

Additional Information: Space Exploration

Space Exploration Track at ASCEND 2021 is organized by AIAA Space Exploration Integration and Outreach Committee (SEIOC). Contact: Surendra.p.sharma@nasa.gov; 650-793-9689.

We are soliciting abstracts, as well as pitches for community dialogue topics to be discussed in panel form on the following subtopics:

- I. **Mission Architectures:** Studies, systems analysis, and operational scenarios for human exploration missions beyond Earth orbit, including, but not limited to: In-Space infrastructure development scenarios, Lunar exploration and sustained human presence on the lunar surface, Mars expeditions, Missions to outer planets and other bodies.
- II. **Lunar Exploration:** Essential commodities for sustained human presence, Enabling infrastructure, such propellant depots, communication hubs, power generation etc., technological robotic and human activities, such as in-space Resource Utilization (ISRU) etc, Facilities and analogue research on mission to Mars and other planets from lunar surface, Consumer commodities developments, such as mining, power beaming to Earth, tourism etc.
- III. **Enabling Technologies:** Advanced propulsion; cryogenic propellant storage and transfer; high-efficiency space power systems; life support systems and habitation systems; radiation shielding; entry, descent, and landing technology, EVA technology; advanced robotics; autonomous systems and avionics; high-data-rate communications; in-situ resource utilization; maintenance of space systems; and lightweight structures and materials.
- IV. **Robotic Precursor Missions and Human Exploration missions:** Exploration, logistics and precursor/test missions to the moon, Lagrange points, Near Earth Objects (NEOs), etc.
- V. **Flight Systems:** Hardware specific development activities, new concepts, game changing technologies and simulations.
- VI. **Using ISS and Terrestrial Analogs for Exploration:** Any activity related to mission testing/feasibility study requiring low g environment, analogue for planetary missions from Cis-Lunar space, material processing in low g environment, analog for long-duration missions, and technology demonstrations and operational concepts for exploration, and human physiological effects of low gravity.
- VII. **In-Space Infrastructure:** Near-term and long-term essential Cis-Lunar space infrastructure to facilitate easy and economical access to space, such as: Way-Points/Gateways/ Habitation Systems, Propellant depot, Communication hubs, Cis-Lunar transportation, Space Power Utilities and related infrastructure, Satellite Servicing, In-Situ Resource Utilization. Also, necessary dialogues on strategic locations and near-term, mid-term and long-term implementation strategy.
- VIII. **Accelerating the Space Economy:** Dialogue on development of essential and enabling in-space infrastructure to stimulate and accelerate the growth of space economy and generate significant benefits to people on Earth. Public and private partnerships, space policy.
- IX. **National Science Priorities:** Visionary roadmaps for sustained human presence in space, space exploration related space policy, community outreach.

- X. **Life Sciences (Humans in Space):** Life sustaining essentials for space, enabling technologies, and medical break-through and analysis etc.
- XI. **Planetary Defense:** Earth Science related topics, such as “Mission to Planet Earth”, monitoring and management of Near-Earth Objects.
- XII. **Longer Duration Space Missions (up 50+ years):** Hardware and management challenges, inter-generational knowledge and management transfer issues, available and future enabling technologies, and dialogue on need and benefits of such missions.

About Space Exploration Integration and Outreach Committee (SEIOC):

Context and Goals:

The SEIOC serves as the focal point for promoting awareness and advancement of space exploration, both in the national and international community. The SEIOC is chartered to disseminate relevant information on leading-edge, current, new, emerging space exploration programs throughout the world, including, but not limited to, NASA, DoD, Commercial and International entities. SEIOC also serves as a technical and policy advisory group to relevant stakeholders on issues related to 1) General knowledge and awareness of exploration systems, 2) Technological needs and gaps, 3) Inter-disciplinary and inter-committee interactions, and 4) Political, management and international challenges.

The Space Exploration Integration Committee strives to:

- 1) Evaluate and recommend research and development, relevant progress, and technological challenges and gaps in support of the advancement of space exploration.
- 2) Focus attention on the present and future requirements for advancing progress in space exploration.
- 3) Promote awareness and understanding of leading-edge, current, new, and emerging space exploration programs throughout the world among relevant scientific and technological stakeholders at home and abroad.
- 4) Advance understanding of exploration systems.
- 5) Inter-disciplinary and inter-committee interactions, and political management and international challenges and opportunities as related to space exploration.
- 6) Work with domestic stakeholders and international partners in brokering the resolution of issues affecting space exploration and, when appropriate provide educational and advisory support.
- 7) Assist the AIAA, through its Technical Committees, in developing programs for meetings and other technical venues, and in providing the Institute with authoritative opinion and/or recommendations in the chartered areas of concern.