

AIAA Roles in Microgravity Community

27 October 2020

Shaping a Bold Future Together



LEAD HUMANITY
BEYOND PLANET EARTH



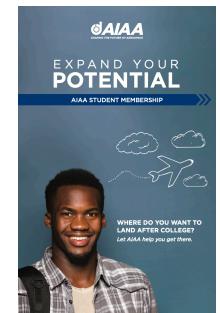
DEFINE NEXT
CENTURY OF FLIGHT



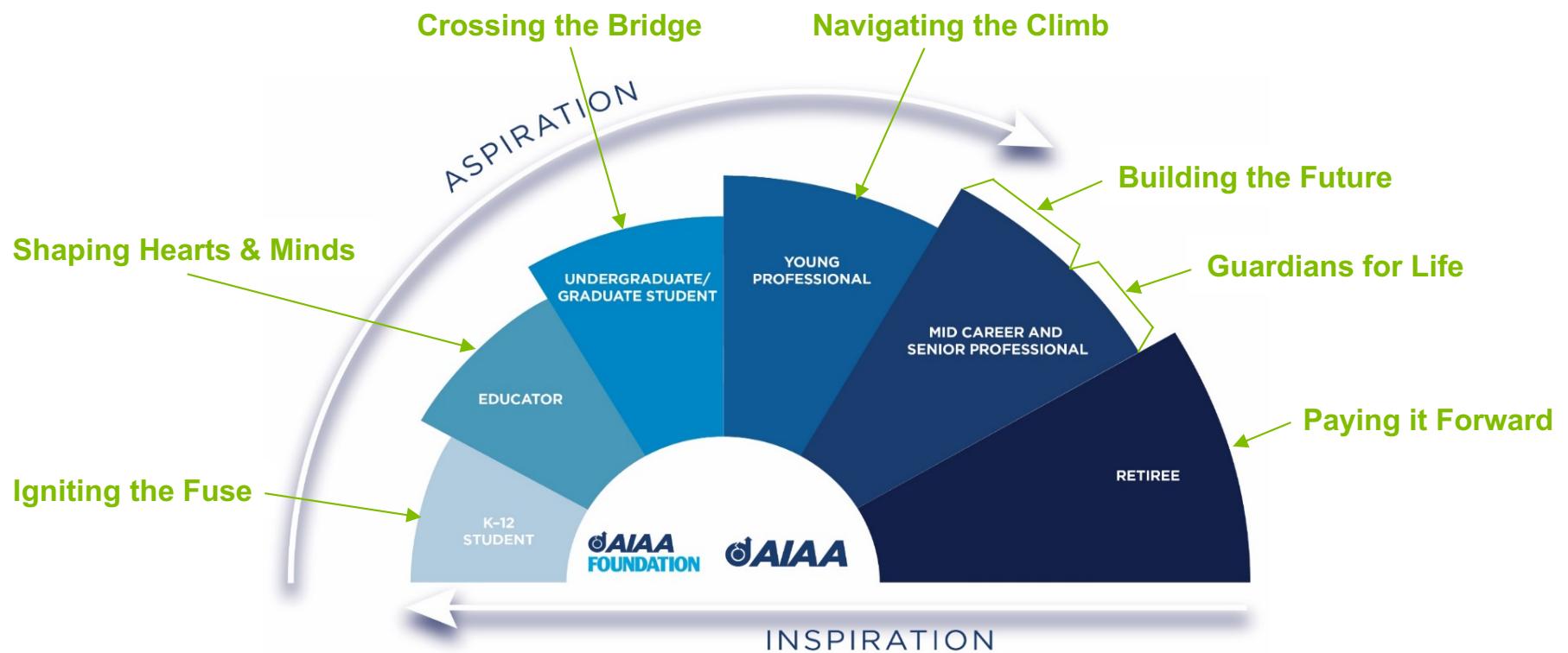
CREATE THE
WORLD WE DREAM

AIAA KEY ROLES

- Connect People, Ideas, and Resources
- Advance Career Journeys
- Build Technical Agility and Cohesion
- Establish United Front to Solve Critical Issues



AIAA Member Segments



AIAA Public Policy

2020 ELECTION:
**SPACE POLICY
PLATFORM
PAPER**



The importance of United States space activities to the modern economy, our way of life, and our global stature cannot be understated. American space preeminence – a singular source of national pride – is established through international partnerships in civil space exploration and satellite services; a blossoming commercial industry; essential military satellites for navigation and timing, surveillance, early warning, communications; and the critical nature of space in our innovation ecosystem.

KEY POINTS

The United States must continue to lead in space with sustained policies, programs, and investment (funding) that have bipartisan support. Space has historically been a unifying issue and there is, in general, consensus and strong support in the country and Congress for national space programs. Continuity of policies and programs that are meeting their objectives and adding value to the nation's technological advancement, scientific knowledge, and strategic security is necessary to maintain "constancy of purpose" and prevent excessive cost and delay. This includes robust government support of basic research that identifies new technologies and frontiers in science. Such research is often the source of technological breakthroughs that fuel America's engine of innovation. A whole-of-government approach is essential to build on successful past policies and programs. Examples include the creation of \$17 trillion in economic value since the Global Positioning System (GPS) was made available for civilian and commercial use; the establishment of the moon as a focal point for civil and commercial space in service of national leadership goals; and the interagency Science & Technology Partnership Forum that collaborates on cross-cutting space technology strategies. U.S. space leadership can be defined in terms of three principal sectors: civil, commercial, and national security. In addition to sustaining the programs-of-record, new government investments in advancing space domain awareness, accelerating the pace of satellite production and deployment, and on-orbit servicing, assembly, and manufacturing infrastructure are needed to ensure the United States has both the actionable information and the industrial capacity to maintain leadership in each sector.

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CRITICAL SECTORS

The benefits of U.S. leadership in civil space are wide ranging, as often exemplified by NASA and NOAA programs in space science, human exploration, weather and climate monitoring, and Earth remote sensing. NASA has also led one of the most successful and technically complex modern international partnerships: the International Space Station (ISS). Now NASA envisions a return to the moon and future human exploration of Mars through national capabilities like the Space Launch System (SLS) rocket, Orion crew module, the Lunar Gateway, and new industry partnerships for lunar surface operations.

The commercial space sector has traditionally been dominated by private satellite operators for global telecommunications. Collecting and transmitting data around the world at the speed of light remains an important and lucrative business. Advances in launch technology, the miniaturization of satellite systems, such as CubeSats and other "small sats"; and the increasing use of public-private partnerships by government agencies are accelerating the growth of new entrants into the space economy and the creation of new transportation and satellite services that were previously only available through large national programs. This enables both private and government customers to obtain more value from space-based services.

The modern U.S. defense enterprise is wholly dependent on national security space capabilities, ranging from communications and precision navigation for air, land, and sea; to strategic and tactical early warning; to intelligence collection and treaty compliance monitoring. However, near-peer adversaries, such as Russia and China, threaten those critical assets with new anti-satellite weapons and increasingly sophisticated denial and deception operations. This is all intended to either prevent overhead collection or deny our forces access to the data generated by U.S. satellite assets. Deterring threats to U.S. space infrastructure requires new strategies and operations unique to the space environment.

THEMES TO BE ADDRESSED

AIAA has identified several key themes in U.S. space policy that must be addressed to ensure ongoing global leadership, maintain space superiority over our adversaries, and expand the benefits of this highly technological sector for our society.

Continued, balanced investment in human space exploration, scientific research, and space technology development is essential to increase our understanding of both the Earth and the universe, create the space technologies needed to sustain economic growth and increase value to society, and inspire our youth to study scientific disciplines and pursue the variety of careers available.

Constancy of purpose in human space exploration enables the first crewed missions beyond low Earth orbit in 50 years. The United States must continue successful international partnerships – including the ISS – to retain critical experience and leverage the capabilities NASA has developed for a return to the moon, such as SLS, Orion, Gateway, Commercial Lunar Payload Services, and other programs.

Civil space situational awareness and space traffic management capabilities are fundamental to safety of operations, attribution of space events, and sustainable, industry-friendly space practices. These practices should be based on shared values of open access for people and markets for peaceful purposes. The White House and Congress should prioritize giving the authority and transitioning resources to civil management, which will enable the U.S. Space Command to focus on its core missions.

U.S. ambitions in space science, exploration, and defense depend on policies **enabling innovations for national strategic benefit** and the continued **reduction of barriers to entry** for entrepreneurial ventures and early innovators. Examples include maintaining a U.S. National Laboratory in low Earth orbit as an incubator for new businesses and space technologies; reviewing and assessing the constraints that export controls and licensing requirements impose on space businesses; and granting and incentivizing the use of urgently needed, streamlined acquisition authorities, such as Other Transaction Authorities, commercial services contracts, and joint ventures.

The United States must also **strengthen our coalitions and partnerships with our allies in civil and defense space** to promote our values and ensure freedom of movement in space. Examples include continued implementation of the Artemis Accords; creating a common approach and international standards for space situational awareness and space traffic management in which peaceful missions can navigate cooperatively and as freely as maritime traffic; collaboration on debris mitigation and hazard avoidance; and engaging stalwart military allies, like the Five Eyes intelligence partnership and the NATO alliance, on topics of mutual interest for our national security space strategy.

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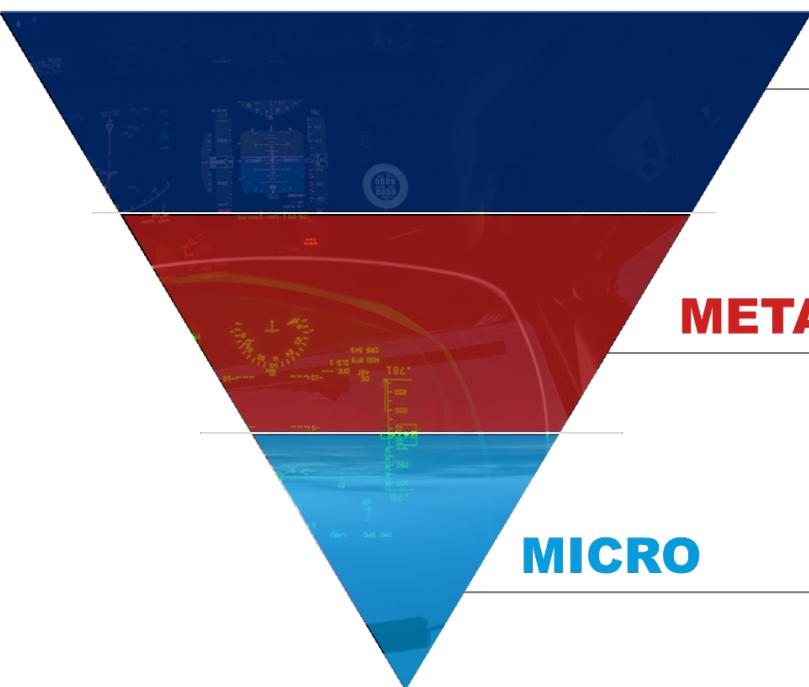
Applicable AIAA Technical Committees

- **Life Sciences and Systems**
- **Microgravity and Space Processes**
- **Reusable Launch Vehicles**
- **Small Satellite**
- **Space Architecture**
- **Space Automation and Robotics**
- **Space Colonization**
- **Space Logistics**
- **Space Operations and Support**
- **Space Resources**
- **Space Systems**
- **Space Tethers**
- **Space Transportation**

ASCEND

ACCELERATING SPACE COMMERCE,
EXPLORATION, AND NEW DISCOVERY

Event Format



MACRO

TODAY'S GENERAL SESSION → INSIGHT, INSPIRATION

A new approach to industry topics and challenges

*Example: Funding and regulatory challenges in space science.
Panel of Program Managers discussing funding and regulation implications on their project/program.*

META

DISCUSSION, DISTILLATION, DEBATE

Interactive engagement in sector and/or function specific content

*Q&A: James Webb Telescope Team
Q&A: Air Force's GPS OCX and FAB-T Teams
Q&A: Commercial Crew Program Team*

MICRO

TODAY'S TECHNICAL SESSIONS → DECIDE, APPLY

One-on-one meetings, technical education courses, poster sessions, tutorials that lead to application

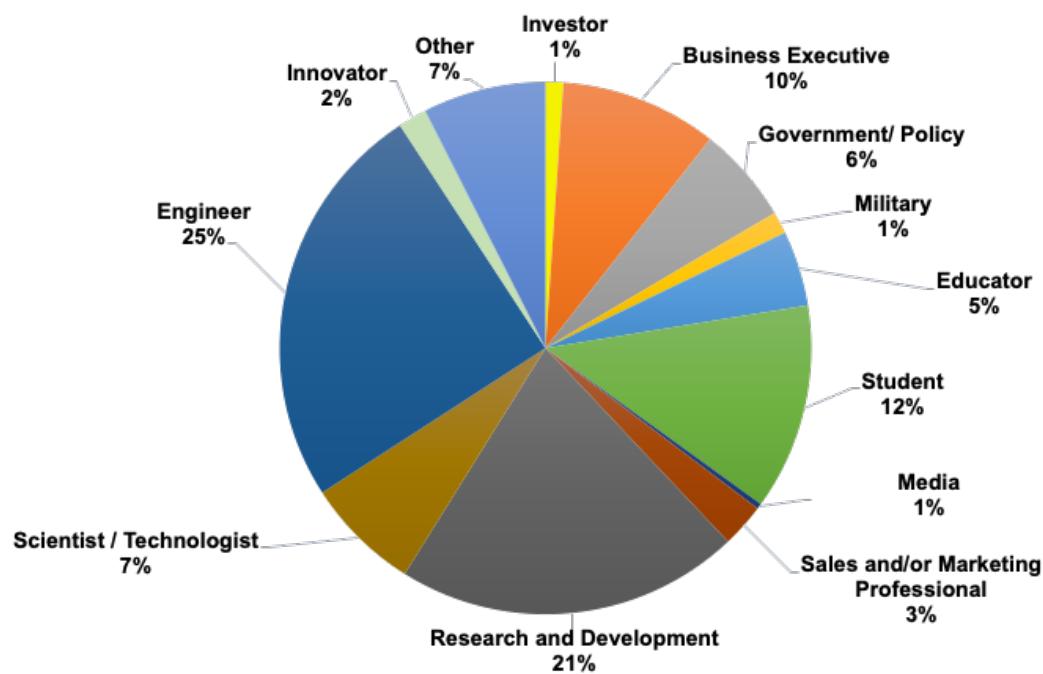
Example: Paper presentations to address/propose solutions for funding and regulatory challenges in space science.

ASCEND is About Outcomes!



- **Briefings planned:**
 - Congressional Staff
 - National Space Council

Representing the Entire Space Community



- **Registration and Attendance**
 - Over 1300 Registered
 - 6 Webinars/Workshops, 3 Summits led to over 4000 attendees
- **600+ Organizations**
- **Endemic Organizations**
 - Includes: NASA, Boeing, Lockheed Martin, Northrup Grumman, SpaceX, Blue Origin
- **Non-Endemic Organizations**
 - Includes: Google, World Bank, Maui Economic Development Board, Goodyear Tire & Rubber Company, Artwork by Rouch, Ripple, and Urban Logic
- **14 Organizations Sending 10+ people**
- **125+ Colleges and Universities**
- **37 Limited Liability Corporations (LLCs)**
- **22 Countries**

ASCEND November 16-18



- **200 Sessions across three themes**
 - Near-term commercialization
 - Long-term human exploration and settlement
 - Space Policy and National Security

Space Life Sciences and Systems Technical Sessions and Panels

- Bridenstine and Lueders Keynote
- International Heads of Agencies
- Future of Space Medicine
- Crew Health and Life Support
- Artificial Gravity
- Space Habitats, Spacesuits, & Analogs
- Crew Nutrition and Food
- Key Technologies for Human Settlement

Transformative Technologies

- Exploration Technologies
- Human-Machine Teaming
- Independence from Earth-based supply lines





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AERONAUTICS AND ASTRONAUTICS



ASCENDxWebinars and Workshops

- ASCENDxWebinar: Building Our Off-World Future – 29 May
- ASCENDxCo-Lab: Staking Your Claim to the Trillion-Dollar Space Economy – 23 June
- ASCENDxWebinar: Diversity, Equity, and Inclusion in the Aerospace Community and Workforce, Part I – 15 July
- ASCENDxWebinar: Diversity, Equity, and Inclusion in the Aerospace Community and Workforce, Part II – 21 July
- ASCENDxCo-Lab: Economically Viable Lunar Settlement – 29 July
- ASCENDxWebinar: Space Policy: The Road Ahead – 26 October



ASCENDxSummits

- ASCENDxSummit on Space Science & Technology – 19 August
 - 45 Speakers across 5 Tracks
 - Keynote: Thomas Zurbuchen
- ASCENDxSummit on National Security Space – 17 September
 - 52 Speakers across 5 Tracks
 - Keynote: Steve Isakowitz
- ASCENDxSummit on Space Policy and Education – 21 October
 - 80 Speakers across 6 Tracks
 - Keynote: Tory Bruno and Heather Wilson