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Space Architecture: Habitats, Habitability, and Bases (1)

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MISSION: ASTROACCESS — APPLYING THE PRINCIPLES OF UNIVERSAL DESIGN TO SPACE ARCHITECTURE

Abstract

On October 17th, 2021, Mission: AstroAccess successfully launched twelve ambassadors with mobility, vision, and hearing disabilities on a historic ZERO-G parabolic flight, as the first step in a progression toward flying a diverse range of people to space. This crew consisted of disabled scientists, veterans, students, athletes, and artists. During the flight, the ambassadors conducted microgravity demonstrations to understand how space architecture can be made more accessible through intentional design and procedure modifications. These tests included new visual and haptic feedback mechanisms to signify phases of flight, crew uniforms intentionally designed for accessibility, interior customizations to provide instantaneous location and orientation awareness for safety in microgravity, and a variety of additional scientific and technical demonstrations.

As a human race, our most intractable challenges —poverty, climate change, pandemic— happen on a global scale. Space exploration puts that scale into perspective and calls us to reimagine what divides and connects us as people. Mission: AstroAccess is dedicated to advancing disability inclusion in space exploration, not just for the benefit of marginalized communities, but for the benefit of all humankind. By incorporating principles of universal design into future spaceflight activities, we can develop and test modifications made for the nominal benefit of disabled people that simultaneously make spaceflight safer, more efficient, and more accessible for everyone.

This session will share the findings from Flight 1 as well as new details on our upcoming Flight 2, taking place with ZERO-G at the end of 2022. This session will also showcase essential accessibility considerations for future space stations and share best practices on inclusive space station design, calling for a change in industry standards. Designing space stations with disability in mind is not a risk but rather a form of risk mitigation. Participants will gain a new perspective on access and universal design as valuable tools that have the power to transform the next generation of space vessels. By understanding and implementing accessible design, the space industry can welcome the talent, skills, and unique perspectives of the one billion people with disabilities on earth who are currently excluded from human space exploration. Breaking down these barriers will enrich space research and pave the way for a more

equitable future on earth and beyond it. Outer space is not just humanity's future: it is a call to rethink life on earth today.