weight Cases for 5.56mm Ammunition	The objective of this topic is to develop an innovative Light weigh case meeting or exceeding the capabilities of the current brass cased ammunition while reducing the weight of the cartridge case by a minimum of 30% threshold with an objective of 40%. The case should have sufficient volume to allow use of currently available qualified 5.56mm propellants and achieve the required velocity of current 5.56mm ammunition without exceeding the stated chamber pressure for each ammunition sub type.	LM Missiles and Fire Control (MFC)	John Fontana	john.c.fontana@lmco.com
View Online	AF171-097	High temperature moisture sealants for hot exhuast structures on advanced system	Develop and demonstrate a high temperature moisture sealant to go over the ceramic coatings on existing turbine engine exhaust system ceramic of the advanced fleet. The coating and its application methods should be suitable for production, depot, and field repair.	LM Aeronautics (Aero)	Craig Owens	craig.l.owens@lmco.com
View Online	AF171-098	Quantification of microtexture regions in titanium alloys using optical sensing methods	Develop optical-based experimental methods that can rapidly and cost-effectively characterize the size and the anisotropic crystal orientation of the alpha-phase for titanium alloys, for features 0.05 millimeters in scale and larger.	LM Space Systems - SMD	Jeff Bowers	jeff.bowers@lmco.com
View Online	SOCOM17-002	Moisture Wicking Pathway Treatment for Textiles	Enhance drying time and garment comfort through enhanced moisture management in textiles being specific to the need of the material and use of the garment.			
View Online	SOCOM17-003	Innovative CubeSat Payloads for USSOCOM Space Missions	The objective of this topic is to develop innovative CubeSat payloads and technology that can support USSOCOM missions and/or advance CubeSat technology relevant to USSOCOM missions.	LM Space Systems LM Space Systems - SMD	Jesus Isarraras Jeff Bowers	jesus.isarraras@lmco.com jeff.bowers@lmco.com
View Online	SOCOM17-004	Big Data Network Forensics Analysis Tool Capability	The objective of this topic is to develop innovative capabilities to ingest large amounts of data from agents, sensors, and other data streams and rapidly analyze them in order to find the anomalies in support of defensive cyber operations.	LM Rotary and Mission Systems, Cyber, Ships and Advanced Technologies (RMS CSAT) LM Space Systems LM Missiles and Fire Control (MFC) LM Rotary and Mission Systems, Integrated Warfare Systems & Sensors (RMS IWSS)	Gretchen Head Jesus Isarraras John Fontana Rebecca Gerskhovich	gretchen.head@lmco.com jesus.isarraras@lmco.com john.c.fontana@lmco.com rebecca.gershkovich@lmco.com
View Online	DLA171-001	Increase Competition through Small Business Source Approval for Limited Source NSNs	Improve product availability and increase competition through the development of Small Business eligible manufacturing sources utilizing the DLAs Land and Maritime (L&M) Limited Source National Stock Number (NSN) List.			
View Online	DLA171-002	Reverse Engineering Technical Data Packages for Development of Alternate Sources of Supply for DLA NSNs	Improve product availability and increase competition through the performance of Reverse Engineering (RE) in the development of a technical data package to be submitted as a Source Approval Request (SAR). Small Business eligible manufacturing sources utilizing the DLAs Land and Maritime (L&M) Replenishment Parts Purchase or Borrow (RPPOB) Candidate List.	LM Rotary and Mission Systems, Integrated Warfare Systems & Sensors (RMS IWSS)	Rebecca Gerskhovich	rebecca.gershkovich@lmco.com
View Online	DHA17-001	Electro-Textile Medical Simulation	Develop a medical simulation to model the impacts to e-textiles that coincide with bodily injury. Once established, to use the e-textile impact to infer bodily damage. The model will be based on the e-textile work performed by the Services; in particular the Revolutionary Fibers and Textiles Institute located at US Armys Natick Soldier Research Development and Engineering Center (NSRDEC).	LM Missiles and Fire Control (MFC)	John Fontana	john.c.fontana@lmco.com
View Online	DHA17-002	Self-Healing Elastomer for Medical Simulation & Training	Develop lifelike synthetic self-healing material suitable for applications such as 3-D printing or continuous liquid interface production as examples for medical simulation physical trainer applications. It is desired that such simulated tissue enable self-sealing tissue such as vessels (e.g. veins, arteries, etc.) skin, or other simulated tissues/organs that may be punctured, cut (incision), and possibly even excised, to represent the simulation of wound closure and multiple additional uses.	LM Missiles and Fire Control (MFC)	John Fontana	john.c.fontana@lmco.com
View Online	DHA17-003	Dynamics for Warfighter Avatars with Complete Articulated Anatomy	Design, develop and demonstrate computer software and data structures for adding articulated joints and natural motions to the US Army Research Institute of Environmental Medicine (USARIEM) avatars and create a graphical user interface for planning and activating avatar physical movement. Complete anatomy avatars have a broad future role in advanced training environments providing, for example, medically correct immersive experiences, performance-related physiological modeling studies, and in simulations for the purpose of designing protective armor.	LM Missiles and Fire Control (MFC)	John Fontana	john.c.fontana@lmco.com
View Online	DHA17-004	A Device to Rapidly Detect Coliform Bacteria and Escherichia Coli in Field Water Samples	Develop a field-portable device to rapidly detect viable coliform bacteria and Escherichia coli (E. coli) in water samples.			

View Online	DHA17-005	Compression Garment with Embedded Electronics for Ambulatory Health and Performance Monitoring	Develop and demonstrate a functional compression shirt with embedded electronics capable of physiological monitoring. The prototype e-garment should be both comfortable for the user as well as capable of collecting, storing and wirelessly transmitting acquired data with minimal distortion. This system will provide physiological health and performance state information allowing for improved safety and sustained work capacity. The focus of this topic is primarily on the integration necessary to exploit extant and emerging state of the art ultra-low power electronics and other government furnished technologies to produce a functional physiological monitoring system.	LM Missiles and Fire Control (MFC)	John Fontana	john.c.fontana@lmco.com
View Online	DHA17-006	Development of Thermal Desorption (TD) Tube Sequential Sampler	Develop a thermal desorption (TD) tube sequential sampler to aid in accomplishing comprehensive air sampling on predetermined or automatically initiated timelines to improve the identification of contaminant concentrations at a certain point of time.			
View Online	DHA17-007	Noninvasive Monitor of Vascular Volume Fluid Shifts	The envisioned monitor is a working device that quantifies serial/continuous measurements of vascular volume components to detect shifts of 2% in less than 1 hour.			
View Online	DHA17-008	Self-Aligning Prosthetic Components	Develop and demonstrate an automatic alignment tool for a prosthetic leg. This tool will generate objective measures to determine optimal alignment of the prosthesis and will provide real time feedback to the care provider and patient.			
View Online	DHA17-009	Conformable Osteochondral Repair Platforms for Prevention of Post Traumatic Osteoarthritis	Develop an osteochondral repair platform that is conformable to a wide variety of injury geometries without the need for pre-operative customization, that does not rely on any autologous tissue, and that is amenable to scalable manufacturing methods.	LM Missiles and Fire Control (MFC)	John Fontana	john.c.fontana@lmco.com
View Online	DHA17-010	Point of Injury Device to Maintain and Stabilize Moderate-Severe Traumatic Brain Injury (TBI) Casualties	Development of a novel device for the stabilization of moderate to severe brain injury at point of injury/point of need that can be used by first responders in the deployed environment (medics and corpsmen).	LM Missiles and Fire Control (MFC)	John Fontana	john.c.fontana@lmco.com
View Online	DHA17-011	Point of Injury Therapy to Maintain and Stabilize Moderate-Severe Traumatic Brain Injury (TBI) Casualties.	Development of a novel treatment for the stabilization of moderate to severe brain injury at point of injury/point of need that can be used by first responders in the deployed environment (medics and corpsmen).	LM Missiles and Fire Control (MFC)	John Fontana	john.c.fontana@lmco.com
View Online	SB171-001	New Platforms for High-Throughput Culturing and Analysis of Microbial Communities	Develop and demonstrate novel, high yield, and high throughput multiplexed platforms for culturing and analysis of microbes from microbial communities.			
View Online	SB171-002	Automated Environmental and Biological Threat Identification System	Develop a handheld platform for real-time identification of a wide range of insect, plant, and reptile (e.g., snake) species that may be found in DoD areas of operation.	LM Missiles and Fire Control (MFC)	John Fontana	john.c.fontana@lmco.com
View Online	SB171-003	New Platform Technologies for Viral and Therapeutic Evolution Assays	Design and develop new bioreactor technology suitable for long-term assays of cellular and viral evolutionary dynamics, emulating human-like continuous conditions. Demonstrate and validate the technology in a relevant application.			
View Online	SB171-004	Applying Novel Materials and Fabrication Techniques to Thermionic Energy Conversion	Develop efficient, power-dense thermionic materials and device structures that leverage recent advances in novel device design, novel cathode and anode materials, and recent advances in semiconductor physics. Apply these advances to thermionic converters, improving their performance in terms of power densities (>10 W/cm2), conversion efficiencies (>25%), and lifetimes (>5 years).	LM Rotary and Mission Systems, Cyber, Ships and Advanced Technologies (RMS CSAT) LM Space Systems - SMD	Gretchen Head Jeff Bowers	gretchen.head@lmco.com jeff.bowers@lmco.com
View Online	SB171-005	Discovery	Develop transformative knowledge navigation and document discovery software with the ability to analyze complex, multi-faceted data sets and provide the user with an intuitive interface that shows patterns and connections within the data regardless of data size or file type.	LM Space Systems LM Rotary and Mission Systems, Integrated Warfare Systems & Sensors (RMS IWSS)	Jesus Isarraras Rebecca Gerskhovich	jesus.isarraras@lmco.com rebecca.gershkovich@lmco.com
View Online	SB171-007	Modeling Human Dimensions of the Cyber Ecosystem	Represent and analyze human behaviors within a cyber ecosystem (consisting of software, hardware, and human users) to support assessment of overall ecosystem security.	LM Missiles and Fire Control (MFC)	John Fontana	john.c.fontana@lmco.com
View Online	SB171-008	Harnessing Open-Source Signals for Detection of Systematic Intervention in Online Discourse	Develop a generalizable approach and enabling software for detecting and analyzing systematic interventions in online discourse.	LM Missiles and Fire Control (MFC)	John Fontana	john.c.fontana@lmco.com
View Online	SB171-009	Force Protection in the Online Information Environment	Develop automated software tools that use publicly available information (PAI) to detect intent, within foreign populations, to harm U.S. forces stationed overseas, while ensuring privacy and appropriately addressing personally identifiable information that may be found in PAI.			
View Online	SB171-010	Ultra-Compact Power Conditioning System for High Power RF Transmitters	Design and demonstrate an innovative high voltage power supply/modulator utilizing novel components and/or topologies to significantly reduce the size and weight of high power RF transmitters based on vacuum electronics.	LM Rotary and Mission Systems, Integrated Warfare Systems & Sensors (RMS IWSS)	Rebecca Gerskhovich	rebecca.gershkovich@lmco.com
View Online	SB171-011	Recommender Systems for Streaming Data Environments	Develop innovative approaches that enable recommender systems to take advantage of domains where the set of available features changes over time.	LM Rotary and Mission Systems, Integrated Warfare Systems & Sensors (RMS IWSS)	Rebecca Gerskhovich	rebecca.gershkovich@lmco.com

View Online	SB171-012	Non-linear Adaptive Optics	Develop adaptive optics (AO) for beam control of high energy ultra-short pulse lasers (USPLs) propagating through non-linear media.	LM Space Systems LM Missiles and Fire Control (MFC) LM Space Systems - SMD	Jesus Isarraras John Fontana Jeff Bowers	jesus.isarraras@lmco.com john.c.fontana@lmco.com jeff.bowers@lmco.com
View Online	SB171-013	Load Bearing Thermal Protection Structure for Hypersonic Flight	Develop and demonstrate lightweight, low-cost, load-bearing thermal protection structure for hypersonic flight.	LM Aeronautics (Aero) LM Missiles and Fire Control (MFC) LM Space Systems - SMD	Craig Owens John Fontana Jeff Bowers	craig.l.owens@lmco.com john.c.fontana@lmco.com jeff.bowers@lmco.com
View Online	SB171-014	Adaptive Control and Advanced Sensing for Turbine Based Combined Cycle Vehicles	Develop an adaptive control system for high-speed propulsion systems that leverages self-learning and distributed sensors on board and integrates them into the vehicle and propulsion systems.	LM Space Systems - SMD	Jeff Bowers	jeff.bowers@lmco.com
View Online	SB171-015	Spacecraft Identification Device	Develop a radio frequency identification (RFID) or other extremely low-power device that can be integrated into spacecraft or other space objects (e.g., rocket stages) without any direct power or data connection to the host, and provides a unique identification code along with information about the position and state of health of the host platform.	LM Space Systems - SMD	Jeff Bowers	jeff.bowers@lmco.com
View Online	SB171-006	Code Interposition Framework for Mobile Cyber Applications	Design and implement a framework for code interposition on mobile application code based on known functional code blocks and Application Programming Interfaces (APIs).	LM Missiles and Fire Control (MFC)	John Fontana	john.c.fontana@lmco.com
View Online	CBD171-001	Development of Solid-state Optical Cooler Materials to Replace Conventional Cryocoolers Used for Cooling SWIR and LWIR Infrared Detectors and Focal-plane-arrays	To develop efficient Infrared (IR) fluorescent materials for laser/optical cooling to cryogenic temperatures. The materials will serve as cooling agents in the development of all solid-state cryogenic coolers with no moving parts. The goal is to replace current mechanical closed cycle and thermoelectric coolers used in cooling Short Wavelength IR (SWIR) and Long Wavelength IR (LWIR) infrared detectors/Focal-Plane Arrays (FPA). This development will provide remote, lightweight, vibration free cooling and hence more reliable operation of infrared sensor systems designed for surveillance.	LM Rotary and Mission Systems, Cyber, Ships and Advanced Technologies (RMS CSAT) LM Space Systems - SMD	Gretchen Head Jeff Bowers	gretchen.head@lmco.com jeff.bowers@lmco.com
View Online	CBD171-002	MicroLens Hyperspectral Imager for Standoff Chemical Detection	Develop a small lightweight lenslet-based hyperspectral imaging sensor for detection and identification of chemical agents and toxic industrial chemicals	LM Rotary and Mission Systems, Cyber, Ships and Advanced Technologies (RMS CSAT) LM Space Systems LM Missiles and Fire Control (MFC) LM Space Systems - SMD	Gretchen Head Jesus Isarraras John Fontana Jeff Bowers	gretchen.head@lmco.com jesus.isarraras@lmco.com john.c.fontana@lmco.com jeff.bowers@lmco.com
View Online	CBD171-003	Tomographic Nanoscopy for Pathogen Identification	Develop an optical method for the determination of cellular structure and function in possible pathogen organisms	LM Missiles and Fire Control (MFC)	John Fontana	john.c.fontana@lmco.com
View Online	CBD171-004	Open-Path Optical Analyzer for Quantitative Chemical Weapons Detection	Develop inexpensive dynamic, real time analytical technology for multicomponent vapor identification and quantification.	LM Missiles and Fire Control (MFC)	John Fontana	john.c.fontana@lmco.com
View Online	CBD171-005	Process Development and Manufacture of an Antibody-based Therapy Against Sudan ebolavirus	Develop an optical method for the determination of cellular structure and function in possible pathogen organisms	LM Missiles and Fire Control (MFC)	John Fontana	john.c.fontana@lmco.com
View Online	N171-D01	Direct to Phase II - Unsteady Flow Analysis on Inlet and Exhaust System Distortion and Structural Analysis for Modern Propulsion Systems	Develop high fidelity fluid/structural interaction computer model suitable for performing multidisciplinary analysis of engine inlet and exhaust systems found in modern and future air vehicles.			
View Online	N171-001	Beyond Line of Sight (BLOS) High Data Rate Communications	Develop high data rate Beyond Line of Sight ship to shore communications. The system must be man portable for use in tactical environments.	LM Missiles and Fire Control (MFC) LM Rotary and Mission Systems, C4 & Undersea Systems (RMS C4USS) LM Rotary and Mission Systems, Integrated Warfare Systems & Sensors (RMS IWSS) LM Space Systems - SMD	John Fontana Michael Weingarten Rebecca Gerskhovich Jeff Bowers	john.c.fontana@lmco.com michael.weingarten@lmco.com rebecca.gershkovich@lmco.com jeff.bowers@lmco.com
View Online	N171-002	Intranasal Cooling for Encephalopathy Prevention (ICEP)	Develop a field ruggedized medical device for providing nasopharyngeal cooling of the brain for the prevention and mitigation of intracranial edema in traumatic brain injuries (TBI).			
View Online	N171-003	Driver Performance Monitoring through Electronic Trip Tickets	Develop and field a Driver Performance Monitoring capability where vehicle and driver performance data is collected, stored, and analyzed locally at the unit in an open XML format that can be queried and filtered using a simple point and click interface by the Motor Transport Officer or Commander. Indicators of deficient performance would lead to focused remediation to improve skills in a driver simulator. The objective capability would be to feed data gathered at the unit level to Training and Education Command (TECOM)s Marine Corps Training Information Management System (MCTIMS) and to Marine Corps Logistics Command (LOGCOM) databases for condition based maintenance.	LM Missiles and Fire Control (MFC) LM Rotary and Mission Systems, C4 & Undersea Systems (RMS C4USS)	John Fontana Michael Weingarten	john.c.fontana@lmco.com michael.weingarten@lmco.com
View Online	N171-004	Collapsible Electronic Paper Display	Develop Electronic Paper Technology to provide a laptop accessory, specifically a portable, flexible, external electronic Display Screen that can be used by individual Marine Maintainers to view schematic diagrams, drawings, and pictures at the point of maintenance. Ideally, this device provides the same level of integration as any commercial off the shelf (COTS) computer display screen; requiring minimal software drivers, and hardware connections limited to power and commonly used Personal Computer and or Audio Video interface standards (DVI-D, DVI-I, HDMI, Display Port, S-video, USB, etc). This Display will be connected to the Electronic Maintenance Support System (EMSS) to provide a large clear full view of detailed schematics, drawings and pictures contained in Technical publications.	LM Rotary and Mission Systems, C4 & Undersea Systems (RMS C4USS) LM Rotary and Mission Systems, Integrated Warfare Systems & Sensors (RMS IWSS)	Michael Weingarten Rebecca Gerskhovich	michael.weingarten@lmco.com rebecca.gershkovich@lmco.com

View Online	N171-005	Deep Learning for Clutter Reduction in Multi-static Coherent Active Sonar Systems	Develop and adapt deep learning algorithms to multi-static active sonar (specifically Multi-static Active Coherent (MAC)) to improve automated signal and information processing as well as target detection and discrimination capabilities.	LM Missiles and Fire Control (MFC) LM Rotary and Mission Systems, C4 & Undersea Systems (RMS C4USS) LM Rotary and Mission Systems, Integrated Warfare Systems & Sensors (RMS IWSS)	John Fontana Michael Weingarten Rebecca Gerskhovich	john.c.fontana@lmco.com michael.weingarten@lmco.com rebecca.gershkovich@lmco.com
View Online	N171-006	Guided Rocket Inductive Link	Provide rockets with a method for programming fuze settings, providing targeting data, and a compliant arming environment for fuzing.	LM Missiles and Fire Control (MFC) LM Space Systems - SMD	John Fontana Jeff Bowers	john.c.fontana@lmco.com jeff.bowers@lmco.com
View Online	N171-007	Oxygen Mask Development to Improve and Facilitate Mask Discipline	Develop solution to improve mask discipline and improve oxygen mask comfort.			
View Online	N171-008	Novel Ventilating Fabric Dry Suit Technology	Develop a fabric or fabric technology for a dry suit that allows sufficient air exchange for evaporative cooling of the wearers skin, but that passively and immediately reaches and holds a watertight state.			
View Online	N171-009	Rugged Touchscreen Button with Positive Indication Feedback	Develop a rugged touchscreen which can be reconfigured into a physical button that can be seen and/or felt, is capable of providing tactile, haptic, or some other method of positive indication feedback to a user and is capable of surviving the harsh environment on a US Navy Aircraft Carrier Flight Deck.			
View Online	N171-010	Additive Manufacturing Technology for Sonobuoy Applications	Demonstrate the capabilities and benefits of applying state of the art additive manufacturing (AM) for sonobuoy components by developing novel production methods and utilizing emergent materials technology with the intention to reduce production costs, maintain current reliability specifications, and obtain equivalent or improved performance when compared to current production sonobuoy components.	LM Missiles and Fire Control (MFC) LM Rotary and Mission Systems, C4 & Undersea Systems (RMS C4USS)	John Fontana Michael Weingarten	john.c.fontana@lmco.com michael.weingarten@lmco.com
View Online	N171-011	Advanced Arresting Gear Water Twister Diagnostics and Health Monitoring	Develop a man portable diagnostics tool, (MPDT) capable of giving diagnostics and health information concerning the Advance Arresting Gear (AAG) Water Twister.	LM Missiles and Fire Control (MFC)	John Fontana	john.c.fontana@lmco.com
View Online	N171-012	Transition of Mission Planning Software to a Next Generation Component Based, Open Architecture using Advanced Refactoring Technology	Develop an advanced software refactoring algorithm, using artificial intelligence (AI) technology or other similar innovative development approach, to facilitate transition of legacy mission planning software to a capabilities based, open architecture, next generation mission planning software suite. The resulting components must generate all required planning and initialization data for uploading to multiple disparate platforms, both manned and unmanned.	LM Rotary and Mission Systems, Cyber, Ships and Advanced Technologies (RMS CSAT) LM Rotary and Mission Systems, Integrated Warfare Systems & Sensors (RMS IWSS) LM Space Systems - SMD	Gretchen Head Rebecca Gerskhovich Jeff Bowers	gretchen.head@lmco.com rebecca.gershkovich@lmco.com jeff.bowers@lmco.com
View Online	N171-013	Photonic Switch for Laser Power Distribution	Develop an innovative, stand-alone switch for distribution from a central source of laser power to multiple outputs using photonic switch technologies with one input and N outputs.	LM Rotary and Mission Systems, Cyber, Ships and Advanced Technologies (RMS CSAT)	Gretchen Head	gretchen.head@lmco.com
View Online	N171-014	Advanced Human-Machine Interface (HMI) for Dynamic Sensor Control	Develop an innovative advanced human-machine interface (HMI) for a dynamic sensor suite control system that exploits all available platform data in real-time to reduce operator workload and provide timely actionable information.	LM Rotary and Mission Systems, Cyber, Ships and Advanced Technologies (RMS CSAT) LM Rotary and Mission Systems, Integrated Warfare Systems & Sensors (RMS IWSS)	Gretchen Head Rebecca Gerskhovich	gretchen.head@lmco.com rebecca.gershkovich@lmco.com
View Online	N171-015	Fiber Optic Ferrule with Internal Stepped Cavity	Develop a low cost, reliable advanced fiber optic ferrule material and fabrication technology able to self-align the core of the optical fiber with the center of a lens, each with different outer diameters.			
View Online	N171-016	Modular Multi-Platform Rotor Hub Fatigue Test Rig	Develop a modular system that can be configured to fatigue test a variety of main rotor hub and shaft assemblies with minimal fixture components unique to each assembly.			
View Online	N171-017	Compact, Broadband, Efficient and High Power Transmit Antenna for Airborne Electronic Attack Platforms	Create an Airborne Electronic Attack (AEA) antenna capable of operating simultaneously at very high frequency (VHF) and ultra-high frequency (UHF) while being electrically-small, efficient, and capable of high power handling.	LM Rotary and Mission Systems, Cyber, Ships and Advanced Technologies (RMS CSAT) LM Missiles and Fire Control (MFC) LM Rotary and Mission Systems, Integrated Warfare Systems & Sensors (RMS IWSS)	Gretchen Head John Fontana Rebecca Gerskhovich	gretchen.head@lmco.com john.c.fontana@lmco.com rebecca.gershkovich@lmco.com
View Online	N171-018	In-Flight Bladder Relief	Develop a low cost solution to provide aircrew with the capability of bladder relief during flight.	LM Missiles and Fire Control (MFC)	John Fontana	john.c.fontana@lmco.com
View Online	N171-019	Enhanced Long Range Line-up System (E-LRLS)	Develop an Enhanced Long Range Line-up System (E-LRLS) which can meet/exceed the current LRLS range performance requirements with significant reductions in form factor and weight.			
View Online	N171-020	Day, Night, and Night Vision Display Compatible Horizon Reference System	Develop a Horizon Reference System for air capable ships that can be operated during both day and night, is compatible with Night Vision Imaging System (NVIS) devices and is minimally intrusive on ships structure.	LM Rotary and Mission Systems, Cyber, Ships and Advanced Technologies (RMS CSAT) LM Missiles and Fire Control (MFC) LM Rotary and Mission Systems, Integrated Warfare Systems & Sensors (RMS IWSS)	Gretchen Head John Fontana Rebecca Gerskhovich	gretchen.head@lmco.com john.c.fontana@lmco.com rebecca.gershkovich@lmco.com
View Online	N171-021	Effectiveness Assessments of Mixed & Immersive Reality for Aviation Training	Develop a methodology and tool that results in a capability to investigate the training effectiveness, comparable utility, and return on investment of an augmented reality solution for applied aviation training tasks.	LM Missiles and Fire Control (MFC)	John Fontana	john.c.fontana@lmco.com
View Online	N171-022	Novel High Energy Density Fuels Development	Synthesize a novel liquid hydrocarbon fuel or fuel blend that has a higher volumetric energy density than JP-10 and is less susceptible to thermal and oxidative degradation.			
View Online	N171-023	Computer Network Defense Trainer	Design and develop emulations of common cyber threats that can be safely and securely deployed on operational networks and systems to train battle staffs and computer network defense personnel to succeed in contested cyberspace environments.	LM Rotary and Mission Systems, Cyber, Ships and Advanced Technologies (RMS CSAT) LM Rotary and Mission Systems, Integrated Warfare Systems & Sensors (RMS IWSS)	Gretchen Head Rebecca Gerskhovich	gretchen.head@lmco.com rebecca.gershkovich@lmco.com
View Online	N171-024	Processing and Fabrication Method to Enhance the Mechanical Performance and Extend the Overall Service Life of Arresting Gear Purchase Cable Wire	Develop a processing and fabrication method to enhance the mechanical performance and extend the overall service life of arresting gear purchase cable wire through incorporation by homogeneous dispersion of reinforcing micro- and nano-particles in the base steel material.	LM Missiles and Fire Control (MFC)	John Fontana	john.c.fontana@lmco.com

View Online	N171-025	Software Tool for Statistical Radar Signature Description of Small Sea Targets	Develop a software tool capable of performing a rigorous statistical analysis to accurately predict high-resolution radar signatures of small sea targets.	LM Rotary and Mission Systems, Cyber, Ships and Advanced Technologies (RMS CSAT) LM Missiles and Fire Control (MFC) LM Rotary and Mission Systems, C4 & Undersea Systems (RMS C4USS) LM Rotary and Mission Systems, Integrated Warfare Systems & Sensors (RMS IWSS)	Gretchen Head John Fontana Michael Weingarten Rebecca Gerskhovich	gretchen.head@lmco.com john.c.fontana@lmco.com michael.weingarten@lmco.com rebecca.gershkovich@lmco.com
View Online	N171-026	Aircrew-Mounted Self-Adjusting Tether System	Develop an aircrew-mounted mobile auto-retracting restraint system for use in rotary wing aircraft.	LM Rotary and Mission Systems, C4 & Undersea Systems (RMS C4USS)	Michael Weingarten	michael.weingarten@lmco.com
View Online	N171-027	Innovative Approach to Full Scale Fatigue Testing using Hybrid Methodologies	Develop a test methodology and testing system to conduct structural testing on helicopter airframes that combines low frequency loads (maneuver, inertial or ground) with high frequency vibratory loads (buffet, rotor dynamics) in order to properly assess aircraft structures for durability.	LM Space Systems - SMD	Jeff Bowers	jeff.bowers@lmco.com
View Online	N171-028	Lightweight Self-Start System for T56 Engine Driven Aircraft	Identify and develop small, self-contained, lightweight system for starting E-2D T56 engines and allow for remote field operations.			
View Online	N171-029	Accurate Sensing of Low Speed Vehicle Motion Relative to a Moving Platform	Develop a sensor(s) that accurately senses the relative motion between a slow moving unmanned vehicle and the deck of a ship.	LM Missiles and Fire Control (MFC) LM Rotary and Mission Systems, C4 & Undersea Systems (RMS C4USS) LM Rotary and Mission Systems, Integrated Warfare Systems & Sensors (RMS IWSS)	John Fontana Michael Weingarten Rebecca Gerskhovich	john.c.fontana@lmco.com michael.weingarten@lmco.com rebecca.gershkovich@lmco.com
View Online	N171-030	Dual Chaff Air Expendable Decoy Device	Design and develop a dual chaff air expendable decoy device consisting of a dual impulse cartridge and a payload casing system. No development is required for the chaff payload itself.	LM Rotary and Mission Systems, C4 & Undersea Systems (RMS C4USS)	Michael Weingarten	michael.weingarten@lmco.com
View Online	N171-031	1 Micron Fiber Optic Receiver for Mil-Aero Environment	Develop and package single-mode fiber pigtailed high-power photodiodes, operating at 1 micron wavelength, for wideband Radio Frequency (RF) photonics receiver applications.	LM Rotary and Mission Systems, Integrated Warfare Systems & Sensors (RMS IWSS) LM Space Systems - SMD	Rebecca Gerskhovich Jeff Bowers	rebecca.gershkovich@lmco.com jeff.bowers@lmco.com
View Online	N171-032	Built-In Test Capable Aircraft Sensor and Stores Fiber Optic Interface	Develop an aircraft/rotorcraft fuselage, wingtip, pylon and/or pod compatible multichannel fiber optic interface for use in future generation analog/RF-over-Fiber (radio frequency) and digital multiplexed communication and electronic warfare systems.	LM Rotary and Mission Systems, Integrated Warfare Systems & Sensors (RMS IWSS)	Rebecca Gerskhovich	rebecca.gershkovich@lmco.com
View Online	AF171-096	Improved Casting Quality through Novel Engineered Ceramic Molten Metal Filters Improved Casting Quality through Additively Manufactured Ceramic Molten Metal Filters	Incentivize small businesses to utilize advances in ceramic manufacturing, including, but not limited to, additive manufacturing, to develop new and/or improved ceramic filters used in metal casting processes leading to significantly cleaner and less porous castings	LM Missiles and Fire Control (MFC) LM Rotary and Mission Systems, C4 & Undersea Systems (RMS C4USS)	John Fontana Michael Weingarten	john.c.fontana@lmco.com michael.weingarten@lmco.com
View Online	N171-033	Novel Dry Suit Sock Joining Technology	Develop user-installable watertight joint for dry suit socks to enable organizational (O-Level) place-in-service of aircrew anti-exposure assemblies.			
View Online	N171-034	Time-Resolved, Reynolds-Average Navier Stokes (RANS) / Large Eddy Simulation (LES) Flow-Modeling Tools Suitable for Gas Turbine Engine Sand and Dust Modeling	Develop reactive solid modeling tools or routines that enable Reynolds-Average Navier Stokes (RANS) / Large Eddy Simulation (LES) Computational Fluid Dynamics (CFD) tools to perform time resolved modeling for passage of solid particles of reactive sand and dust through the flow path of gas turbine engines. Predict time varying sand and dust material properties, concentrations, phase, and structural impact phenomena at key locations through the engine.			
View Online	N171-035	Gamification for Combat System Employment	Develop a Gamification training architecture for the current Learning Management System (LMS) that leverages gamification strategies and techniques for ASW personnel training at sea.	LM Rotary and Mission Systems, Integrated Warfare Systems & Sensors (RMS IWSS)	Rebecca Gerskhovich	rebecca.gershkovich@lmco.com
View Online	N171-036	Damage Visualization of Submersible Navy Composites	Develop an innovative, affordable visual approach capable of identifying damage in submersible non-pressure hull composite structures.	LM Rotary and Mission Systems, Cyber, Ships and Advanced Technologies (RMS CSAT) LM Missiles and Fire Control (MFC) LM Rotary and Mission Systems, C4 & Undersea Systems (RMS C4USS)	Gretchen Head John Fontana Michael Weingarten	gretchen.head@lmco.com john.c.fontana@lmco.com michael.weingarten@lmco.com
View Online	N171-037	Improved Magazine/Armor for Ballistic Performance	Develop innovative mechanical surface treatments for armor systems to improve the ballistic performance of the LCS magazine storage structure to provide an overall weight savings for the ship.	LM Rotary and Mission Systems, Cyber, Ships and Advanced Technologies (RMS CSAT) LM Missiles and Fire Control (MFC)	Gretchen Head John Fontana	gretchen.head@lmco.com john.c.fontana@lmco.com
View Online	N171-038	Diffractive Optical Element for Light Field Displays (LFDs)	Develop a diffractive optical element for light field displays that replaces micro-lens arrays in light field display projection systems.	LM Space Systems LM Missiles and Fire Control (MFC) LM Rotary and Mission Systems, C4 & Undersea Systems (RMS C4USS) LM Space Systems - SMD	Jesus Isarraras John Fontana Michael Weingarten Jeff Bowers	jesus.isarraras@lmco.com john.c.fontana@lmco.com michael.weingarten@lmco.com jeff.bowers@lmco.com
View Online	N171-039	SUBSAFE Hull Penetrator for Submarine High Energy Laser (HEL)	Develop innovative Subsafe hull penetrator technology to connect HEL weapon system subcomponents through a submarine pressure hull to facilitate the inboard/outboard integration of a HEL weapon system on VIRGINIA Class submarines.	LM Space Systems - SMD	Jeff Bowers	jeff.bowers@lmco.com
View Online	N171-040	Dual Authentication for Navy Tactical Systems	Develop affordable, seamless two-factor authentication for the Submarine Warfare Federated Tactical System (SWFTS).	LM Rotary and Mission Systems, Integrated Warfare Systems & Sensors (RMS IWSS)	Rebecca Gerskhovich	rebecca.gershkovich@lmco.com
View Online	N171-041	Graphics Scene Description and Application Interface for Heterogeneous 3D Display Environments	Develop a common Field of Light Display (FoLD) interface that allows for the integration of multi-view displays into AEGIS Display Systems.	LM Rotary and Mission Systems, C4 & Undersea Systems (RMS C4USS) LM Rotary and Mission Systems, Integrated Warfare Systems & Sensors (RMS IWSS)	Michael Weingarten Rebecca Gerskhovich	michael.weingarten@lmco.com rebecca.gershkovich@lmco.com
View Online	N171-042	Improved Skirt System for Air Cushion Vehicles	Develop an Improved Skirt System to increase the skirt material life, decrease maintenance time and decrease total ownership costs, while maintaining performance of the current LCAC Deep Skirt System and the SSC Advanced Skirt System.			
View Online	N171-043	Solid State Radar Emitter Identification	Develop Solid State Radar Emitter Identification algorithms to detect, classify, and uniquely identify solid-state radar emitters in real time. This topic, if successful, will allow modern Electronic Warfare (EW) systems that utilize richer digital data products to accurately detect, classify, and localize these changing and complex emitters.	LM Rotary and Mission Systems, Cyber, Ships and Advanced Technologies (RMS CSAT) LM Missiles and Fire Control (MFC) LM Rotary and Mission Systems, Integrated Warfare Systems & Sensors (RMS IWSS) LM Space Systems - SMD	Gretchen Head John Fontana Rebecca Gerskhovich Jeff Bowers	gretchen.head@lmco.com john.c.fontana@lmco.com rebecca.gershkovich@lmco.com jeff.bowers@lmco.com

View Online	N171-044	Cognitive Software Algorithms Techniques for Electronic Warfare	Develop innovative cognitive software algorithms and techniques for electronic warfare in order to counter highly agile radar emitters.	LM Rotary and Mission Systems, Cyber, Ships and Advanced Technologies (RMS CSAT) LM Missiles and Fire Control (MFC) LM Rotary and Mission Systems, Integrated Warfare Systems & Sensors (RMS IWSS) LM Space Systems - SMD	Gretchen Head John Fontana Rebecca Gerskhovich Jeff Bowers	gretchen.head@lmco.com john.c.fontana@lmco.com rebecca.gershkovich@lmco.com jeff.bowers@lmco.com
View Online	N171-045	Random Anti-Reflective Hydrophobic Textures on Semi-Hemispheric Domes	Develop a process to apply Random Anti-Reflective (RAR) nano-textures to sapphire, spinel, and fused silica semi-hemispheric windows and domes, allowing for a reduction in sun glint.	LM Missiles and Fire Control (MFC)	John Fontana	john.c.fontana@lmco.com
View Online	N171-046	Long Term, Low Voltage Storage of High Power and Energy Dense Batteries	Develop a high power, energy dense storage battery capable of supporting pulse-type loads that can also be stored at low voltage (~0V) for extended periods.	LM Rotary and Mission Systems, Cyber, Ships and Advanced Technologies (RMS CSAT) LM Missiles and Fire Control (MFC) LM Rotary and Mission Systems, C4 & Undersea Systems (RMS C4USS) LM Space Systems - SMD	Gretchen Head John Fontana Michael Weingarten Jeff Bowers	gretchen.head@lmco.com john.c.fontana@lmco.com michael.weingarten@lmco.com jeff.bowers@lmco.com
View Online	N171-047	Advanced Minehunting Sonar Data Fusion	Develop a process to filter and fuse data from volume and side-scan active towed sonars to reduce false classifications and extract detection features for downstream Automatic Target Recognition (ATR) processing.	LM Rotary and Mission Systems, Cyber, Ships and Advanced Technologies (RMS CSAT) LM Rotary and Mission Systems, C4 & Undersea Systems (RMS C4USS)	Gretchen Head Michael Weingarten	gretchen.head@lmco.com michael.weingarten@lmco.com
View Online	N171-048	Fully Adaptive Active Sonar (FAAS)	Develop a closed-loop active adaptive sonar to improve detection, localization, and classification performance and reduce manning requirements.	LM Rotary and Mission Systems, C4 & Undersea Systems (RMS C4USS)	Michael Weingarten	michael.weingarten@lmco.com
View Online	N171-049	Cyber Resiliency via Virtualization for Combat Systems	Develop a virtualization capability that provides cyber resiliency for the AEGIS and Ship Self Defense Ship (SSDS) Combat Systems.	LM Missiles and Fire Control (MFC) LM Rotary and Mission Systems, Integrated Warfare Systems & Sensors (RMS IWSS)	John Fontana Rebecca Gerskhovich	john.c.fontana@lmco.com rebecca.gershkovich@lmco.com
View Online	N171-050	Software-based Modular and Extensible Cybersecurity Framework for Combat Systems	Develop a modular, extensible, open, and updateable software-based cybersecurity framework for the AEGIS and Ship Self Defense Ship (SSDS) Combat Systems used to integrate multiple cybersecurity capabilities.	LM Rotary and Mission Systems, Cyber, Ships and Advanced Technologies (RMS CSAT) LM Missiles and Fire Control (MFC) LM Rotary and Mission Systems, Integrated Warfare Systems & Sensors (RMS IWSS)	Gretchen Head John Fontana Rebecca Gerskhovich	gretchen.head@lmco.com john.c.fontana@lmco.com rebecca.gershkovich@lmco.com
View Online	N171-051	Advanced Direct Digital Exciter for Radar	Develop advanced direct digital exciter software and associated hardware technology for direct synthesis of radar waveforms to improve performance and reduce cost.	LM Missiles and Fire Control (MFC) LM Rotary and Mission Systems, Integrated Warfare Systems & Sensors (RMS IWSS)	John Fontana Rebecca Gerskhovich	john.c.fontana@lmco.com rebecca.gershkovich@lmco.com
View Online	N171-052	Data Science and Big Data Learning Algorithms and Analysis for Improved Operational Availability	Develop a learning algorithm behind the Internet of Things and Big Data analytics to more accurately predict ship equipment health conditions subsequent asset operational availability.	LM Rotary and Mission Systems, Cyber, Ships and Advanced Technologies (RMS CSAT) LM Missiles and Fire Control (MFC) LM Rotary and Mission Systems, Integrated Warfare Systems & Sensors (RMS IWSS) LM Space Systems - SMD	Gretchen Head John Fontana Rebecca Gerskhovich Jeff Bowers	gretchen.head@lmco.com john.c.fontana@lmco.com rebecca.gershkovich@lmco.com jeff.bowers@lmco.com
View Online	N171-053	Automatic Acoustic Detection and Identification	Develop an acoustic detection and identification system to provide automatic situational awareness capabilities for the Navys Unmanned Surface Vessels (USVs).	LM Missiles and Fire Control (MFC) LM Rotary and Mission Systems, C4 & Undersea Systems (RMS C4USS)	John Fontana Michael Weingarten	john.c.fontana@lmco.com michael.weingarten@lmco.com
View Online	N171-054	Cyber Threat Insertion and Evaluation Technology for Navy Ship Control Systems	Develop a system to evaluate the effectiveness of cyber defense technology for Navy ship control systems.	LM Rotary and Mission Systems, Cyber, Ships and Advanced Technologies (RMS CSAT) LM Missiles and Fire Control (MFC) LM Rotary and Mission Systems, C4 & Undersea Systems (RMS C4USS) LM Rotary and Mission Systems, Integrated Warfare Systems & Sensors (RMS IWSS)	Gretchen Head John Fontana Michael Weingarten Rebecca Gerskhovich	gretchen.head@lmco.com john.c.fontana@lmco.com michael.weingarten@lmco.com rebecca.gershkovich@lmco.com
View Online	N171-055	Methods for Measuring an Acoustic Arrays Straightness and for Autonomous Mechanical Straightening to Avoid Contact with Sea Bottom Under All Operational Conditions	Develop methods for measuring an acoustic arrays straightness and enabling the array to autonomously straighten itself mechanically while avoiding contact with the sea bottom under all operational conditions.	LM Rotary and Mission Systems, C4 & Undersea Systems (RMS C4USS)	Michael Weingarten	michael.weingarten@lmco.com
View Online	N171-056	Application Memory Space Integrity Monitor	Develop a system to monitor software applications memory space for the AEGIS and Ship Self Defense System (SSDS) Combat Systems to determine if a cyber-attack is occurring.	LM Rotary and Mission Systems, Integrated Warfare Systems & Sensors (RMS IWSS)	Rebecca Gerskhovich	rebecca.gershkovich@lmco.com
View Online	N171-057	Circulator Technology for Full Integration at the Monolithic Microwave Integrated Circuit (MMIC) Level	Develop circulator technology for full integration at the MMIC level, compatible with Gallium Nitride (GaN) technology, for cost reduction and performance enhancement.	LM Missiles and Fire Control (MFC) LM Rotary and Mission Systems, Integrated Warfare Systems & Sensors (RMS IWSS)	John Fontana Rebecca Gerskhovich	john.c.fontana@lmco.com rebecca.gershkovich@lmco.com
View Online	N171-058	Agnostic Bi-Directional Data Exchange	Design an innovative and expandable data transportation scheme for the AN/UYQ-100 Undersea Warfare Decision Support System (USW-DSS) that translates bi-directional data exchanges between disparate and diverse data sources into a common language.	LM Rotary and Mission Systems, C4 & Undersea Systems (RMS C4USS)	Michael Weingarten	michael.weingarten@lmco.com
View Online	N171-059	Verification and Optimization of Advanced Finite Element Modeling Techniques for Complex Submarine Hull Structures	Develop and validate a design tool for use in the creation of finite element models (FEM) and assessing the accuracy of finite element analysis results of complex submarine structures in critical areas of joints and stress concentrations.	LM Rotary and Mission Systems, C4 & Undersea Systems (RMS C4USS)	Michael Weingarten	michael.weingarten@lmco.com
View Online	N171-060	: Development of Explosive Feedstock for Commercial-off-the-Shelf (COTS) 3D Printers	Develop explosive feedstock for use in commercial-off-the-shelf (COTS) 3-D printer systems.	LM Missiles and Fire Control (MFC)	John Fontana	john.c.fontana@lmco.com
View Online	N171-061	Fusion Center/GUI for Shipboard Maintenance Activities and Supply Chain	Develop a GUI for shipboard Prognostic Health Management that optimizes innovative data visualization schemas and techniques for all available ship maintenance data.	LM Rotary and Mission Systems, Cyber, Ships and Advanced Technologies (RMS CSAT) LM Rotary and Mission Systems, Integrated Warfare Systems & Sensors (RMS IWSS)	Gretchen Head Rebecca Gerskhovich	gretchen.head@lmco.com rebecca.gershkovich@lmco.com
View Online	N171-062	3D Image from Sensor Fusion	Develop software to fuse underwater sensor data into a 3D model to assist operators with target identification.	LM Missiles and Fire Control (MFC) LM Rotary and Mission Systems, C4 & Undersea Systems (RMS C4USS) LM Space Systems - SMD	John Fontana Michael Weingarten Jeff Bowers	john.c.fontana@lmco.com michael.weingarten@lmco.com jeff.bowers@lmco.com
View Online	N171-063	Application of Telecommunications Laser Standards to Sonar Sensor Receivers	Advance the state of 1550nm laser technology, and design and develop an LMA that will support current Lightweight Wide Aperture Array (LWWAA) operation while lowering the modules cost.	LM Rotary and Mission Systems, C4 & Undersea Systems (RMS C4USS)	Michael Weingarten	michael.weingarten@lmco.com
View Online	N171-064	Oil-less Cooking Deep Fat Fryer (DFF) Replacement	Develop Oil-less Cooking Deep Fat Fryer (DFF) to reduce maintenance and decrease fire risk in an effort to replace currently existing Deep Fat Fryers (DFF) in the OHIO Replacement (OR) galley design.	LM Missiles and Fire Control (MFC)	John Fontana	john.c.fontana@lmco.com

View Online	N171-065	Broadband Sonar Digital Signal Processing (DSP) for Undersea Marine Life and Hazard Detection & Classification	Develop a cost-effective, innovative approach potentially using active broadband sonar techniques that will leverage todays commercial high-frequency technology to enable the automatic detection of marine mammals, sea turtles, and other protected biologics; UUVs; potential hazards; and human swimmers/divers as an alternative to the current approach.	LM Rotary and Mission Systems, C4 & Undersea Systems (RMS C4USS)	Michael Weingarten	michael.weingarten@lmco.com
View Online	N171-066	Computerized Psychological Techniques to Teach Knowledge and Increase Skill Levels Quickly	Develop a computerized innovative interactive visual, audio, and kinesthetic training program that increases the speed of learning, comprehension, and performance aboard ships to better cross-train sailors quickly.	LM Missiles and Fire Control (MFC)	John Fontana	john.c.fontana@lmco.com
View Online	N171-067	Biologic SONAR and Processing Network Improvement for Situational Awareness	To develop a behavioral algorithm to increase efficiency and improve reliability of high frequency SONAR applications and SONAR processing networks.	LM Rotary and Mission Systems, C4 & Undersea Systems (RMS C4USS)	Michael Weingarten	michael.weingarten@lmco.com
View Online	N171-068	Innovative Capstan Rim Friction Coating	Develop a new coating to improve friction coefficient on capstan drive rims to improve array deployment forces.	LM Missiles and Fire Control (MFC) LM Rotary and Mission Systems, C4 & Undersea Systems (RMS C4USS)	John Fontana Michael Weingarten	john.c.fontana@lmco.com michael.weingarten@lmco.com
View Online	N171-069	Submarine Safety (SUBSAFE) Compliant Connection for External Sensors	Develop an innovative hull penetration system / communications interface to support long duration undersea interface for communication with external sensors vehicles while complying with current Submarine Safety requirements.	LM Rotary and Mission Systems, C4 & Undersea Systems (RMS C4USS)	Michael Weingarten	michael.weingarten@lmco.com
View Online	N171-070	Non-Destructive Evaluation (NDE) of Additively Manufactured (AM) Parts	Develop a non-destructive evaluation (NDE) methodology that will enable inspection of additive manufactured (AM) parts.	LM Aeronautics (Aero) LM Rotary and Mission Systems, Cyber, Ships and Advanced Technologies (RMS CSAT) LM Space Systems LM Missiles and Fire Control (MFC) LM Rotary and Mission Systems, C4 & Undersea Systems (RMS C4USS)	Craig Owens Gretchen Head Jesus Isarraras John Fontana Michael Weingarten	craig.l.owens@lmco.com gretchen.head@lmco.com jesus.isarraras@lmco.com john.c.fontana@lmco.com michael.weingarten@lmco.com
View Online	N171-071	Plug-and-play Analytical Framework for Distributed Structured and Unstructured Data Sets for Condition Based Maintenance Plus (CBM+)	Create an agnostic algorithmic software framework, which consumes disparate sources of structured and unstructured data to increase the accuracy and fidelity of Prognostic Health Management (PHM) results.	LM Rotary and Mission Systems, C4 & Undersea Systems (RMS C4USS) LM Rotary and Mission Systems, Integrated Warfare Systems & Sensors (RMS IWSS)	Michael Weingarten Rebecca Gerskhovich	michael.weingarten@lmco.com rebecca.gershkovich@lmco.com
View Online	N171-072	Removable and Maintainable Future Hull Arrays	Develop an innovative hull array technology that allows removal and replacement of failed sections of a hull array and that will significantly reduce life cycle costs.	LM Rotary and Mission Systems, C4 & Undersea Systems (RMS C4USS)	Michael Weingarten	michael.weingarten@lmco.com
View Online	N171-073	Submarine Shipboard Power Unbalance Correction	Develop a power unbalance conditioning system for submarine electrical systems enabling correction of 3-phase current unbalance.	LM Rotary and Mission Systems, C4 & Undersea Systems (RMS C4USS)	Michael Weingarten	michael.weingarten@lmco.com
View Online	N171-074	Affordable, Fast-Tunable, Notch Filters at X-Band and Higher Frequencies	Develop fast, affordable and reliable tunable notch filters at X-band and higher frequencies for electronic warfare and military communications systems that suppress interference.	LM Rotary and Mission Systems, Cyber, Ships and Advanced Technologies (RMS CSAT) LM Missiles and Fire Control (MFC) LM Rotary and Mission Systems, Integrated Warfare Systems & Sensors (RMS IWSS)	Gretchen Head John Fontana Rebecca Gerskhovich	gretchen.head@lmco.com john.c.fontana@lmco.com rebecca.gershkovich@lmco.com
View Online	N171-075	Submarine Shipboard Power Supply Bridge	Develop a high power, short duration, power supply capability for submarine electrical systems enabling continuous operation through bus bar (BUS) transfers and reducing inrush current magnitude.	LM Rotary and Mission Systems, C4 & Undersea Systems (RMS C4USS)	Michael Weingarten	michael.weingarten@lmco.com
View Online	N171-076	Light-field Processing Unit for Extreme Multi-View Displays	Develop a Light-field Processing Unit (LfPU) for AEGIS Display Systems that reduce the Size, Weight and Power and Cost (SWaP-C) of real-time synthetic light-field generation.	LM Rotary and Mission Systems, C4 & Undersea Systems (RMS C4USS) LM Rotary and Mission Systems, Integrated Warfare Systems & Sensors (RMS IWSS)	Michael Weingarten Rebecca Gerskhovich	michael.weingarten@lmco.com rebecca.gershkovich@lmco.com
View Online	N171-077	Food Service Integrated Barcode and Inventory Management System	Develop a Financial Improvement and Audit Readiness (FIAR) compliant integrated barcode and inventory management system with handheld capability that allows for the collection and interpretation of linear and non-linear barcode information affixed to material or inventory locations, conducting inventories, processing of material receipts/issues/returns, and updating inventory based on transactions. The integrated barcode and inventory management system shall interface with the Navy Food Service Management System (FSM) and be capable of operating in afloat and ashore galleys.			
View Online	N171-078	Culinary Specialist (CS) Food Service Support Platform	Develop and deploy a mobile/portable platform capable of delivering seamless access to preparation of food service management documentation and hands-on video recipe tutorials thereby allowing US Navy Culinary Specialists (CSs) to deliver effective and efficient food preparation services.			
View Online	N171-079	Human Performance Self-Service Kiosk and Application	Develop a platform with interactive touch screen, such as a self-service Kiosk, that displays human performance information, serving as an education tool for the user of afloat and shore based galleys.			
View Online	N171-080	High Fidelity Acoustic Scattering Models for Large Objects	To develop and demonstrate an accurate and efficient computational method for calculating undersea acoustic scattering strength of mid-frequency targets.	LM Rotary and Mission Systems, C4 & Undersea Systems (RMS C4USS)	Michael Weingarten	michael.weingarten@lmco.com
View Online	N171-081	High Performance Thermal Interface Material for Energy Storage Devices and Other Electronic Components	The technical objective of this topic is to develop a thermal interface material for use in militarized battery modules which has the following characteristics: robust to vibration and abrasion, non-permanent bonding, high dielectric strength, and high thermal conductance.	LM Rotary and Mission Systems, C4 & Undersea Systems (RMS C4USS)	Michael Weingarten	michael.weingarten@lmco.com
View Online	N171-082	UAV-Compatible Secondary Payload for Meteorological Profiling	Develop, demonstrate and transition a Navy Unmanned Aerial Vehicle (UAV)-compatible secondary payload for meteorological profiling on small and medium sized Unmanned Aerial Systems (UAS) to improve Electromagnetic Maneuver Warfare (EMW) and Intelligence, Surveillance, and Reconnaissance (ISR) sensor performance prediction, as well as aviation weather hazard sensing, avoidance and mitigation, and forecasting.	LM Rotary and Mission Systems, C4 & Undersea Systems (RMS C4USS)	Michael Weingarten	michael.weingarten@lmco.com

View Online	N171-083	Late-Stage Software Feature Reduction Tool for Security and Performance	Investigate, design, and develop an automated or semi-automated software tool for the discovery, detection, and removal of unwanted or unnecessary software program features in any commonly used programming language.			
View Online	N171-084	Artificial Intelligence for Infantry Simulation in Small Unit Decision Making Training	Develop technologies to support the construction of Artificial Intelligence agents for use in simulations in infantry small unit decision making training. Agents must have realistic thinking, require minimal manual coding and editing of behaviors, and the tools must be capable of developing behaviors across a range of military infantry activities.	LM Space Systems - SMD	Jeff Bowers	jeff.bowers@lmco.com
View Online	N171-085	Transportable Ultrashort Pulsed Laser (USPL) Characterization System	The objective of this topic is to develop, design, construct, and deliver a compact, transportable instrument that can characterize ultra-short pulsed laser pulses including all spatial, temporal, spectral, pulse energy, and phase properties on a pulse-by-pulse basis.	LM Space Systems LM Missiles and Fire Control (MFC)	Jesus Isarraras John Fontana	jesus.isarraras@lmco.com john.c.fontana@lmco.com
View Online	N171-086	Compact, Low Loss, Broadband Power Inductors for Navy Sonar Applications	Develop compact, low loss, high power inductors with inductances >25 mH to match single crystal projectors to power amplifiers in a size suitable for use in Unmanned Underwater Vehicles (UUV), improving energy efficiency by at least 50% and thereby increasing vehicle operational availability.			
View Online	N171-087	Autonomous Cargo Handling System	Develop an autonomous cargo loading/unloading system to be demonstrated in conjunction with the Autonomous Aerial Cargo Utility System (AACUS) equipped UH-1H Optionally Piloted Aircraft (OPA) that will provide a capability to deliver supplies autonomously to a manned or unmanned location.	LM Missiles and Fire Control (MFC) LM Rotary and Mission Systems, C4 & Undersea Systems (RMS C4USS)	John Fontana Michael Weingarten	john.c.fontana@lmco.com michael.weingarten@lmco.com
View Online	N171-088	Nickel Aluminum Bronze for Additive Manufacturing Alloy Development	Develop, optimize and demonstrate use of a nickel aluminum bronze (NAB) alloy composition optimized for the additive manufacturing process for large seawater components (>12"). The alloy must exceed the current mechanical and seawater corrosion resistance of cast NAB alloy C95800.	LM Aeronautics (Aero) LM Missiles and Fire Control (MFC) LM Rotary and Mission Systems, C4 & Undersea Systems (RMS C4USS)	Craig Owens John Fontana Michael Weingarten	craig.l.owens@lmco.com john.c.fontana@lmco.com michael.weingarten@lmco.com
View Online	N171-089	Multi-Beam, Free-Space Optical Terminal for Tactical Operations	Free-space optical, or laser, communications have a number of attractive features: 1) increased bandwidth, 2) difficult to deny, and 3) difficult to exploit. The objective of this proposal is to develop a free-space optical terminal with a multi-beam transmit/receive capability that can be deployed on USN/USMC platforms.			
View Online	N171-090	Understanding AM Solidification Profile Effects on Material Inhomogenieties, Defects, and Qualification	To develop a model relating the melting/solidification profile of metals/alloys to the metal/alloy microstructure during additive manufacturing (AM) processing. The model should describe how the melting/solidification profile influences the generation of microstructural inhomogeneities and defects as a function of power, speed and materials for a given AM process as a function of build depth. Process parameter correlation with different materials via integrated computational materials engineering (ICME) should be utilized so that defect and inhomogeneities can be minimized, part property variations within the component can be minimized, and its performance can be qualified	LM Missiles and Fire Control (MFC)	John Fontana	john.c.fontana@lmco.com
View Online	N171-091	Synthetic Vision System for Ground Forces	This effort seeks to accelerate and enhance decision making for Marine Corps Ground Forces by developing a Synthetic Vision System (SVS) extension for head-mounted displays (HMDs) to provide training aids and situational awareness (SA) visualizations.	LM Missiles and Fire Control (MFC)	John Fontana	john.c.fontana@lmco.com
View Online	N171-092	Pedagogy Models for Training in Mixed Reality Learning Environments	Develop, demonstrate, and validate mixed reality (MR) technology to improve training of maintenance procedures and troubleshooting skills for measured improvements in learning and transfer to workplace performance.	LM Missiles and Fire Control (MFC) LM Rotary and Mission Systems, Integrated Warfare Systems & Sensors (RMS IWSS)	John Fontana Rebecca Gerskhovich	john.c.fontana@lmco.com rebecca.gershkovich@lmco.com
View Online	N171-093	Theater Anti-Submarine Warfare Contextual Reasoning	To develop and demonstrate an expert system capable of applying contextual clues from theater anti-submarine data sources to evaluate the probable current and near term actions of threat submarines.	LM Rotary and Mission Systems, C4 & Undersea Systems (RMS C4USS)	Michael Weingarten	michael.weingarten@lmco.com
View Online	N171-094	Interferometric ISAR Imaging of Maritime Targets for Improved Classification	Develop innovative algorithmic approaches and ultimately radar processing software to generate 3-D inverse synthetic aperture radar (ISAR) and also develop feature extraction algorithms from the 3-D (ISAR) imagery formed to support vessel classification.	LM Missiles and Fire Control (MFC) LM Rotary and Mission Systems, C4 & Undersea Systems (RMS C4USS) LM Rotary and Mission Systems, Integrated Warfare Systems & Sensors (RMS IWSS) LM Space Systems - SMD	John Fontana Michael Weingarten Rebecca Gerskhovich Jeff Bowers	john.c.fontana@lmco.com michael.weingarten@lmco.com rebecca.gershkovich@lmco.com jeff.bowers@lmco.com
View Online	N171-095	Shipboard Flywheel Energy Storage Parasitic Reduction	Develop low parasitic components, materials, or methodologies to improve shipboard megawatt (MW) scale flywheel design and operation in a shipboard environment.	LM Rotary and Mission Systems, C4 & Undersea Systems (RMS C4USS)	Michael Weingarten	michael.weingarten@lmco.com
View Online	N171-096	Real Time Computation of Precision 3D Models Using Low Size, Weight, and Power (SWAP) Architectures	Develop a capability to generate a current high-precision 3D terrain model of an urban environment from Wide Area Airborne Surveillance (WAAS) imagery using very low Size, Weight, and Power (SWAP) airborne processor. The models must be sufficiently timely and accurate to support planning of ground and air ingress, weapons delivery, and egress during an ongoing operation.	LM Missiles and Fire Control (MFC)	John Fontana	john.c.fontana@lmco.com
View Online	N171-097	Sustainable Autonomous Target Recognition of Maritime Targets from Passive ISAR Imagery	Develop innovative algorithmic approaches for bistatic Inverse Synthetic Aperture Radar (ISAR) imaging and a robust, efficient, sustainable, and high performance automated target recognition (ATR) approaches for passive ISAR imaging. Passive imaging enables one platform to provide for the illumination needs of multiple platforms, reducing both energy usage and threat exposure of the passive collection platforms.	LM Rotary and Mission Systems, Cyber, Ships and Advanced Technologies (RMS CSAT) LM Missiles and Fire Control (MFC) LM Rotary and Mission Systems, C4 & Undersea Systems (RMS C4USS) LM Rotary and Mission Systems, Integrated Warfare Systems & Sensors (RMS IWSS) LM Space Systems - SMD	Gretchen Head John Fontana Michael Weingarten Rebecca Gerskhovich Jeff Bowers	gretchen.head@lmco.com john.c.fontana@lmco.com michael.weingarten@lmco.com rebecca.gershkovich@lmco.com jeff.bowers@lmco.com

View Online	N171-098	Cellular Base Station for Low Earth Orbit Space Missions	Develop and cellular radio base station compatible with the Mobile User Objective System (MUOS), using Wideband Code Division Multiple Access (WCDMA) technology, for use in CubeSat payload in Low Earth Orbit.	LM Space Systems LM Space Systems - SMD	Jesus Isarraras Jeff Bowers	jesus.isarraras@lmco.com jeff.bowers@lmco.com
View Online	N171-099	Next Generation Ultra High Frequency (UHF) Unified Satellite Communication Control System	Develop the next generation satellite control system (both software and hardware) that supports Demand Assigned Multiple Access (DAMA) 5 kHz, 25 kHz and Integrated Waveform (IW) protocols and MIL-STDs and is RF radio independent for the purpose of cost and equipment footprint reduction.			
View Online	A17-001	Lightweight, Durable, Low-Cost Recuperators Designed for Integration with Small Turbo-generators for Future Army Unmanned Aerial Systems	Develop and demonstrate lightweight, durable, low cost recuperators for 5 Kilowatt turbo-generators to power DoD Group 2/small Group 3 unmanned aerial systems (UASs) for increased reliability and operational capability.			
View Online	A17-002	Advanced Electric Motor Technology for Hybrid More Electric/Micro-Turbine Architectures	Develop and demonstrate lightweight, durable, high power density electric motor technologies for main/auxiliary propulsors to enable future turbo-generators to power DoD Group 2/small Group 3 unmanned aerial systems (UASs) for increased reliability and operational capability.			
View Online	A17-003	Development of In-Process Monitoring Closed-Loop Feedback for Use in Aluminum Alloy Additive Manufacturing (AM) Applications	Develop and demonstrate in-process monitoring and closed-loop feedback methods that can be utilized in metallic additive manufacturing processes to improve repeatability for geometric dimensions, material properties, and quality.	LM Aeronautics (Aero) LM Space Systems LM Missiles and Fire Control (MFC) LM Rotary and Mission Systems, C4 & Undersea Systems (RMS C4USS) LM Space Systems - SMD	Craig Owens Jesus Isarraras John Fontana Michael Weingarten Jeff Bowers	craig.l.owens@lmco.com jesus.isarraras@lmco.com john.c.fontana@lmco.com michael.weingarten@lmco.com jeff.bowers@lmco.com
View Online	A17-004	Composite Bondline Inspection for Structural Integrity	Develop a non-destructive bondline inspection technique suitable for assessing structural integrity of high-efficiency composite structures.	LM Aeronautics (Aero) LM Rotary and Mission Systems, Cyber, Ships and Advanced Technologies (RMS CSAT) LM Space Systems - SMD	Craig Owens Gretchen Head Jeff Bowers	craig.l.owens@lmco.com gretchen.head@lmco.com jeff.bowers@lmco.com
View Online	A17-005	Long-life, Shelf-stable, Wet Layup Laminating Resins and Paste Adhesives	To develop a wet layup laminating resin and a paste adhesive that remain viable in diverse environments for an extended time period, while maintaining the strength, stiffness, and weight efficiency of modern high-strength composite materials.	LM Aeronautics (Aero) LM Missiles and Fire Control (MFC)	Craig Owens John Fontana	craig.l.owens@lmco.com john.c.fontana@lmco.com
View Online	A17-006	Model-Based Testing of Integrated Aviation Mission Systems	Reduce aviation mission system integration testing time and effort and increase assurance by developing testing tools that support a model-based system development process. Develop a software tool that will check instrumentation data collected from an integrated mission system to see if the observed system behaviors of an integrated mission system conforms to required and allowed behaviors defined in an Architectural Analysis and Design Language (AADL) model of the integrated aviation software and hardware mission system.	LM Space Systems LM Space Systems	Brian Zimbelman Jesus Isarraras	brian.zimbelman@lmco.com jesus.isarraras@lmco.com
View Online	A17-007	Rapid Configuration of Heterogeneous Collaborative Aviation System-of-Systems Simulations	Develop a tool suite for supporting rapid integration of aviation mission system prototype equipment and emulators in System Integration Labs (SILs) and then into federated System-of-Systems (SoS) test and evaluation simulations. Given an architecture description language model specified in the SAE AS 5506 Architecture Analysis and Design Language (AADL) of a mission system and an overall federation of simulations, provide a suite of tools to analyze that model to assure important quality metrics such as performance, timing, latency, safety, security and interface compatibility and automatically generate the configuration data needed to assemble and execute the overall federated simulation. The tool suite should provide a capability that allows collaborating organizations to assemble and test fly aviation mission systems in various configurations and stages of development in simulated aviation mission scenarios.	LM Rotary and Mission Systems, Cyber, Ships and Advanced Technologies (RMS CSAT) LM Space Systems LM Rotary and Mission Systems, Integrated Warfare Systems & Sensors (RMS IWSS)	Gretchen Head Jesus Isarraras Rebecca Gerskhovich	gretchen.head@lmco.com jesus.isarraras@lmco.com rebecca.gershkovich@lmco.com
View Online	A17-008	Tunable Textured Composites for Lightweight Power Systems	Develop magneto-electric composites with (a) power bandwidth >10MHz; (b) core-loss scaled with frequency, flux-density, & weight/volume; (c) textured magnetization to maintain high efficiency; (d) system-driven tunable magnetization to optimize efficiency.	LM Aeronautics (Aero) LM Missiles and Fire Control (MFC) LM Space Systems - SMD	Craig Owens John Fontana Jeff Bowers	craig.l.owens@lmco.com john.c.fontana@lmco.com jeff.bowers@lmco.com
View Online	A17-009	Long-Range Multiple Ballistic Missile Optimized Engagement in a Multi-Target Environment	Develop and evaluate architectures to optimize engagement and intercept of multiple threat assets by long-range ballistic missile interceptors with affordable, robust engagement algorithms.	LM Space Systems LM Rotary and Mission Systems, Integrated Warfare Systems & Sensors (RMS IWSS) LM Space Systems - SMD	Jesus Isarraras Rebecca Gerskhovich Jeff Bowers	jesus.isarraras@lmco.com rebecca.gershkovich@lmco.com jeff.bowers@lmco.com
View Online	A17-010	Ballistic Missile Defense Weather Management	Define the requirements and process for a Ballistic Missile Defense weather vulnerability assessment system applicable to air missile defense mission planning.	LM Space Systems LM Rotary and Mission Systems, Integrated Warfare Systems & Sensors (RMS IWSS) LM Space Systems - SMD	Jesus Isarraras Rebecca Gerskhovich Jeff Bowers	jesus.isarraras@lmco.com rebecca.gershkovich@lmco.com jeff.bowers@lmco.com
View Online	A17-011	Multi-stage Shaped-charge Warheads	To develop warheads capable of perforating light armored vehicles (LAV), unmanned aerial system (UAS) and unmanned aerial vehicles (UAV), coupled with a follow through mechanism that will defeat various targets.	LM Missiles and Fire Control (MFC) LM Space Systems - SMD	John Fontana Jeff Bowers	john.c.fontana@lmco.com jeff.bowers@lmco.com
View Online	A17-012	Biodegradable Composites with Embedded Seeds for Training Ammunition	Develop biodegradable training ammunition loaded with specialized seeds to grow environmentally beneficial plants that eliminate ammunition debris and contaminants.	LM Missiles and Fire Control (MFC)	John Fontana	john.c.fontana@lmco.com
View Online	A17-013	Munition-Delivered Non-Kinetic Effects (NKE)	Develop and demonstrate an innovative, cost-effective, munitions-based electronics systems that can deliver non-destructive, non-kinetic RF effects against a wide range of electronics, critical infrastructure, and computer-based systems.	LM Missiles and Fire Control (MFC) LM Rotary and Mission Systems, Integrated Warfare Systems & Sensors (RMS IWSS) LM Space Systems - SMD	John Fontana Rebecca Gerskhovich Jeff Bowers	john.c.fontana@lmco.com rebecca.gershkovich@lmco.com jeff.bowers@lmco.com

View Online	A17-014	Eutectics and Nanomaterials-based Supercapacitors for Enhanced Low-temperature Performance	The objective of this topic is to research innovations for electrolyte optimization such as room temperature ionic liquids and deep eutectic solvents to widen the operating temperature (-45 C to 65 C), nanostructured electrode materials to improve the electrode/electrolyte interface for higher power/energy densities, and cost-effective large scale synthesis of next generation supercapacitors.	LM Missiles and Fire Control (MFC) LM Space Systems - SMD	John Fontana Jeff Bowers	john.c.fontana@lmco.com jeff.bowers@lmco.com
View Online	A17-015	Methods for Determining Threat Level and Intent of Unmanned Aerial Systems	Develop and demonstrate an innovative, cost-effective, lightweight, tripod mounted system that can search/surveillance, detect, identify, track and determine the intent and threat level of Unmanned Aerial Vehicles. The development of a flexible, tripod mounted, low-cost, low-power consumption system capable of taking over the navigation systems and can impart key functions necessary for the hostile UAV to safely navigate and land in a safe place for further characterization/exploitation. This multi-band RF / multi-mode software defined radio (SDR) and EO/IR tripod mounted suite of sensors shall be easy to operate, MMI, designed to defeat frequency hopping and collision avoidance UASs and collect the information necessary to make engagement decisions based on the nature of the threat through payload evaluation, flight path analysis, and configuration.	LM Missiles and Fire Control (MFC) LM Rotary and Mission Systems, Integrated Warfare Systems & Sensors (RMS IWSS)	John Fontana Rebecca Gerskhovich	john.c.fontana@lmco.com rebecca.gershkovich@lmco.com
View Online	A17-016	Spin Compensation for Shaped Charge Liners	Develop and demonstrate shaped charge warheads that can maintain penetration capabilities when spinning.			
View Online	A17-017	Base-deployed Soft-Recovery Module for Precision Artillery	To develop a module that features a parachute or a similar innovative solution to allow soft recovery of an artillery round carrying precision guidance components.	LM Missiles and Fire Control (MFC)	John Fontana	john.c.fontana@lmco.com
View Online	A17-018	Biologically-Derived Targeted Antifungals for Textile Applications	Develop and demonstrate an effective and economical biologically-derived technology to kill or inhibit the growth of specific fungal organisms while demonstrating durability and stability on a textile.			
View Online	A17-019	CMOS Compatible Deposition of Multi-Ferroic Films for Tunable Microwave Applications	Develop and demonstrate a manufacturing-scalable, low temperature deposition process for high quality multi-layers of high quality multiferroic thin films, compatible with silicon CMOS (Complementary metaloxidesemiconductor) foundry processing, for advanced tunable microwave components integrated into commercial integrated circuits.	LM Missiles and Fire Control (MFC)	John Fontana	john.c.fontana@lmco.com
View Online	A17-020	Lithium Ion Battery Electrodes Manufacturing to Improve Power and Energy Performance	Develop novel electrode materials/designs and manufacturing processes which enable high power and high energy lithium battery performance without the use of flammable/toxic solvents.	LM Rotary and Mission Systems, Cyber, Ships and Advanced Technologies (RMS CSAT) LM Space Systems LM Missiles and Fire Control (MFC) LM Rotary and Mission Systems, C4 & Undersea Systems (RMS C4USS) LM Space Systems - SMD	Gretchen Head Jesus Isarraras John Fontana Michael Weingarten Jeff Bowers	gretchen.head@lmco.com jesus.isarraras@lmco.com john.c.fontana@lmco.com michael.weingarten@lmco.com jeff.bowers@lmco.com
View Online	A17-021	Low Cost, Compact, and High Power Terahertz Emitter Arrays with 1550-nm Telecommunications Laser Drivers	To develop compact, highly efficient, and high power terahertz emitter arrays driven by low cost, fiber-based 1550-nm telecommunications lasers.	LM Missiles and Fire Control (MFC)	John Fontana	john.c.fontana@lmco.com
View Online	A17-022	High-Speed Cryogenic Optical Connector for Focal Plane Array Read-out	To develop faster and more efficient free-space optical interconnect solutions for connecting focal plane arrays with high-speed read-out integrated circuits in cryogenic dewars to the outside world thru a transparent window.	LM Space Systems - SMD	Jeff Bowers	jeff.bowers@lmco.com
View Online	A17-023TITLE: Lea	Lead Acid Battery Monitoring, Diagnostics, and Prognostics	Develop and demonstrate advanced techniques for lead acid battery monitoring, diagnosis, and prognosis in order to reduce lead acid battery failures and predict battery failure.	LM Missiles and Fire Control (MFC)	John Fontana	john.c.fontana@lmco.com
View Online	A17-024	HPC enabled FDTD Channel Modeling for Dense Urban Scenes in the HF/VHF Band	This SBIR focuses on the development of highly efficient Finite-Difference-Time-Domain (FDTD) propagation codes that are portable onto high performance computer (HPC) clusters for applications at High Frequency (HF) and Very High Frequency (VHF) bands, for the development of mobile ad hoc radio networks.	LM Missiles and Fire Control (MFC) LM Rotary and Mission Systems, Integrated Warfare Systems & Sensors (RMS IWSS)	John Fontana Rebecca Gerskhovich	john.c.fontana@lmco.com rebecca.gershkovich@lmco.com
View Online	A17-025	Safe Solid State High Power, High Energy Conformal Energy Storage	The objective of this effort is to develop portable conformal rechargeable solid state high energy storage devices for soldiers with enhanced safety and reduced weight.	LM Rotary and Mission Systems, Cyber, Ships and Advanced Technologies (RMS CSAT) LM Missiles and Fire Control (MFC) LM Space Systems - SMD	Gretchen Head John Fontana Jeff Bowers	gretchen.head@lmco.com john.c.fontana@lmco.com jeff.bowers@lmco.com
View Online	A17-026	Environmentally Intelligent Autonomous System	Develop technologies to embed ARLs Automated Impacts Routing into autonomous multi-rotor platform technology to automatically inform navigation processes.	LM Missiles and Fire Control (MFC) LM Rotary and Mission Systems, C4 & Undersea Systems (RMS C4USS)	John Fontana Michael Weingarten	john.c.fontana@lmco.com michael.weingarten@lmco.com
View Online	A17-027	Linear Efficient Broadband Transmitter Architecture at mm-wave frequencies	To develop and demonstrate integrated circuits required to obtain highly linear and efficient transmitters at mm-wave frequencies.	LM Missiles and Fire Control (MFC) LM Rotary and Mission Systems, Integrated Warfare Systems & Sensors (RMS IWSS)	John Fontana Rebecca Gerskhovich	john.c.fontana@lmco.com rebecca.gershkovich@lmco.com
View Online	A17-028	Multi-Fuel Burners for Soldier Power	To design, develop, and demonstrate the feasibility of an efficient and lightweight multi-fuel burner for soldier-borne battery re-charging.	LM Rotary and Mission Systems, C4 & Undersea Systems (RMS C4USS)	Michael Weingarten	michael.weingarten@lmco.com
View Online	A17-029	Colloidal Quantum Dots for Cost Reduction in EO/IR Detectors for Infrared Imaging	To develop mid wave infrared (MWIR) imaging detectors operating at temperatures greater than 250K utilizing low-cost colloidal quantum dots (CQD) photodiode technology.	LM Missiles and Fire Control (MFC)	John Fontana	john.c.fontana@lmco.com
View Online	A17-030	Self Regenerative Coatings for Enhanced Protection of Silicon Based Ceramic Composites in Particle Laden Degraded Engine Environments	Develop self-regenerative enhanced protection compositions of silicon based ceramic matrix composites exposed to particle laden degraded Engine environments.	LM Missiles and Fire Control (MFC)	John Fontana	john.c.fontana@lmco.com

View Online	A17-031	High-Fidelity Design Tools and Technologies for High-Pressure Heavy Fuel Injectors	Develop high-fidelity science-based tools for the design and demonstration of innovative high-pressure heavy fuel injector technology for Aerial and Ground Engines.			
View Online	A17-032	Revolutionary Concepts for Multi-Mode Adaptive Advanced Cycle Gas Turbine Engine	Develop a revolutionary design concept and technologies for modular multi-mode adaptive advanced cycle gas turbine engines for Vertical Take-Off and Landing (VTOL) aircraft/UAVs (Unmanned Aerial Vehicles).			
View Online	A17-033	Low-Cost, Lightweight, High-Strength Structural Materials for Small and Medium Caliber Sabots	Develop lightweight metallic or polymer composite sabots for medium and small caliber ballistic applications utilizing new and novel materials and manufacturing methods.	LM Missiles and Fire Control (MFC) LM Space Systems - SMD	John Fontana Jeff Bowers	john.c.fontana@lmco.com jeff.bowers@lmco.com
View Online	A17-034	Lightweight Bullet and Fragment Impact Protection for Mobile Missile Launcher	Develop a lightweight panel capable of reducing the reaction of a munition that is impacted by bullets or fragments.	LM Rotary and Mission Systems, Cyber, Ships and Advanced Technologies (RMS CSAT) LM Missiles and Fire Control (MFC)	Gretchen Head John Fontana	gretchen.head@lmco.com john.c.fontana@lmco.com
View Online	A17-035	Inspection System for Body and Vehicle Ballistic Armor	Develop a man-portable, Non-Destructive Inspection (NDI) system for expedient body armor and vehicle ballistic armor damage assessment.	LM Missiles and Fire Control (MFC)	John Fontana	john.c.fontana@lmco.com
View Online	A17-036	Civil Affairs Information and Military Sustainment in the Megacity Environment	Develop simulation, analytic, and visualization capabilities of the complex sociocultural landscape of a megacity to produce a civil affairs common operating picture.			
View Online	A17-037	Data Security and Integrity Enhancements for Databases in the Tactical Environment	Currently, Apache Accumulo is the primary Database solution with native support for cell-level visibility with associated pedigree and provenance attribution. While Accumulo is optimized for clustered Cloud Computing environments, there is a need for a secure database solution within non-clustered environments for implementation within the Tactical Space where computing and storage resources are limited. Implementing a cell-level visibility solution within a traditional relational database would provide these capabilities in a form that can be employed within the tactical environment, while continuing to support existing relational database implementations.	LM Missiles and Fire Control (MFC) LM Rotary and Mission Systems, C4 & Undersea Systems (RMS C4USS)	John Fontana Michael Weingarten	john.c.fontana@lmco.com michael.weingarten@lmco.com
View Online	A17-038	Anti-Helicopter Mine and Improvised Explosive Device Countermeasures	Identify technical approaches and potential technical solutions to the threat of employed anti-helicopter mines and Improvised Explosive Devices (IEDs).	LM Missiles and Fire Control (MFC)	John Fontana	john.c.fontana@lmco.com
View Online	A17-039	Signal Processing at Radio Frequency (RF) for Position Navigation & Timing Co-Site Interference	Demonstrate an approach for reducing co-site interference on Position Navigation & Timing systems.	LM Missiles and Fire Control (MFC)	John Fontana	john.c.fontana@lmco.com
View Online	A17-040	UHF L-band Transmitter Receiver Antenna (ULTRA)	The objective of this topic is to research and develop a low-profile antenna that covers a frequency ranges of 950-2150MHz and 200-440MHz.	LM Missiles and Fire Control (MFC) LM Rotary and Mission Systems, Integrated Warfare Systems & Sensors (RMS IWSS)	John Fontana Rebecca Gerskhovich	john.c.fontana@lmco.com rebecca.gershkovich@lmco.com
View Online	A17-041	Small Agile Filter-Tunable (SAF-T)	Achieving communications and data links at required ranges for the Warfighter utilizing tunable RF filters with small form factor.			
View Online	A17-042	Ultra Short Pulse Laser	To create a short pulse, femtosecond (fs), high power laser system. The laser system should operate in the 3.0 m to 5.0 m wavelength with output powers no less than 1 TW at pulse widths at or below 900 fs and pulse cyclic frequency of 50 GHz.	LM Space Systems LM Missiles and Fire Control (MFC)	Jesus Isarraras John Fontana	jesus.isarraras@lmco.com john.c.fontana@lmco.com
View Online	A17-043	Fused positioning using imaging cameras and digital elevation data	Determine vehicle location with affordable uncooled infrared (IR) imaging cameras from a situational awareness system.	LM Missiles and Fire Control (MFC)	John Fontana	john.c.fontana@lmco.com
View Online	A17-044	Algorithms for ground vehicle on-the-move detection of Unmanned Aerial Systems	Develop On the Move Infrared Search ant Track (IRST) algorithms for an IRST consisting of multiple distributed aperture uncooled IR cameras for ground vehicles.	LM Missiles and Fire Control (MFC)	John Fontana	john.c.fontana@lmco.com
View Online	A17-045	Night Sky Characterization System	Develop a ruggedized non-imaging, spectrally sensitive night sky characterization system that can record the spectrally separated irradiance of the night sky across spectral bands from 400-2500nm.	LM Missiles and Fire Control (MFC)	John Fontana	john.c.fontana@lmco.com
View Online	A17-046	Image Enhancement in Heavily Degraded Visual Environments using Image Processing Methods	Produce an enhanced image suitable for driving ground vehicles in heavily degraded visual environments with minimal latency (<80 ms) using image processing methods. This is not a solicitation for new camera hardware.	LM Rotary and Mission Systems, Cyber, Ships and Advanced Technologies (RMS CSAT) LM Missiles and Fire Control (MFC)	Gretchen Head John Fontana	gretchen.head@lmco.com john.c.fontana@lmco.com
View Online	A17-047	High Definition Long Wave Infrared Spectral Camera	Develop a spectrally agile sensor operating in the Long Wave Infrared (LWIR) that is capable of high definition spatial imaging across a number of narrow spectral bands. The sensor shall be capable acquiring a minimum of 1024 spatial channels and 128 spectral channels.	LM Space Systems LM Missiles and Fire Control (MFC) LM Space Systems - SMD	Jesus Isarraras John Fontana	jesus.isarraras@lmco.com john.c.fontana@lmco.com jeff
View Online	A17-048	Digital In-Pixel Uncooled LWIR Bolometer Camera	Develop a digital pixel based uncooled longwave infrared (LWIR) bolometer array. Pixels within the array should be able to acquire and store data natively in a digital manner, while maintaining a low noise equivalent delta temperature (NEDT) and short time constant. The imager should be capable of no less than 16 bits of dynamic range scene content.	LM Missiles and Fire Control (MFC) LM Space Systems - SMD	Jeff Bowers	john.c.fontana@lmco.com jeff.bowers@lmco.com
View Online	A17-049	Airborne ISR Sensors Fusion Algorithms	Design and develop the algorithms needed to fuse multiple airborne Intelligence, Surveillance, and Reconnaissance (ISR) sensor modalities, with a focus on electro optical/infrared (EO/IR) sensors.	LM Space Systems LM Missiles and Fire Control (MFC) LM Space Systems - SMD	Jesus Isarraras John Fontana Jeff Bowers	jesus.isarraras@lmco.com john.c.fontana@lmco.com jeff.bowers@lmco.com

View Online	A17-050	Mitigating the Negative Effects of Polysulfide Dissolution in Lithium-Sulfur Batteries	The objective of this topic is to investigate ways to improve the cycle life and capacity retention of the lithium-sulfur battery chemistry by addressing the negative effects of parasitic polysulfide reactions.	LM Rotary and Mission Systems, Cyber, Ships and Advanced Technologies (RMS CSAT)	Gretchen Head Jeff Bowers	gretchen.head@lmco.com
View Online	A17-050	Mitigating the Negative Effects of Polysulfide Dissolution in Lithium-Sulfur Batteries	The objective of this topic is to investigate ways to improve the cycle life and capacity retention of the lithium-sulfur battery chemistry by addressing the negative effects of parasitic polysulfide reactions.	LM Rotary and Mission Systems, Cyber, Ships and Advanced Technologies (RMS CSAT)	Gretchen Head	gretchen.head@lmco.com
View Online	A17-051	Tightly Coupled Oscillator and GPS Receiver	Develop a highly reliable, externally aided, GPS receiver that leverages precise time information from an atomic clock with increased performance and integrity over typical feed forward time server designs.	LM Rotary and Mission Systems, C4 & Undersea Systems (RMS C4USS)	Michael Weingarten	michael.weingarten@lmco.com
View Online	A17-052	Multi-Spectral Threat Warning Adjunct Sensor	Develop a Multi-spectral adjunct sensor consisting of either single element detectors or a linear array with a variety of spectral bands in the UV/Visible/Infrared that can be used to aid in detection of aviation threats (Missiles, Hostile Fire, etc.). This sensor will be used as an adjunct to current Missile Warning/Hostile Fire Indication systems for improved capability.	LM Space Systems LM Missiles and Fire Control (MFC) LM Space Systems - SMD	Jesus Isarraras John Fontana Jeff Bowers	jesus.isarraras@lmco.com john.c.fontana@lmco.com jeff.bowers@lmco.com
View Online	A17-053	Analytic for Federated Data	Deployment of an analytic which would recognize repeated actions, interactions, and transactions that an analyst performs on device(s) to display information relevant to the analyst ex. in support of Multi-INT.	LM Missiles and Fire Control (MFC)	John Fontana	john.c.fontana@lmco.com
View Online	A17-054	GMTI Radar Target Classification Using Spectral and Tracking Data	The objective of this effort is to develop and demonstrate an algorithm that will allow an airborne or ground-based Ground Moving Target Indicator (GMTI) radar to discriminate among Humans, Vehicles, Animals and ground Clutter (HVAC) in Near Real Time (NRT) by using Doppler signatures, target track characteristics and (where applicable) group dynamics.	LM Missiles and Fire Control (MFC) LM Rotary and Mission Systems, Integrated Warfare Systems & Sensors (RMS IWSS)	John Fontana Rebecca Gerskhovich	john.c.fontana@lmco.com rebecca.gershkovich@lmco.com
View Online	A17-055	Semantic Mission Plan Representation	Perform research into the techniques for the semantic representation of mission plans and design an associated software tool set that facilitates the creation and manipulation of a mission plan as missions unfold.	LM Rotary and Mission Systems, Integrated Warfare Systems & Sensors (RMS IWSS) LM Space Systems - SMD	Rebecca Gerskhovich Jeff Bowers	rebecca.gershkovich@lmco.com jeff.bowers@lmco.com
View Online	A17-056	Paratrooper Operations in GPS-Degraded Environments	Develop and demonstrate the ability to track paratroopers through free-fall and landing, and locate other squad members to regroup after landing in a GPS denied environment.	LM Missiles and Fire Control (MFC)	John Fontana	john.c.fontana@lmco.com
View Online	A17-057	Non-toxic Hydrophobic Coatings for Improved Infrared and Red Phosphorus Obscurant Performance	To develop coatings for nanometer-sized metal flakes and rods which will reduce agglomeration and oxidation while maintaining infrared obscurant performance, and to develop coatings for red phosphorus which will be hydrophobic to eliminate phosphine production while not impacting burn rates or yield.	LM Missiles and Fire Control (MFC)	John Fontana	john.c.fontana@lmco.com
View Online	A17-058	Biotemplating for Synthesis of Metal Nanorods Used In Infrared Obscuration	To develop a method using bio-templating to synthesize high conductivity, infrared obscuration nanorods. Nanorod diameters should be as small as possible within the constraint of rod linearity. This may prove to be in the vicinity of 50 nm or might involve smaller nanostructures. There are three essential requirements for the nanorod produced. The length requirement is vital to the electromagnetic properties; the distribution must be relatively narrow with a length of about 3 m in order to produce a strong resonance within the far infrared atmospheric transmission window (8 to 12 m); there must not be debris of smaller sizes resulting from any of the processes involved. Even small mass percentages of these fines will destroy the infrared optical efficiency. Fines are generally defined as particles outside the operational window of the desired obscurant effect. Finally, the resulting nanorods must be easily separable.	LM Missiles and Fire Control (MFC)	John Fontana	john.c.fontana@lmco.com
View Online	A17-059	A Low-Toxicity, Non-Pyrotechnic, High Yield Visible Smoke Material	To develop a material that reacts with a component of the atmosphere when disseminated to produce a visible obscurant. The material will have to react nearly instantaneously upon release and be of such particle size as to produce agglomerates with the reacted component on the order of a micron or less. Packaging of the material will be a consideration to allow near instantaneous reaction and to prevent loss of effectiveness during storage.			
View Online	A17-060	Sensors for Assessing SeaPorts of Debarkation (SPOD)s	Develop/demonstrate technologies for aiding in planning and conducting A2AD entry operations. Develop force projection support technologies that provide an ability to rapidly update beach topography and surf-zone bathymetry in the dynamic littoral zone from small aerial platforms with quantified uncertainty for improved maneuver support and battlespace awareness during littoral operations.	LM Missiles and Fire Control (MFC) LM Rotary and Mission Systems, C4 & Undersea Systems (RMS C4USS)	John Fontana Michael Weingarten	john.c.fontana@lmco.com michael.weingarten@lmco.com
View Online	A17-061	Continuous Pavement Deflection Measurement System for Road and Airfield Pavements	Design and build hardware and software components for an air-transportable system capable of measuring pavement deflections from a moving platform for determining pavement layer strength/stiffness values. Measured pavement deflections and calculated stiffness values would be used to aide in rapid evaluation of pavement load carrying capability. As a secondary goal, this system may also be useful in locating areas with potentially hazardous voids and/or identifying fragile pavement sections posing a high risk for catastrophic failures.	LM Missiles and Fire Control (MFC)	John Fontana	john.c.fontana@lmco.com

View Online	A17-062	Multi-purpose geopolymer-basalt fiber reinforced composite	Develop a high-performance, lightweight composite material suitable for multi-use including building construction, force protection, and force projection applications.	LM Rotary and Mission Systems, Cyber, Ships and Advanced Technologies (RMS CSAT) LM Missiles and Fire Control (MFC)	Gretchen Head John Fontana	gretchen.head@lmco.com john.c.fontana@lmco.com
View Online	A17-063	Chemical, Biological, and Explosives Indicator Ticket	Demonstrate a multicomponent ticket or chit that affords a human-readable indicator response to chemical agents, protein-content, and explosive/energetic materials for presumptive field identification.	LM Rotary and Mission Systems, Cyber, Ships and Advanced Technologies (RMS CSAT)	Gretchen Head	gretchen.head@lmco.com
View Online	A17-064	Robotic Perception System for Casualty Pose Mapping	The objective of this topic is to research, develop, and demonstrate a computer vision system capable of accurate and robust geometric pose estimation for the human body that would support the use of emerging robotics and autonomous systems for applications in combat casualty care in future operational environments. This computer-vision and perception system will need to accurately determine the position and orientation of major body parts (limbs, torso, head, etc.) in real-time and be invariant to environmental conditions typically seen in the far-forward operating environments.	LM Missiles and Fire Control (MFC)	John Fontana	john.c.fontana@lmco.com
View Online	A17-065	Android and Medical App Biometric Identity and Access Management for Medic and Casualty Identification	The objective of this topic is to investigate, develop and demonstrate a biometric identity and access management capability on Android-based platforms that enable rapid authentication of medical personnel into medical devices and software, role-based access to medical personally identifiable information (PII), Health Insurance Portability and Accountability Act protection, and the rapid identification of casualties provisioned before mission execution. This research will incrementally advance the state of the art biometric mechanisms for authentication of mobile medical devices and software at the point of injury (POI), such that the final demonstration shows proof-of-concept feasibility of biometrics identity and access management in medical systems used in the operational environment.	LM Missiles and Fire Control (MFC)	John Fontana	john.c.fontana@lmco.com
View Online	A17-066	UAV/UGV Casualty Acceleration and G-Force Mission Constraint System	The objective of this topic is to research and study the effects of maneuvering/ acceleration G-Forces and altitude have on casualties during flight and ground evacuations, and develop a constraint system that will restrict and limit the vehicles movement/maneuver capabilities during casualty extraction and evacuation missions to within casualty tolerable limits. The movement/maneuver restrictions and limitations need to be established on autonomous Unmanned Systems, namely Unmanned Aerial Vehicles (UAVs) and Unmanned Ground Vehicles (UGVs) when performing Casualty Evacuation (CASEVAC) missions. Also, the preliminary research and development look at hypoxia and hypothermia effects at altitude on casualties during evacuation via a UAV.			
View Online	A17-067	Development of Novel Flexible Live Tetravalent Dengue Vaccine	Develop and characterize novel, flexible live-attenuated tetravalent vaccines against dengue capable of rapid adaptation to natural antigenic variation and generation of a dengue serotype-specific humoral cellular responses.			
View Online	A17-068	Vascular Engineering Platforms for Regenerative Medicine Manufacturing	Develop novel methods to engineer vascularized tissues for volumetrically large organs.			
View Online	A17-069	Novel Concentration Technology	Further develop and mature concentration technologies for food products to produce lower weight and volume rations with increased stability. Isolate and purify heat-sensitive health-promoting foods and compounds.			
View Online	A17-070	Compact Sanitation Center (CSC) for Expeditionary Field Feeding	Develop and demonstrate a highly expeditionary three sink sanitation system to achieve low volume pack out during transportation. Furthermore, investigate novel methods to achieve increased fuel efficiency, lower weight, and a rugged design tailored to military applications.			
View Online	A17-071	Development of Textiles to Provide Multispectural Camouflage and Concealment of Static Systems - ITAR APPLIES	The objective of this effort is to develop new tactical camouflage materials to enhance the level of protection against emerging sensor threats in support of the Ultra-Lightweight Camouflage Net System (ULCANS) Capability Development Document (CDD), approved 17 November 2015. This material will enable better concealment of heavy military equipment and platforms with a given background against a variety of sensor threats when viewed from an adversarial position. Once production is established, the material will be used in applications to cover equipment like military vehicles and shelters. It is paramount that the materials be durable enough to last in austere environmental conditions while also being flame resistant and while still providing multispectral concealment of assets compared to their background. Developed materials and prototypes will be measured for physical performance using testing methods already common to other shelter and netting systems in addition to any or all of the following: bidirectional reflectance distribution function (BRDF), directional-hemispherical reflectance (DHR) and emissivity measurements. Data from this testing may be inserted into hyperspectral modeling and simulation efforts to gauge performance.	LM Missiles and Fire Control (MFC)	John Fontana	john.c.fontana@lmco.com

View Online	A17-072	Development of a Military Hardened Expeditionary, Energy Efficient and Waterless/Low-Flow Laundry System	Military deployable laundry systems consume large amounts of water cleaning soldier uniforms, under wear, and towels. The objective of this effort is to develop an innovative, low water consumption or waterless laundry system that exhibits military hardening, conforms to existing transport and logistics requirements, and ensures military personnel can service the equipment. A low flow or waterless laundry system will allow for laundry functions at more austere locations currently constrained by limited water and fuel resupply. This in turn will increase the morale, welfare and hygiene for soldiers deployed at remote basecamps, increasing overall mission readiness and effectiveness of our Army.			
View Online	A17-073	Development of a Stochastic Multi-dimensional Fire Modeling and Simulation Software Package	The objective of this effort is to develop a multi-dimensional, computer-aided stochastic model to simulate fire behavior in military shelters. The objective of the model is to reduce the amount of destructive testing required to evaluate fire safety considerations in rigid and soft-wall military shelters.			
View Online	A17-074	Lightweight Thin-film Solar Cell with Periodic Optical Nanostructure	Investigate and develop lightweight, thin-film solar cells coupled to periodic optical nanostructures that can scale up to large-area, low-cost modules deployed by the military for extended missions. The periodic optical nanostructure should enhance power conversion efficiency by light-trapping, reducing overheating, and/or other mechanisms.	LM Rotary and Mission Systems, Cyber, Ships and Advanced Technologies (RMS CSAT) LM Space Systems - SMD	Gretchen Head Jeff Bowers	gretchen.head@lmco.com jeff.bowers@lmco.com
View Online	A17-075	Fire Retardant Nylon Yarn	Develop a method to impart flame protection to Nylon 6,6 textile fiber/yarn used to fabricate the Army Combat Uniform (ACU).			
View Online	A17-076	Low Profile Strain Measurement System for Parachute Suspension Lines	Develop and demonstrate innovative materiel solutions for Army parachutes to measure forces exerted on individual suspension and control lines during the challenging airdrop environment			
View Online	A17-077	On Board Strain Measurement System for Ballistic and Ram-Air Parachute Canopies	Develop an instrumentation system to measure and record the on-board continuous strain field in a parachute canopy during inflation and once it is fully inflated			
View Online	A17-078	3D Food Printing Control System	Develop and demonstrate a controllable 3D food printer incorporating an effective paste-delivery system with positive displacement technology (such as by pneumatic, peristaltic or progressive cavity pumps). This system must be food-grade and enable smooth printing of multicomponent consumable items, without clogging/fouling of the print head. System interface must be sufficiently user-friendly such that an untrained Soldier could operate the printer.	LM Missiles and Fire Control (MFC)	John Fontana	john.c.fontana@lmco.com
View Online	A17-079	Innovative technologies that optimize the range of mortar systems	Develop Innovative technologies and/or methodologies that optimize the range and precision of current US mortar systems focusing on propulsion energy and aerodynamics.	LM Missiles and Fire Control (MFC) LM Space Systems - SMD	John Fontana Jeff Bowers	john.c.fontana@lmco.com jeff.bowers@lmco.com
View Online	A17-080	Application of Additive Manufacturing Technologies to Produce Entire Munitions	Develop innovative additive manufacturing (AM) technologies and/or processes that that will produce a full-up munition.	LM Missiles and Fire Control (MFC)	John Fontana	john.c.fontana@lmco.com
View Online	A17-081	Biogenic Process for converting propellants and energetics into usable byproducts (such as biofuel)	Develop an innovative industrial scale biogenic process to convert propellants and/or energetics into usable byproducts such as biofuel.			
View Online	A17-082	Reusable Pilot Vehicle Interface (PVI) Components and Widgets using ARINC 661 and FACE Architectures	Design and demonstrate rapid and agile component development technologies for graphical reuse in modular avionics architectures, incorporating emerging standards-based avionics approaches such as ARINC 661, Future Airborne Capabilities Environment (FACE), Unmanned Aerial Systems (UAS) Control Segment (UCS), Integrated Modular Avionics (IMA), Hardware Open Systems Technologies (HOST), Open Mission Systems (OMS), Joint Common Architecture (JCA), System of Systems Architecture (SOSA), and/or other standards for reusable avionics.	LM Rotary and Mission Systems, Cyber, Ships and Advanced Technologies (RMS CSAT)	Gretchen Head	gretchen.head@lmco.com
View Online	A17-083	Advanced High Speed Scalable Dense Memory Payload for Army Group UAS	Develop a High capacity and low mass/volume non-volatile Solid State Disk (SSD) of 100s of Terabyte Capacity in order to record high-resolution video for multiple hour-long missions. The multi Terabyte SSD will be designed to interface with Unmanned Aerial System Payloads (EO/IR/Multi Spectral) as well as Ground Control Video and Data Processing Systems.			
View Online	A17-085	Remote Radio Antennas for Command Posts	Develop material solution that will facilitate moving Brigade and Battalion command post RF emitters/antennas elements a sufficient distance away from the supported command post in order to increase survivability against indirect fire without significant degradation of communication systems performance.	LM Space Systems - SMD	Jeff Bowers	jeff.bowers@lmco.com
View Online	A17-087	Real-time Wastewater Analyzer	Optimize Army water management by developing a smart control algorithm system that uses water quality measurements to classify wastewater.	LM Missiles and Fire Control (MFC)	John Fontana	john.c.fontana@lmco.com
View Online	A17-088	Advanced Pretreatment for Greywater Reuse	Under this topic, the Government invites proposals for the development and demonstration of an advanced pretreatment for greywater (shower & laundry), prior to reverse osmosis, in an expeditionary greywater reuse system.	LM Rotary and Mission Systems, Integrated Warfare Systems & Sensors (RMS IWSS)	Rebecca Gerskhovich	rebecca.gershkovich@lmco.com

View Online	A17-089	Low Flow Rate Energy Recovery	Under this topic, the Government invites proposals for the development and demonstration of a light weight low flow rate energy recovery module for enabling technology for the development of a small, man portable, sea water reverse osmosis water purification system.	LM Rotary and Mission Systems, Integrated Warfare Systems & Sensors (RMS IWSS)	Rebecca Gerskhovich	rebecca.gershkovich@lmco.com
View Online	A17-090	Portable, Fieldable Method to Repair and Join Currently Non-Weldable Aluminum Alloys	To develop and demonstrate an innovative in-field repair and joining method for non-weldable aluminum alloys.	LM Missiles and Fire Control (MFC) LM Rotary and Mission Systems, C4 & Undersea Systems (RMS C4USS)	John Fontana Michael Weingarten	john.c.fontana@lmco.com michael.weingarten@lmco.com
View Online	A17-091	Vibration & Pressure Reducing, Soldier Health Seat Cushion Padding	Develop a seat cushion that will mitigate vibration transferred to the Soldier during dynamic vehicle missions and provide even pressure distribution to aid in blood flow circulation of the legs while in the seated position. Soldiers must be mission ready at all times and in good health after long hours in Military vehicles.	LM Missiles and Fire Control (MFC)	John Fontana	john.c.fontana@lmco.com
View Online	A17-092	Materials with Wideband Transmissivity	Design and develop a material solution for wide-band lasers that has at least 80% transmissivity across the electromagnetic spectrum between 300nm 8500nm when the incident angle of light is perpendicular to the material plane. Optical coatings can be used to meet this bandwidth requirement. This material must be manufacturable enough to be grown/machined into a hemispherical dome and must be durable enough to endure dripping water as described in MIL-STD-810, Method 506.5, endure icing conditions/freezing rain as described in MIL-STD-810G, endure immersion in salt water at a depth of 1 meter for a period not greater than five (5) seconds as described in MIL-STD-810G Method 512.5, and operate in a temperature range between -54C to +71C. The Phase II shall conclude in a test that measures the listed specifications, and a hardware deliverable is required along with the report.	LM Missiles and Fire Control (MFC) LM Space Systems - SMD	John Fontana Jeff Bowers	john.c.fontana@lmco.com jeff.bowers@lmco.com
View Online	A17-093	Optically Transparent Near-Perfect Microwave Absorber	The Army has interest in finding innovative ways to manipulate and control as much of the electromagnetic spectrum as possible. The objective of this effort is directed primarily at finding a material that absorbs radio-frequency (RF) waves while remaining transparent in the visible and at near- and mid-IR frequencies.	LM Missiles and Fire Control (MFC)	John Fontana	john.c.fontana@lmco.com
View Online	A17-094	Seeker Dome Optical Correction for Non-Hemispherical Shapes	Missile seeker dome design is generally a trade-off between minimizing drag for aerodynamics and maximizing seeker sensor performance. Designing for minimal drag creates challenges for visible and infrared imaging seekers due to the optical distortion created by the shape of the dome. The objective of this effort is to develop an optical device to correct for the distortions created by a non-hemispherical dome throughout the full field of regard of the sensor.	LM Missiles and Fire Control (MFC) LM Space Systems - SMD	John Fontana Jeff Bowers	john.c.fontana@lmco.com jeff.bowers@lmco.com
View Online	A17-095	Cluster UAS Smart Munition for Missile Deployment	Develop a cluster payload which can be launched and deployed from a GMLRS or ATACMS platform. The payload shall consist of multiple deployable smart quad-copters capable of delivering small explosively formed penetrators (EFP) to designated targets.	LM Missiles and Fire Control (MFC)	John Fontana	john.c.fontana@lmco.com
View Online	A17-096	Tactical Wireless Gigabit (WiGig) for Dismounted Soldier Sensor Applications	Demonstrate for the first time a low power, low latency, and high bandwidth WiGig (60 Ghz band) wireless data link to support intra-Soldier transmission of high definition sensor imagery.			
View Online	A17-097	Cognitive Heterogeneous Adaptive Operational System (CHAOS)	The Offeror shall define, develop, and demonstrate a system/device that provides wireless commercial throughput rates, resistance to system and/or artificial interference, and a low probability of interception and detection in an operational environment.			
View Online	A17-098	Squad-level Technology to Detect and Counter UAS (Unmanned Aircraft Systems)	To provide each squad with the technology required to detect and disrupt/destroy UAS threats, attacks, and maneuvers. This SBIR will investigate and validate novel concepts, methods, and technology to establish overmatch against this emerging threat before the gap is realized. This effort has not been explored before at the squad and platoon level threat.	LM Missiles and Fire Control (MFC) LM Rotary and Mission Systems, Integrated Warfare Systems & Sensors (RMS IWSS)	John Fontana Rebecca Gerskhovich	john.c.fontana@lmco.com rebecca.gershkovich@lmco.com
View Online	A17-099	Intelligent Tutor as a Service	The objective is to develop innovative methods and software tools to provide a services based approach for an intelligent tutoring capability as a capability in a service oriented architecture. This functionality must provide tutoring as a reusable service that can be used by a variety of capabilities and devices.			
View Online	A17-100	Human-Type Target (HTT) Articulation	Develop a Human Type Target (HTT) that increases realism (realistic portrayal of threat, threat escalation, and threat reduction), durability and usability in the Urban Operations (UO) Training environment. An HTT is a stationary, physical, three dimensional, full body target designed to realistically portray a human being.			
View Online	A17-101	Network-Enabled Casualty Treatment Trainers	Provide network-enabled casualty treatment device simulators for first-aid / buddy-aid during live training exercises.			
View Online	A17-102	Advanced UAV and Mortar Target Detection and Tracking Algorithms for Low Signal-to-Noise Ratio and Cluttered Environments	To develop advanced image processing algorithms for the detection and tracking of small Unmanned Aerial Vehicles (UAVs) and Mortars in low Signal-to-Noise Ratio (SNR) and cluttered environments.	LM Missiles and Fire Control (MFC) LM Space Systems - SMD	John Fontana Jeff Bowers	john.c.fontana@lmco.com jeff.bowers@lmco.com

View Online	A17-103	Low-Cost Reduced Size, Weight and Power RF Sensor for Short-Range Target Tracking in Degraded Visual Environments	To develop low-cost man-portable RF sensors with reduced Size, Weight and Power consumption (SWaP) for short-range target tracking in degraded visual environments in support of mobile Army tactical platforms.	LM Missiles and Fire Control (MFC) LM Rotary and Mission Systems, Integrated Warfare Systems & Sensors (RMS IWSS) LM Space Systems - SMD	John Fontana Rebecca Gershkovich Jeff Bowers	john.c.fontana@lmco.com rebecca.gershkovich@lmco.com jeff.bowers@lmco.com
View Online	A17-104	Variable Pulsed Parameter Tracking Illuminator Laser	To design and build a prototype pulsed laser in the 1550 nm wavelength region with variable pulse parameters of 500 Hz to 5 kHz and 50 mJ to 300 mJ. The pulse parameters shall be met such that the average power ranges between 150 and 250 Watts, or the 300 mJ pulse at 500 Hz and 50 mJ pulse at 5 kHz. The prototype laser must prove design capability.	LM Rotary and Mission Systems, Cyber, Ships and Advanced Technologies (RMS CSAT) LM Space Systems LM Missiles and Fire Control (MFC) LM Space Systems - SMD	Gretchen Head Jesus Isarraras John Fontana Jeff Bowers	gretchen.head@lmco.com jesus.isarraras@lmco.com john.c.fontana@lmco.com jeff.bowers@lmco.com
View Online	A17-105	Bridge Launch Technology for Ultra Lightweight Combat Vehicles	To develop bridge launch technology which can be adapted to ultra-lightweight combat vehicle platforms to enable them to defeat gaps which may be encountered during their missions.	LM Missiles and Fire Control (MFC)	John Fontana	john.c.fontana@lmco.com
View Online	A17-106	Integration of variable fidelity models for designing ground vehicle systems	To develop a design methodology and a system performance evaluation tool, that considers the credibility of the variable fidelities of the models used, in order to assess its holistic performance of various, often disparate system attributes.	LM Missiles and Fire Control (MFC)	John Fontana	john.c.fontana@lmco.com
View Online	A17-107	Systematic trade-off strategies for balancing survivability and mobility in vehicle design	An automated systematic tradeoff tool for balancing several alternative considerations of survivability with mobility for advanced vehicle design	LM Missiles and Fire Control (MFC)	John Fontana	john.c.fontana@lmco.com
View Online	A17-108	Lightweight Durable Bridge Decking	To develop a lightweight durable bridge decking solution which is rapidly deployable and withstands the loading of a medium unmanned ground vehicle and one Soldier operator.			
View Online	A17-109	Occupant Ejection Mitigation Technology	Develop a new technology solution to increase occupant survivability and decrease risk of ejection for occupants standing in an ingress/egress hatch opening as part of operational duty in a ground vehicle while experiencing an Improvised Explosive Device (IED) underbody blast event.	LM Missiles and Fire Control (MFC)	John Fontana	john.c.fontana@lmco.com
View Online	A17-110	Quiet Tracked Vehicle Vibration Reduction focused Road Wheel	Develop a road wheel concept with the focus of the road wheel rubber acting as a bushing to reduce high frequency vibration transfer to the road arm. The potential improvement could affect external acoustic signature reduction, interior noise level reduction, and improve rubber heat dissipation. These are all byproducts of the road wheel loading occurred at the track-road wheel interaction.	LM Missiles and Fire Control (MFC)	John Fontana	john.c.fontana@lmco.com
View Online	A17-111	Tailored Adhesives for High-Strain-Rate Applications	The Army is looking to develop technologies that would provide lightweighting opportunities for current and future vehicles. Adhesive materials present two potential opportunities for lightweighting; use of an adhesive may reduce the number of bolts needed for a mechanically joined component, and adhesives may open the possibility for multi-material joints allowing for the incorporation of lighter-weight materials. To meet these opportunities, prospective adhesive materials would need to perform satisfactorily in very high strain rate loading situations like a blast event or under ballistic	LM Aeronautics (Aero) LM Missiles and Fire Control (MFC) LM Space Systems - SMD	Craig Owens John Fontana Jeff Bowers	craig.l.owens@lmco.com john.c.fontana@lmco.com jeff.bowers@lmco.com
View Online	A17-112	High efficiency torque multiplication for military ground vehicle transmission	Development of a technology capable of torque multiplication through conservation-of-energy and speed reduction operation. This capability is sought to address the energy inefficiency of existing torque converter transmissions in ground vehicle transmissions.			
View Online	A17-113	Low Cost, Solid-State Scanning Lidar	To provide a compact, affordable, and reliable high resolution Lidar system which is invisible to night vision goggles and provides real-time beam configuration for improved autonomous capabilities.	LM Space Systems LM Missiles and Fire Control (MFC) LM Space Systems - SMD	Jesus Isarraras John Fontana Jeff Bowers	jesus.isarraras@lmco.com john.c.fontana@lmco.com jeff.bowers@lmco.com
View Online	A17-114	Nondestructive Characterization of Transparent Armor	Develop an apparatus to characterize transparent armor through nondestructive mechanisms	LM Missiles and Fire Control (MFC) LM Space Systems - SMD	John Fontana Jeff Bowers	john.c.fontana@lmco.com jeff.bowers@lmco.com
View Online	A17-115	Adaptive Armor Actuator Mechanisms	Develop and demonstrate a model for a mechanism capable of moving an armor panel of at least 1 square foot with an areal density of 100 pounds per square foot (PSF) 10 horizontally in less than 5 seconds. The movement is intended to be repeatable and controlled from the interior of the vehicle and shall not pose harm to dismounted personnel.	LM Missiles and Fire Control (MFC)	John Fontana	john.c.fontana@lmco.com
View Online	A17-116	Field Instrumentation to measure, quantify, and characterize fuel contaminants	Develop a portable instrument to rapidly detect, measure, quantify, and characterize solid particulate and free water contamination in aviation fuel.	LM Rotary and Mission Systems, C4 & Undersea Systems (RMS C4USS)	Michael Weingarten	michael.weingarten@lmco.com
View Online	AF171-001	Variable Pressure/Flow Control Firefighting Nozzle	Develop a hose-end nozzle system capable of allowing the operator to hand select discharges of Ultrahigh-Pressure (UHP; 1100 to 1500 PSI @ 15 to 20 GPM) and low-pressure (LP; 100 PSI @ 15 to 20 GPM) water streams at variable flow rates through a single hose line and application nozzle.			
View Online	AF171-002	Wide-angle Retroreflectometer	A hand\held system that fits light\tight over reflective beads marking runway surfaces and measures light intensity reflected at angles from 0C45 from a beam incident at 0C45 degrees and displaced 0C30 degrees from the reflected beam.			
View Online	AF171-003	Alternative Method of Surface Activation of High Strength Steels for Electroplating	Develop a surface activation technology for electroplating landing gear parts that shall reduce the amount of material removed from the parts, improve plating adhesion, reduce waste, and lower risks to both personnel & landing gear parts.	LM Missiles and Fire Control (MFC)	John Fontana	john.c.fontana@lmco.com

View Online	AF171-004	Electroplating 3D Printed Materials	Research and develop an appropriate process to include specifications, equipment requirements, optimal applications and cost/benefit for metal plating 3D Fused Deposition Modeling (FDM) and Stereo Lithography (SLA) printed parts.	LM Missiles and Fire Control (MFC) LM Rotary and Mission Systems, C4 & Undersea Systems (RMS C4USS) LM Space Systems - SMD	John Fontana Michael Weingarten Jeff Bowers	john.c.fontana@lmco.com michael.weingarten@lmco.com jeff.bowers@lmco.com
View Online	AF171-005	F-16 Landing Gear Bushing Bore Repair	The purpose of this task is to provide engineering services to develop tooling, procedures, training materials, and drawings to repair all landing gear attachment housing holes.	LM Missiles and Fire Control (MFC)	John Fontana	john.c.fontana@lmco.com
View Online	AF171-006	Development of Additive Manufacturing for Landing Gear Components	Research and develop Additive Manufacturing (AM) technologies for landing gear components to enable testing and production of landing gear components using AM techniques.	LM Aeronautics (Aero) LM Missiles and Fire Control (MFC)	Craig Owens John Fontana	craig.l.owens@lmco.com john.c.fontana@lmco.com
View Online	AF171-007	Real-time, 3-D Model Deformation Measurement Capability for Perforated Wall Wind Tunnels	Develop an accurate, real-time, 3-D capability for the quantitative measurements of position, attitude, and surface deformation of test models in large scale wind tunnels.			
View Online	AF171-008	Reduction/Elimination of Unsteady Aerodynamic Loads on Model and Balance Support Systems in Large Scale Wind Tunnels	Develop a technology for effective damping or elimination of large oscillations in wind tunnel model balance support systems.			
View Online	AF171-009	Miniature Video Camera Technology for Embedded Probes	Development of a miniature video camera technology with the appropriate form factor and optical performance for embedding into small water-cooled probes for evaluating and monitoring turbine engine augmentor performance.	LM Space Systems - SMD	Jeff Bowers	jeff.bowers@lmco.com
View Online	AF171-010	Non-Intrusive, Time-Resolved Turbulence Measurements in Large-Scale Hypersonic Wind Tunnels	Develop and validate a non-intrusive, time-resolved instrument for turbulence measurements in large hypersonic ground test facilities.	LM Missiles and Fire Control (MFC)	John Fontana	john.c.fontana@lmco.com
View Online	AF171-011	Advanced, Low-Erosion Electrode Technologies for Arcjet Testing	Develop advanced, cost-effective, arc-heater electrode materials and demonstrate significant reduction in erosion rates under typical operating conditions as compared to traditional electrode materials.			
View Online	AF171-012	Air to Ground Target System for Engineering Based Airborne Electro-Optics Imaging System Performance	Develop a ground based target system to enable measurement of sensitivity and spatial resolution of airborne target sensors with long range and full optical spectrum capability.	LM Missiles and Fire Control (MFC) LM Space Systems - SMD	John Fontana Jeff Bowers	john.c.fontana@lmco.com jeff.bowers@lmco.com
View Online	AF171-013	Next Gen Infrared Emitter Array Packaging	Develop a robust, scalable packaging and cooling solution for next generation infrared emitter arrays.	LM Missiles and Fire Control (MFC) LM Space Systems - SMD	John Fontana Jeff Bowers	john.c.fontana@lmco.com jeff.bowers@lmco.com
View Online	AF171-014	Dynamic Aircraft Tire Footprint Sensor (DATFS)	Develop a dynamic aircraft tire measurement system capable of tire footprint property measurement; integrated with internal drum dynamometer. Support aircraft loads and speeds with continuous measurements of all types of tire footprint properties.			
View Online	AF171-015	Infrared Light Emitting Diode Extraction Efficiency	Develop technologies to improve extraction efficiency of high density infrared light emitting diode arrays to improve radiance output, self-heating, and wall-plug efficiency.			
View Online	AF171-016	Efficient On-Board Fire Suppression	Efficiently and economically suppress on-board aircraft fires using a non-toxic and non-corrosive agent while balancing cost/logistics burdens.			
View Online	AF171-017	Low Cost High Sensitivity Superconducting Magnetometers and Gradiometers	Develop low cost, high sensitivity magnetometers and gradiometers utilizing direct-write, high-transition-temperature superconducting nano-Josephson junction SQUIDs.	LM Missiles and Fire Control (MFC) LM Rotary and Mission Systems, Integrated Warfare Systems & Sensors (RMS IWSS) LM Space Systems - SMD	John Fontana Rebecca Gershkovich Jeff Bowers	john.c.fontana@lmco.com rebecca.gershkovich@lmco.com jeff.bowers@lmco.com
View Online	AF171-018	Gallium Oxide Homo/Hetero-Epitaxial Structures for RF and Power Switching Devices	Develop and demonstrate Beta-Gallium Oxide (ß-Ga2O3) epitaxial structures suitable for fabrication of Metal Oxide Semiconductor Field Effect Transistor (MOSFET) and High Electron Mobility Transistor (HEMT) devices.	LM Missiles and Fire Control (MFC) LM Space Systems - SMD	John Fontana Jeff Bowers	john.c.fontana@lmco.com jeff.bowers@lmco.com
View Online	AF171-019	High-Speed Wind Tunnel Transient Dynamics During Start-up	Mitigate risk to high speed aerospace ground test facilities and test articles during wind tunnel startup.			
View Online	AF171-020	Instrumentation for carbon-carbon structures in extreme environments	Develop and validate, through testing, a methodology to integrate pressure, acoustic, and temperature (from which heat flux may be derived) sensors for carbon-carbon structures to be used as test articles in arc jet facilities.	LM Space Systems - SMD	Jeff Bowers	jeff.bowers@lmco.com
View Online	AF171-021	Ultradense Plasmonic Integrated Devices and Circuits	Develop ultradense, low-power plasmonic integration components and devices for future battlefield sensors and systems.	LM Missiles and Fire Control (MFC)	John Fontana	john.c.fontana@lmco.com
View Online	AF171-022	Advanced back-illuminated CMOS image sensors for adaptive optics applications	Develop a high-speed, low-noise scientific camera using a back-illuminated silicon CMOS image sensor capable of operating at high quantum efficiency (>80%) without the use of microlenses for use in advanced adaptive optics applications.	LM Rotary and Mission Systems, Cyber, Ships and Advanced Technologies (RMS CSAT) LM Space Systems LM Space Systems - SMD	Gretchen Head Jesus Isarraras Jeff Bowers	gretchen.head@lmco.com jesus.isarraras@lmco.com jeff.bowers@lmco.com
View Online	AF171-023	Adaptive Optics Prototype for a Meter-class Telescope used for Space Surveillance	Build and demonstrate an adaptive optics prototype which can be deployed at 1 m class telescopes for the Space Surveillance Network (SSN) to accomplish characterization of Low Earth Orbit (LEO) objects and area inspection around high value assets at Geosynchronous Earth Orbit (GEO).	LM Space Systems LM Space Systems - SMD	Jesus Isarraras Jeff Bowers	jesus.isarraras@lmco.com jeff.bowers@lmco.com
View Online	AF171-024	Daylight Glare Reduction Using a Light-field Camera	Improve glare reduction/rejection in daylight satellite tracking operations caused by close proximity to the Sun, reducing the exclusion angle around the Sun.	LM Missiles and Fire Control (MFC) LM Space Systems - SMD	John Fontana Jeff Bowers	john.c.fontana@lmco.com jeff.bowers@lmco.com

View Online	AF171-025	Realtime Multiframe Blind Deconvolution (MFBD) for Imaging through Turbulence	Develop a standalone processing unit that applies a multiframe blind deconvolution (MFBD) algorithm to an input stream of live, turbulence-degraded satellite imagery. Corrected image estimates should be displayed to the user in real-time.	LM Space Systems LM Missiles and Fire Control (MFC)	Jesus Isarraras John Fontana	jesus.isarraras@lmco.com john.c.fontana@lmco.com
View Online	AF171-026	24/7 Monitoring of Active Satellites using Passive Radio-Frequency (RF) Sensors	Deliver a passive radio-frequency sensor for maintaining track custody and unique identification of actively RF-emitting satellites from low-earth orbit (LEO) to geosynchronous orbit (GEO) 24 hours per day through cloud cover with reasonable cost.	LM Missiles and Fire Control (MFC) LM Rotary and Mission Systems, Integrated Warfare Systems & Sensors (RMS IWSS)	John Fontana Rebecca Gerskhovich	john.c.fontana@lmco.com rebecca.gershkovich@lmco.com
View Online	AF171-027	Cyber warfare laboratory design	Development and demonstration of cyber warfare laboratory.	LM Rotary and Mission Systems, Cyber, Ships and Advanced Technologies (RMS CSAT) LM Space Systems LM Missiles and Fire Control (MFC) LM Rotary and Mission Systems, Integrated Warfare Systems & Sensors (RMS IWSS)	Gretchen Head Jesus Isarraras John Fontana Rebecca Gerskhovich	gretchen.head@lmco.com jesus.isarraras@lmco.com john.c.fontana@lmco.com rebecca.gershkovich@lmco.com
View Online	AF171-028	Cyber Attack model using game theory	Development and demonstration of a Cyber Attack model using game theory.	LM Rotary and Mission Systems, Cyber, Ships and Advanced Technologies (RMS CSAT) LM Space Systems LM Missiles and Fire Control (MFC) LM Rotary and Mission Systems, Integrated Warfare Systems & Sensors (RMS IWSS)	Gretchen Head Jesus Isarraras John Fontana Rebecca Gerskhovich	gretchen.head@lmco.com jesus.isarraras@lmco.com john.c.fontana@lmco.com rebecca.gershkovich@lmco.com
View Online	AF171-029	Training for Cyber Operations	Develop interactive and immersive training Simulator for Cyber Weapon Systems.	LM Rotary and Mission Systems, Cyber, Ships and Advanced Technologies (RMS CSAT) LM Rotary and Mission Systems, Integrated Warfare Systems & Sensors (RMS IWSS)	Gretchen Head Rebecca Gerskhovich	gretchen.head@lmco.com rebecca.gershkovich@lmco.com
View Online	AF171-030	Battlefield Airmen Augmented Reality System (BAARS)	Develop a low-latency multispectral digital helmet-mountable near-to-eye augmented reality system for use by Battlefield Airmen. System must be capable of use to aid vision in night, day, and all-weather operations.	LM Missiles and Fire Control (MFC)	John Fontana	john.c.fontana@lmco.com
View Online	AF171-031	Wearable, Broadband, EM Field Exposure Detection System with Data Sharing Capability	Develop a real-time, wearable battlefield radio frequency field detection system to monitor human exposure to harmful EM fields, notify the wearer, broadcast exposure information for command and control, and improve battlespace situational awareness.	LM Missiles and Fire Control (MFC) LM Rotary and Mission Systems, Integrated Warfare Systems & Sensors (RMS IWSS)	John Fontana Rebecca Gerskhovich	john.c.fontana@lmco.com rebecca.gershkovich@lmco.com
View Online	AF171-032	Wearable Device to Characterize Chemical Hazards for Total Exposure Health	Develop modular wearable instrument that incorporates real-time sensor and collection technologies for volatiles and aerosols to monitor frequency, magnitude, and chemical make-up of contaminants to understand risks to Total Exposure Health (TEH).	LM Missiles and Fire Control (MFC) LM Space Systems - SMD	John Fontana Jeff Bowers	john.c.fontana@lmco.com jeff.bowers@lmco.com
View Online	AF171-033	Mobile activity tracking system for field training and exercise assessment	Develop precise system to track personnel location and activity during indoor and outdoor ground-based training.			
View Online	AF171-034	Simulator Common Architecture Requirements and Standards (SCARS)	Develop a benchmark simulator training system architecture that is sustainable in a dynamic cyber security environment.			
View Online	AF171-035	Data Growth Within the Air Force Weather Enterprise	Reduce impact of expected data growth on the Air Force Weather (AFW) Enterprise by exploring ways of focusing on specific areas of interest for the high-resolution data.			
View Online	AF171-036	Energy Efficient Technologies for Tactical Communications and Networking (E2-COMS)	Develop highly-efficient power and power conservation technologies for extended ground-to-ground and ground-to-air/air-to-ground battlespace communications.	LM Rotary and Mission Systems, C4 & Undersea Systems (RMS C4USS)	Michael Weingarten	michael.weingarten@lmco.com
View Online	AF171-037	Mission Assured Authentication (MAA)	Provide war fighter with the ability to confirm distant end communicator (person/device) is the intended person/device with whom the warfighter is communicating. If not, render the distant node inoperative and/or disconnected from the aerial network.	LM Missiles and Fire Control (MFC) LM Rotary and Mission Systems, Integrated Warfare Systems & Sensors (RMS IWSS)	John Fontana Rebecca Gerskhovich	john.c.fontana@lmco.com rebecca.gershkovich@lmco.com
View Online	AF171-038	High-Throughput High-Frequency (HTHF) Battle Management Command-Control (BMC2)	Utilizing High-Throughput High-Frequency (HF) or "next generation" HF advanced communications, provide innovative nuclear command-control-communications and global strike C2 and situation awareness (SA); enhance oceanic flight following and tracking.	LM Space Systems LM Rotary and Mission Systems, C4 & Undersea Systems (RMS C4USS)	Jesus Isarraras Michael Weingarten	jesus.isarraras@lmco.com michael.weingarten@lmco.com
View Online	AF171-039	Data Protection and Sharing Technologies In Critical Key Networks and for Cyber Defense of Weapons (DPSTICK)	Develop efficient data protection and sharing technologies for Airborne Networks.	LM Rotary and Mission Systems, Integrated Warfare Systems & Sensors (RMS IWSS)	Rebecca Gerskhovich	rebecca.gershkovich@lmco.com
View Online	AF171-040	Aerial Cloud Analytics for Strategic and Tactical Warfighting (ACAST)	Provide responsive information to conventional and strategic warriors at the tactical edge, and to the planners and decision makers governing the conduct of critical air and surface warfare operations. Develop data analytics tools and techniques.	LM Space Systems	Jesus Isarraras	jesus.isarraras@lmco.com
View Online	AF171-041	Aerial Cloud Computing Technologies (ACCT)	Develop technologies to enable aerial tactical cloud capable of in-mission processing and storage of large data using computing resources distributed across multiple aerial platforms and surface platforms (e.g., ships and ground vehicles)	LM Rotary and Mission Systems, Integrated Warfare Systems & Sensors (RMS IWSS)	Rebecca Gerskhovich	rebecca.gershkovich@lmco.com
View Online	AF171-042	Big Data Cyber Analytics	Develop log-based Big Data cyber analytics that reveal anomalous behaviors in networks.	LM Rotary and Mission Systems, Cyber, Ships and Advanced Technologies (RMS CSAT) LM Space Systems LM Missiles and Fire Control (MFC)	Gretchen Head Jesus Isarraras John Fontana	gretchen.head@lmco.com jesus.isarraras@lmco.com john.c.fontana@lmco.com
View Online	AF171-043	Mobile User Objective System (MUOS) for Moderate Data Rate Communications (MMDR)	Provide means to port MUOS waveform for receive only and transmit-receive in multiple aerial platforms; develop/modify BMC2 and SA applications to support employment by strategic and tactical users.	LM Space Systems	Jesus Isarraras	jesus.isarraras@lmco.com
View Online	AF171-044	Mobile Authentication and Access Capability	To simplify and strengthen the Battlefield Airman Operations Kit authentication and authorization procedures in order to enable rapid and reliable access to combat critical information.	LM Missiles and Fire Control (MFC)	John Fontana	john.c.fontana@lmco.com

View Online	AF171-045	Automatic Dependent Surveillance - Broadcast (ADS-B) and UAS operations	Develop a cost effective approach to enable the safe and effective incorporation of UAV operations within the National Airspace System (NAS) while leveraging advancements made under the Federal Aviation Administration's (FAA) 2020 mandate for ADS-B transmission capability.	LM Rotary and Mission Systems, Cyber, Ships and Advanced Technologies (RMS CSAT)	Gretchen Head	gretchen.head@lmco.com
View Online	AF171-046	3rd Party Intellectual Property (I V&V Effort)	Prototype a 3rd Party Intellectual Property verification and validation software system against a UART or similar complexity IP block. This effort will develop and evaluate an innovative software system for the V&V of a discrete IP block.	LM Missiles and Fire Control (MFC)	John Fontana	john.c.fontana@lmco.com
View Online	AF171-047	Resilient Communications for Contested Autonomous Manned/Unmanned Teaming	Develop communications capabilities for next generation platforms to perform manned/unmanned teaming operations with semi autonomous for C2, flight control, shared situational awareness, extended sensor/electronic warfare/communications, targeting, and employment of weapons.	LM Rotary and Mission Systems, Cyber, Ships and Advanced Technologies (RMS CSAT) LM Space Systems LM Rotary and Mission Systems, C4 & Undersea Systems (RMS C4USS)	Gretchen Head Jesus Isarraras Michael Weingarten	gretchen.head@lmco.com jesus.isarraras@lmco.com michael.weingarten@lmco.com
View Online	AF171-048	Big Data Analytics for Activity Based Intelligence	Overcome the Big Data challenges of analyzing multi-int data to enable scalable analytics for Activity Based Intelligence.	LM Rotary and Mission Systems, Cyber, Ships and Advanced Technologies (RMS CSAT) LM Space Systems LM Missiles and Fire Control (MFC) LM Space Systems - SMD	Gretchen Head Jesus Isarraras John Fontana Jeff Bowers	gretchen.head@lmco.com jesus.isarraras@lmco.com john.c.fontana@lmco.com jeff.bowers@lmco.com
View Online	AF171-049	Collective Human Intelligence as Exploitation Layer in Automated Information Systems	Develop collaborative/collective intelligence system where human interaction is independent but cooperative with autonomous analytics for information exploitation.	LM Missiles and Fire Control (MFC)	John Fontana	john.c.fontana@lmco.com
View Online	AF171-050	Human-Machine Collaboration for Automated Patterns of Life Analysis	Develop a fully interactive system that encourages human-machine collaboration for Patterns of Life analysis over multi-modal data.			
View Online	AF171-051	Elevated Situational Awareness through Discovery and Characterization of Composable Free Market Analytics	Develop a modular, secure solution for analytics across multiple domains to be autonomously represented, characterized, and discovered for bandwidth-optimized summarization, transfer, evaluation, and tasking.	LM Rotary and Mission Systems, Integrated Warfare Systems & Sensors (RMS IWSS)	Rebecca Gerskhovich	rebecca.gershkovich@lmco.com
View Online	AF171-052	Non Intrusive Passive Optics/Imaging for Damage Prediction and Structural Health Monitoring in Gas Turbines	Develop conceptual approaches that assess component degradation, flaws, and anomalies; the approaches use advanced sensors and image analysis that overcome current nondestructive inspection (NDI) limitations with real-time optical and electromagnetic sensors and algorithms.	LM Rotary and Mission Systems, Cyber, Ships and Advanced Technologies (RMS CSAT) LM Space Systems LM Rotary and Mission Systems, C4 & Undersea Systems (RMS C4USS)	Gretchen Head Jesus Isarraras Michael Weingarten	gretchen.head@lmco.com jesus.isarraras@lmco.com michael.weingarten@lmco.com
View Online	AF171-053	Extrapolating Useful Life from Composite Structures Using In-Service Data	Directly mapping full ultrasonic c-scan 3D datasets to 3D models. Identify and size anomalies to allow comparison with previously stored images of the same asset at a previous inspection.	LM Aeronautics (Aero)	Craig Owens	craig.l.owens@lmco.com
View Online	AF171-054	Non-GPS Relative Navigation for Remotely Piloted Aircraft (RPA) Refueling	This topic is intended to develop relative navigation technology needed for the refueling of remotely piloted aircraft (RPA) in an environment where a GPS signal is unavailable due to signal jamming or satellite disruption.	LM Missiles and Fire Control (MFC) LM Rotary and Mission Systems, Integrated Warfare Systems & Sensors (RMS IWSS)	John Fontana Rebecca Gerskhovich	john.c.fontana@lmco.com rebecca.gershkovich@lmco.com
View Online	AF171-055	Fast High Resolution, High Contrast Microfocus X-Ray Computed Tomography Reconstruction Algorithms for ICBM Components	Develop algorithms, software and computer system that eliminate artifacts, enhance image quality and improve speed of microfocus cone-beam computed tomography applied to nondestructive testing of small components in ICBM systems.	LM Space Systems LM Missiles and Fire Control (MFC) LM Space Systems - SMD	Jesus Isarraras John Fontana Jeff Bowers	jesus.isarraras@lmco.com john.c.fontana@lmco.com jeff.bowers@lmco.com
View Online	AF171-056	Fiber Optic Sensing Systems (FOSS) for Expendable Launch Vehicles	Precision FOSS health monitoring system to augment or replace legacy instrumentation systems on expendable launch vehicles.	LM Space Systems - SMD	Jeff Bowers	jeff.bowers@lmco.com
View Online	AF171-057	Dynamic and Efficient Vapor Compressor for Aircraft Thermal Management Systems (TMSs)	To develop and demonstrate an approximately 125 to 150 kW nominal capacity, dynamically responsive refrigerant vapor compressor which can sustain high efficiency over a range of turn-downs for next-generation aircraft thermal management systems (TMS).	LM Space Systems - SMD	Jeff Bowers	jeff.bowers@lmco.com
View Online	AF171-058	Non-Persistent Tracers for Particle Image Velocimetry in High-Mach Number Wind Tunnels	Develop a non-persistent nano-scale tracer injection system for particle image velocimetry in high-speed wind tunnels. Particles must have a known finite lifetime, survive and track flow in hypersonic wind tunnels, and accept fluorescent coatings.	LM Space Systems - SMD	Jeff Bowers	jeff.bowers@lmco.com
View Online	AF171-059	Sustainable High-temperature Hybrid Turbine Rotors	Develop a durable and sustainable joining method for high-temperature hybrid turbine components.			
View Online	AF171-060	Novel, Tactical-Sized Reconfigurable Aerial Refueling Boom	Develop a smaller sized aerial refueling boom concept that serves the needs of tactical aircraft, is more easily integrated onto a tanker in a variety of locations, and features novel actuation and control capabilities for robust operation.			
View Online	AF171-061	Micro Reactor Synthesis of Energetic Ionic Liquids	To develop a safe, low cost and continuously processed energetic ionic liquids and synthesizing the raw materials that are blended together to produce AF-M315E.			
View Online	AF171-062	Sensor Open System Architecture (SOSA) Architectural Research	Seek technology development of standards and architectures that provide uniformity, interoperability and open architecture while driving down procurement and operational costs for acquired weapon systems.	LM Rotary and Mission Systems, Cyber, Ships and Advanced Technologies (RMS CSAT) LM Missiles and Fire Control (MFC) LM Rotary and Mission Systems, Integrated Warfare Systems & Sensors (RMS IWSS) LM Space Systems - SMD	Gretchen Head John Fontana Rebecca Gerskhovich Jeff Bowers	gretchen.head@lmco.com john.c.fontana@lmco.com rebecca.gershkovich@lmco.com jeff.bowers@lmco.com
View Online	AF171-063	Electronically Controlled Adaptive Polarization for Compact Broadband Transmitters and Receivers	Identify advanced concepts for adaptive polarization for use in compact, high-reliability broadband transmit and receive antenna system applications	LM Space Systems LM Missiles and Fire Control (MFC) LM Rotary and Mission Systems, Integrated Warfare Systems & Sensors (RMS IWSS)	Jesus Isarraras John Fontana Rebecca Gerskhovich	jesus.isarraras@lmco.com john.c.fontana@lmco.com rebecca.gershkovich@lmco.com

View Online	AF171-064	Energy Storage System	Development and demonstration of a rechargeable energy storage system that is able to provide storage to lift 14000lbs 120 within 15 seconds and 40 in 7 seconds where the motion will stop.	LM Space Systems - SMD	Jeff Bowers	jeff.bowers@lmco.com
View Online	AF171-065	Effects of GPS Degraded or Denied Environments on Delivery Vehicles	Perform Nuclear Command, Control & Communications (NC3) position, navigation, and timing (PNT) effects analysis of a degraded positioning system on Command and Control functions. The main focus is to understand potential effects on the delivery vehicle in a GPS degraded or denied environment and provide novel solutions to operate through these conditions.	LM Rotary and Mission Systems, C4 & Undersea Systems (RMS C4USS) LM Rotary and Mission Systems, Integrated Warfare Systems & Sensors (RMS IWSS) LM Space Systems - SMD	Michael Weingarten Rebecca Gerskhovich Jeff Bowers	michael.weingarten@lmco.com rebecca.gershkovich@lmco.com jeff.bowers@lmco.com
View Online	AF171-066	Real-Time Threat Database	Develop a threat scenario database architecture for space situational awareness and defensive space control which will enhance the ability to detect and characterize anomalous conditions in a timely fashion.	LM Space Systems LM Rotary and Mission Systems, Integrated Warfare Systems & Sensors (RMS IWSS) LM Space Systems - SMD	Jesus Isarraras Rebecca Gerskhovich Jeff Bowers	jesus.isarraras@lmco.com rebecca.gershkovich@lmco.com jeff.bowers@lmco.com
View Online	AF171-067	Miniaturization of Comprehensive Energetic Charged Particle Detectors for Anomaly Attribution	Drive Size, Weight, and Power lower by a factor of 2x to 4x for Energetic Charged Particle sensors over current designs.	LM Missiles and Fire Control (MFC) LM Space Systems - SMD	John Fontana Jeff Bowers	john.c.fontana@lmco.com jeff.bowers@lmco.com
View Online	AF171-068	Non Destructive Trusted FPGA Verification	Develop new methodologies to assess and verify Field Programmable Gate Array (FPGA) trust and integrity.	LM Rotary and Mission Systems, Cyber, Ships and Advanced Technologies (RMS CSAT) LM Space Systems LM Missiles and Fire Control (MFC)	Gretchen Head Jesus Isarraras John Fontana	gretchen.head@lmco.com jesus.isarraras@lmco.com john.c.fontana@lmco.com
View Online	AF171-069	Improved Data Fusion Techniques for Space-Based Remote Sensing	Develop and implement alternative/innovative fusion techniques to include traditional and non-traditional data sources for improvement in performance, and/or cost reductions for Remote Sensing missions.	LM Space Systems LM Rotary and Mission Systems, Integrated Warfare Systems & Sensors (RMS IWSS)	Jesus Isarraras Rebecca Gerskhovich	jesus.isarraras@lmco.com rebecca.gershkovich@lmco.com
View Online	AF171-070	Advanced Solar Cell Metallization	Develop innovative concepts for producing solar cell metallization which will provide performance resilience to the presence of semiconductor cracks.	LM Rotary and Mission Systems, Cyber, Ships and Advanced Technologies (RMS CSAT) LM Missiles and Fire Control (MFC)	Gretchen Head John Fontana	gretchen.head@lmco.com john.c.fontana@lmco.com
View Online	AF171-071	Integration of Tactical and Individual Satellite Operations with Global Operation and Control	Develop, integrate, and demonstrate a toolset which would enable seamless integrate of individual and tactical satellite operations centers with a higher level operations center Space Operations Center such as the JSpOC			
View Online	AF171-072	Integrated Photon Management for Multijunction Solar Cells	Technologies are sought to improve the radiation hardness of multijunction solar cells while improving their conversion efficiency through the use of integrated photon management features.	LM Rotary and Mission Systems, Cyber, Ships and Advanced Technologies (RMS CSAT) LM Space Systems - SMD	Gretchen Head Jeff Bowers	gretchen.head@lmco.com jeff.bowers@lmco.com
View Online	AF171-073	Weather Satellite	Develop a mission concept and low earth orbit small satellite bus and/or small sensor payload suitable for timely global multispectral imaging of cloud cover for military operations. Consider other data sources for a heterogeneous architecture	LM Space Systems LM Space Systems - SMD	Jesus Isarraras Jeff Bowers	jesus.isarraras@lmco.com jeff.bowers@lmco.com
View Online	AF171-074	Agile Inspector Satellite	Produce a small space situational awareness (SSA) satellite system with radically high DeltaV. Satellite should exceed 6 km/s of DeltaV to allow significant orbital maneuverability, for example transfer from Low Earth Orbit to Geostationary Orbit.	LM Space Systems LM Space Systems - SMD	Jesus Isarraras Jeff Bowers	jesus.isarraras@lmco.com jeff.bowers@lmco.com
View Online	AF171-075	Assured Autonomous Spacecraft GN&C via Hybrid Control	Develop innovative, novel approaches for hybrid mode-logic/discrete-time control/continuous-time physics spacecraft systems that provide mathematically rigorous guarantees of system behavior and performance.	LM Space Systems LM Space Systems	Brian Zimbelman Jesus Isarraras	brian.zimbelman@lmco.com jesus.isarraras@lmco.com
View Online	AF171-076	Wideband GPS Digital Payload Architecture	Develop a Global Positioning System (GPS) transmitter architecture capable of generating the L1, L2, and L5 signals and additional arbitrary signals at discretionary frequencies between 1 and 2 GHz.	LM Space Systems LM Space Systems	Brian Zimbelman Jesus Isarraras	brian.zimbelman@lmco.com jesus.isarraras@lmco.com
View Online	AF171-077	Cyber Vulnerabilities & Mitigations in the Radio Frequency Domain	Identify weaknesses and potential vulnerabilities of embedded system radios to cyber threats.	LM Rotary and Mission Systems, Cyber, Ships and Advanced Technologies (RMS CSAT) LM Space Systems LM Rotary and Mission Systems, C4 & Undersea Systems (RMS C4USS)	Gretchen Head Jesus Isarraras Michael Weingarten	gretchen.head@lmco.com jesus.isarraras@lmco.com michael.weingarten@lmco.com
View Online	AF171-078	SWIR-LWIR detectors employing Unipolar Barrier Architectures	Experimentally quantify the fundamental performance limits of unipolar barrier architecture infrared detectors through design & fabrication of such devices, and address the question of whether bandgap engineered devices can actually outperform traditional photodetector designs	LM Rotary and Mission Systems, Cyber, Ships and Advanced Technologies (RMS CSAT) LM Space Systems LM Missiles and Fire Control (MFC) LM Space Systems - SMD	Gretchen Head Jesus Isarraras John Fontana Jeff Bowers	gretchen.head@lmco.com jesus.isarraras@lmco.com john.c.fontana@lmco.com jeff.bowers@lmco.com
View Online	AF171-079	Automatic Exploitation of Energetic Charged Particle Sensor Data	Automate correlation of incidents of off-nominal spacecraft performance with energetic charged particle drivers to improve space environment anomaly attribution.			
View Online	AF171-080	Dual Band Focal Plane Array	To develop a dual-band focal plane array EO/IR (0.4 to 2.5 micron) low-size and weight, power and cost (SWaP-C) camera with on-board sensor fusion.	LM Space Systems LM Missiles and Fire Control (MFC) LM Space Systems - SMD	Jesus Isarraras John Fontana Jeff Bowers	jesus.isarraras@lmco.com john.c.fontana@lmco.com jeff.bowers@lmco.com
View Online	AF171-081	Low-Light SWIR Vision Systems	Develop an advanced, high dynamic range vision system concept, processing techniques, and hardware for sensing the environment in the SWIR wavelengths under both regular and photon-limited conditions.	LM Rotary and Mission Systems, Cyber, Ships and Advanced Technologies (RMS CSAT) LM Missiles and Fire Control (MFC) LM Space Systems - SMD	Gretchen Head John Fontana Jeff Bowers	gretchen.head@lmco.com john.c.fontana@lmco.com jeff.bowers@lmco.com
View Online	AF171-082	Modeling and Simulation of Complex Multiphase Interaction of Energetic Materials	Develop algorithms for predicting the physics and effects of non-traditional blast events, such as multiphase blast events. Algorithms that can be implemented within existing computer simulation tools such as CTH or ALE3D are preferred.	LM Missiles and Fire Control (MFC)	John Fontana	john.c.fontana@lmco.com
View Online	AF171-083	High-g MEMS Accelerometer Sensor for Hard Target Applications	Develop a low cost SWAP replacement for the current MEMS accelerometer sensor in the Hard Target Void Sensing Fuze (FMU-167).	LM Missiles and Fire Control (MFC) LM Space Systems - SMD	John Fontana Jeff Bowers	john.c.fontana@lmco.com jeff.bowers@lmco.com

View Online	AF171-084	Advanced Bio-inspired Imaging System with Multiple Optical Sensing Modes	To develop a multi-spectral EO/IR sensor to enhance target identification and clutter/obfuscation rejection.	LM Missiles and Fire Control (MFC)	John Fontana	john.c.fontana@lmco.com
View Online	AF171-085	Small Munitions Advanced Seeker Handoff (SMASH)	To integrate national ISR and satellite into a real-time target identification and targeting network for weapons cueing and control	LM Space Systems - SMD	Jeff Bowers	jeff.bowers@lmco.com
View Online	AF171-086	Full-size Warhead Computed Tomography	Augment existing munition X-ray facility to perform computed tomography	LM Space Systems - SMD	Jeff Bowers	jeff.bowers@lmco.com
View Online	AF171-087	FRM Automated Development (FAD)	Develop an automated software methodology that can reduce the overall time, costs, & complexity associated with the development of fast-running response models for the structural & infrastructure components of urban structures.	LM Missiles and Fire Control (MFC) LM Rotary and Mission Systems, C4 & Undersea Systems (RMS C4USS)	John Fontana Michael Weingarten	john.c.fontana@lmco.com michael.weingarten@lmco.com
View Online	AF171-088	Reactive Composite Materials for Asymmetric Shock Propagation in Multi-Functional Weapons	Develop material solutions that can provide enhanced lethality and selectable energy outputs from mitigated, attenuated or directional shock propagation.	LM Missiles and Fire Control (MFC) LM Space Systems - SMD	John Fontana Jeff Bowers	john.c.fontana@lmco.com jeff.bowers@lmco.com
View Online	AF171-089	High Voltage (HV) Fireset Systems and Subsystem Component Level Designs	Develop super low inductance HV Fireset System, focused on enhanced performance for CDU switches and HV capacitors subsystem technology with very low ESR, high peak current capability, and ultra-fast di/dt current rates operating from 1kV to 60kV.			
View Online	AF171-090	Deep Learning Tools and Architectures for Munitions (DeLTA-M)	Apply recent advances and develop innovative solutions in deep learning techniques to support future autonomous weapons.	LM Missiles and Fire Control (MFC)	John Fontana	john.c.fontana@lmco.com
View Online	AF171-091	Corrosion Indicating Coatings for Aircraft Bilges and Wheel Wells	Develop a coating for application in aircraft bilge and wheel well locations that will change color upon corrosion of substrate, indicating where corrosion maintenance needs to be performed.	LM Missiles and Fire Control (MFC) LM Rotary and Mission Systems, C4 & Undersea Systems (RMS C4USS)	John Fontana Michael Weingarten	john.c.fontana@lmco.com michael.weingarten@lmco.com
View Online	AF171-092	Coating Additives for Enhanced Laser De-paint	Incentivize small business to develop additives that can be integrated into currently qualified aerospace coating systems (primers and/or topcoats) to regulate strippability with near-infrared (IR) laser systems. The coating systems with the additives included shall be qualified to either MIL-PRF-23377, MIL-PRF-85285, MIL-PRF-32239, TT-P-2760, or MIL-P-81733. Additionally, the proposed additives cannot result in coatings with higher environmental, safety or occupational health risks than the current coatings.	LM Missiles and Fire Control (MFC)	John Fontana	john.c.fontana@lmco.com
View Online	AF171-093	Low Hyrdrogen Embrittlement (LHE) Brush Plating Chemistries for Cadmium (Cd) Replacement	Incentivize small business to develop solutions that can replace the current cadmium (Cd) chemistries used on high strength steel aircraft components for corrosion protection	LM Missiles and Fire Control (MFC)	John Fontana	john.c.fontana@lmco.com
View Online	AF171-094	Improved Non-Damaging Method of Removing Powder Coating System	Develop materials and processes to remove powder coatings from military weapon systems and associated equipment.	LM Missiles and Fire Control (MFC)	John Fontana	john.c.fontana@lmco.com
View Online	AF171-095	Computational corrosion modeling for Condition Based Maintenance Plus (CBM+)/aircraft environment tracking	Develop a corrosion model which tracks aircraft environmental exposure using off-board sensors and produces a corrosion severity index which can be used to adjust the corrosion related maintenance activities based upon the condition of the aircraft.			
View Online	AF171-099	Diffusely Scattering Paints for Remotely Piloted Aircraft	Develop sprayable paint system highly efficient (threshold 95% objective >98%) at reflecting or backscattering visible or shortwave infrared light for thermal control.	LM Missiles and Fire Control (MFC)	John Fontana	john.c.fontana@lmco.com
View Online	AF171-100	Manufacturing and Metrology of High Magnetic Permeability Materials for High Efficiency, Wideband, and Conformal RF Antennas	Mature material synthesis and metrology for high-permeability materials to enable magnetic high-impedance ground planes. Mate materials with models to predict RF antenna. Demonstrate broadband (HF to UHF), efficient, conformal RF antenna.	LM Rotary and Mission Systems, Cyber, Ships and Advanced Technologies (RMS CSAT) LM Space Systems LM Missiles and Fire Control (MFC) LM Rotary and Mission Systems, Integrated Warfare Systems & Sensors (RMS IWSS)	Gretchen Head Jesus Isarraras John Fontana Rebecca Gershkovich	gretchen.head@lmco.com jesus.isarraras@lmco.com john.c.fontana@lmco.com rebecca.gershkovich@lmco.com
View Online	AF171-101	Additive Manufacturing of Freeform Optical Elements for Imaging System Weight and Volume Reduction	Demonstrate the utility (cost, schedule, and performance) of additive manufacturing for large (= 250 mm diameter) freeform optical elements operating in reflection and transmission. Demonstrate weight and volume reductions over current systems.	LM Space Systems LM Missiles and Fire Control (MFC) LM Space Systems - SMD	Jesus Isarraras John Fontana Jeff Bowers	jesus.isarraras@lmco.com john.c.fontana@lmco.com jeff.bowers@lmco.com
View Online	AF171-102	Portable, Precision Automated Welding for Aerospace Alloys	Develop a portable, automated weld system capable of being taken to a work area to perform automated precision weld repairs on aerospace grade materials.	LM Missiles and Fire Control (MFC)	John Fontana	john.c.fontana@lmco.com
View Online	AF171-103	Tailpipe Coating Thickness Measurement Capability	Develop a field-level capability to inspect coating thickness in high temperature exhaust components. The technology must be applicable to complex geometry surfaces as well as over varying substrates and thermal barrier coating materials.	LM Missiles and Fire Control (MFC) LM Rotary and Mission Systems, C4 & Undersea Systems (RMS C4USS)	John Fontana Michael Weingarten	john.c.fontana@lmco.com michael.weingarten@lmco.com
View Online	AF171-104	Portable, Localized Low Observable (LO) Coating Removal Tool	Develop a small, portable hand tool to measure outer mold line (OML) coating thickness and accordingly cut/score between 90%-95% of total coating thickness.	LM Aeronautics (Aero) LM Missiles and Fire Control (MFC)	Craig Owens John Fontana	craig.l.owens@lmco.com john.c.fontana@lmco.com
View Online	AF171-105	High Altitude Electromagnetic Pulse (HEMP) Protection for Nuclear Command and Control Communications (NC3) Systems	Develop and demo capability to provide HEMP protection for C2 systems and power sources within Wing Command Posts (WCPs) or used by Mobile Support Teams (MSTs). This shield or barrier should prevent/limit HEMP fields & conducted transients from damaging Nuclear Command, Control, and Communication (NC3) systems.	LM Missiles and Fire Control (MFC) LM Space Systems - SMD	John Fontana Jeff Bowers	john.c.fontana@lmco.com jeff.bowers@lmco.com
View Online	AF171-106	Improved manufacturing and design of liquid electrolyte delivery systems	Develop manufacturing and design capabilities that reduce cost and improve quality/reliability of remotely activated batteries.	LM Missiles and Fire Control (MFC)	John Fontana	john.c.fontana@lmco.com

View Online	AF171-107	Continuously Self-Leveling Weapons-Storage Support Structure	Develop and demonstrate capability to continuously monitor and maintain an approximate 10 metric ton weapon support structure in a level state, while four (4) linear actuators cause it to ascend and descend. If not kept in a level state, binding and wear may result.			
View Online	AF171-108	All-Fiber Optical Isolators for High Energy Lasers	Develop magneto-optic materials and associated device designs for all-fiber optical isolators for use with single-fiber laser amplifiers emitting >5kW. These devices are needed for operation at laser wavelengths near 1m and near 2m.	LM Space Systems LM Space Systems	Brian Zimbelman Jesus Isarraras	brian.zimbelman@lmco.com jesus.isarraras@lmco.com
View Online	AF171-109	Structural Directed Energy and Nuclear Effect Mitigation of Composite Aeroshells for Munitions	Development, scale-up, and demonstration of munition relevant composite structural aeroshell materials designed to provide protection from directed energy, nuclear EMP, and nuclear particle effects.	LM Missiles and Fire Control (MFC) LM Space Systems - SMD	John Fontana Jeff Bowers	john.c.fontana@lmco.com jeff.bowers@lmco.com
View Online	AF171-110	Additive Manufacturing Process for High Resolution Conductive Traces	Develop an additive manufacturing process capable of writing micron-scale features for frequency selective surfaces.	LM Rotary and Mission Systems, Cyber, Ships and Advanced Technologies (RMS CSAT) LM Missiles and Fire Control (MFC) LM Rotary and Mission Systems, C4 & Undersea Systems (RMS C4USS) LM Space Systems - SMD	Gretchen Head John Fontana Michael Weingarten Jeff Bowers	gretchen.head@lmco.com john.c.fontana@lmco.com michael.weingarten@lmco.com jeff.bowers@lmco.com
View Online	AF171-111	Nondestructive Quantification of the Degraded Elastic Modulus and Poisson's Ratio of Impact Damaged Polymer Matrix Composites	Using single-sided inspection(s), nondestructively quantify the degraded elastic modulus and Poissons ratio in an impacted Polymer Matrix Composite (PMC) with a spatial accuracy of 0.01 in. and estimated properties NTE 5% of those found via traditional mechanical testing.	LM Aeronautics (Aero) LM Missiles and Fire Control (MFC) LM Space Systems - SMD	Craig Owens John Fontana Jeff Bowers	craig.l.owens@lmco.com john.c.fontana@lmco.com jeff.bowers@lmco.com
View Online	AF171-112	Thermal Modeling Base High-Temperature Polymer Matrix Composite (PMC) Structural Repair	Develop thermal modeling capability to enable selection of heating, cooling, and insulation approaches to be used in conjunction, for on-aircraft curing of high-temperature repair materials while preventing damage to existing structure and systems.	LM Aeronautics (Aero) LM Space Systems - SMD	Craig Owens Jeff Bowers	craig.l.owens@lmco.com jeff.bowers@lmco.com
View Online	AF171-113	Solid-State Amplifier/Transmitter replacements for Travelling Wave Tube (TWT) Technology	Increase availability, affordability, and reliability of amplifier components over current traveling wave tube (TWT) technology used in legacy missile warning/defense radars.	LM Missiles and Fire Control (MFC) LM Rotary and Mission Systems, Integrated Warfare Systems & Sensors (RMS IWSS)	John Fontana Rebecca Gershkovich	john.c.fontana@lmco.com rebecca.gershkovich@lmco.com
View Online	AF171-114	Enhancing Systems Engineering for Complex Systems with Digital Thread	Develop integrated System-of-Systems design space to stitch design artifacts (e.g., electrical signals, digital logic, etc.) across individual systems into a System-of-Systems.	LM Space Systems LM Missiles and Fire Control (MFC) LM Rotary and Mission Systems, Integrated Warfare Systems & Sensors (RMS IWSS) LM Space Systems - SMD	Jesus Isarraras John Fontana Rebecca Gershkovich Jeff Bowers	jesus.isarraras@lmco.com john.c.fontana@lmco.com rebecca.gershkovich@lmco.com jeff.bowers@lmco.com
View Online	AF171-115	3-D Antenna Technology using Additive Manufacturing	Survey state-of-the-art technology for additively manufactured antennas to form a conformal active aperture with integral active components embedded in the phased array, and propose an innovative solution to implement it on an airborne platform.	LM Space Systems LM Missiles and Fire Control (MFC) LM Rotary and Mission Systems, C4 & Undersea Systems (RMS C4USS) LM Rotary and Mission Systems, Integrated Warfare Systems & Sensors (RMS IWSS) LM Space Systems - SMD	Jesus Isarraras John Fontana Michael Weingarten Rebecca Gershkovich Jeff Bowers	jesus.isarraras@lmco.com john.c.fontana@lmco.com michael.weingarten@lmco.com rebecca.gershkovich@lmco.com jeff.bowers@lmco.com
View Online	AF171-116	Scalable Coherent Photonic Array on a Silicon Platform	Design and fabricate a scalable, coherent photonic array on a silicon platform.			
View Online	AF171-117	Multi-Sensor/Multi-Platform Integration and Sensor Resource Management	To create algorithms to support distributed unmanned air vehicle (UAV) swarm sensing management via an Autonomous Resource Manager (ARM) to plan the sensing operations of many multi-spectral sensors across many platforms to meet pre-defined mission objectives.	LM Missiles and Fire Control (MFC) LM Rotary and Mission Systems, Integrated Warfare Systems & Sensors (RMS IWSS)	John Fontana Rebecca Gershkovich	john.c.fontana@lmco.com rebecca.gershkovich@lmco.com
View Online	AF171-118	Develop a Small Pitch LADAR Receiver for Low SWAP Sensing	Design, fabricate, and test laser detection and ranging (LADAR) sensor laser and detector components for 3-D imaging. The technologies should be designed to support operations from a platform with tight size weight, power, and cost (SWAP-C) constraints.	LM Space Systems LM Missiles and Fire Control (MFC) LM Space Systems - SMD	Jesus Isarraras John Fontana Jeff Bowers	jesus.isarraras@lmco.com john.c.fontana@lmco.com jeff.bowers@lmco.com
View Online	AF171-119	NIIRS 9 Small Unmanned Aircraft System (SUAS) 5-Inch Gimbal	Develop a National Imagery Interpretability Rating Scale (NIIRS) 9 capable 5 inch gimbal suitable for Common Launch Tube (CLT)-compatible SUAS platforms.	LM Missiles and Fire Control (MFC) LM Space Systems - SMD	John Fontana Jeff Bowers	john.c.fontana@lmco.com jeff.bowers@lmco.com
View Online	AF171-120	Direct Measurement of Targeting Coordinates from Small Unmanned Aerial Systems (SUAS) EO/IR Gimbal Systems	Develop software and hardware solutions to enable direct measurement of targeting coordinates from gimbals mounted on SUAS.	LM Missiles and Fire Control (MFC) LM Space Systems - SMD	John Fontana Jeff Bowers	john.c.fontana@lmco.com jeff.bowers@lmco.com
View Online	AF171-121	Integrated Circuit (IC) Die Extraction and Reassembly (DER) for More Complicated ICs	Evaluate performance, reliability, and safety of more complicated circuits repair (e.g., repair of hybrids and modules using extracted die). Develop new techniques to perform assessment as needed.	LM Rotary and Mission Systems, Cyber, Ships and Advanced Technologies (RMS CSAT) LM Missiles and Fire Control (MFC)	Gretchen Head John Fontana	gretchen.head@lmco.com john.c.fontana@lmco.com
View Online	AF171-122	V/W-band Accelerated Life Test System	Develop a V/W-band accelerated-temperature radio frequency (RF) life test system for multi-channel testing of solid-state power amplifier device technologies.	LM Missiles and Fire Control (MFC)	John Fontana	john.c.fontana@lmco.com
View Online	AF171-123	Dual Ka/Q-Band Low Noise Amplifiers	Develop dual Ka-band and Q-band low noise amplifiers for satellite communications (SATCOM), point-to-point digital radios, and wideband receiver applications.	LM Missiles and Fire Control (MFC)	John Fontana	john.c.fontana@lmco.com
View Online	AF171-124	Ultra-Endurance UAV	Produce a low cost, ultra-long endurance (>7 day) Unmanned Air Vehicle (UAV) suitable for intelligence, surveillance and reconnaissance (ISR) missions.	LM Missiles and Fire Control (MFC)	John Fontana	john.c.fontana@lmco.com
View Online	AF171-125	Aerial Refueling of UAVs	Radically increase mission length and on-station availability of Unmanned Air Vehicles (UAVs) by developing capability to conduct air-to-air refueling (AAR) of Groups 4 and 5 UAVs with calibrated airspeeds of 130 KCAS or less.	LM Missiles and Fire Control (MFC)	John Fontana	john.c.fontana@lmco.com
View Online	AF171-126	Integrable high-performance analog optical modulators	Develop integrated analog photonic modulator components compatible with photonic foundry production.			

View Online	AF171-127	Programmable Feed to Enable Low Frequency Measurements in Small Compact Far-Field Antenna Ranges	Develop a feed network for use in compact far-field ranges to extend the lower frequency cutoff of ranges with smaller reflectors.	LM Rotary and Mission Systems, Cyber, Ships and Advanced Technologies (RMS CSAT)	Gretchen Head	gretchen.head@lmco.com
View Online	AF171-128	http://www.acq.osd.mil/osbp/sbir/solicitations/sbir20171/index.shtml	Develop an advanced analog-to-digital converter (ADC) that enables >100 megasamples per second (MSps) & up to 350 MSps with 16 effective number of bits (ENOB) conversion for GPS receivers. Design should limit cycle latency & minimize power and complexity.	LM Missiles and Fire Control (MFC) LM Space Systems - SMD	John Fontana Jeff Bowers	john.c.fontana@lmco.com jeff.bowers@lmco.com
View Online	AF171-129	Focal Plane Arrays (FPAs) for Coherent Ladar	Develop innovative fast framing small format FPAs needed for multi-function coherent sensors in the short wave infrared. Successful solutions will be low noise and compatible with space constrained airborne environments.	LM Space Systems LM Missiles and Fire Control (MFC) LM Space Systems - SMD	Jesus Isarraras John Fontana Jeff Bowers	jesus.isarraras@lmco.com john.c.fontana@lmco.com jeff.bowers@lmco.com
View Online	AF171-130	Small Unmanned Aircraft System (SUAS) 5-Inch Gimbal with Full Motion Video and Hyperspectral	Develop a gimbal capable of collecting full motion video and hyperspectral measurements suitable for Small Unmanned Aircraft Systems (SUAS) platforms.	LM Space Systems LM Missiles and Fire Control (MFC)	Jesus Isarraras John Fontana	jesus.isarraras@lmco.com john.c.fontana@lmco.com