

Transformative Research & Technologies

For questions, email:

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What lies beyond the technologies that we envision using over the next decades for a return to the Moon and follow-on missions to Mars? Which emerging technologies will transform space transportation as we know it? How might space materials and systems be harnessed to address our greatest challenges on Earth? We live in a time where today's research has the capacity to answer questions like these and lead to radically new technologies that revolutionize our existing models, dramatically drive down costs, and enable new opportunities.

In 1865, Jules Vern imagined a world where traveling to space was a reality. A century and a half later, we are poised to envision a future that lies beyond our current technologies and that will shift our existing paradigms in the coming centuries. Science fiction writers shape the future with their imaginations. Scientists and engineers create the future with our work. AIAA and the supporting technical committees solicit papers that emphasize transformative research of high risk and potentially high reward. Revolutionary ideas, research, breakthroughs, and discoveries that will accelerate the building of our off-world future – not just incremental growth, but order of magnitude transformations in the human experience beyond Earth.

Topics of interest include, but are not limited to:

- » Advanced Materials
- » Advanced Propulsion Systems and Concepts
- » Advanced Surface and In-Space Power Systems
- » Advanced Telecommunications
- » Alternative Business Models and Revenue Streams to Fund Future Space Activity
- » Artificial Intelligence
- » Cloud/Edge Computing Applications
- » Development of Technologies that Further Low-Cost Access to Space
- » Development of Technologies that Enable Expanded Human Exploration
- » Development of Technologies that support Enhanced Security of Space-based platforms
- » Distant Future Visions (100-500 years)
- » Factor of 10 or Greater Cost Reductions
- » Integrated Long Range (e.g. 100-year) Plan for Human Space Activity
- » Internet of Things and 5G Applications
- » Life After Mars (human space activity after the initial Mars human missions)
- » Main Belt Asteroid Human Exploration
- » Mega Lift Capability (Earth launch systems with greater than 200 MT to LEO performance)
- » Mercury and Venus Human Exploration
- » Miniaturization
- » New Manufacturing, Assembly, Integration, or Testing Processes (terrestrial and extra-terrestrial)
- » Outer Planet Human Exploration
- » Reformed/Revolutionary Acquisition Paradigms
- » Small Size Workforce for Crewed Spacecraft Production
- » Space Applications of Technologies Developed for Autonomous Vehicles, Electric Vehicles, Urban Air Mobility, Robotics, etc.
- » Space Elevators
- » Space Tethers