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ASTROACCESS: IMPROVING HUMAN SPACEFLIGHT THROUGH UNIVERSAL DESIGN

Abstract

AstroAccess is a non-profit initiative dedicated to making space exploration accessible to all people. Since 2021, AstroAccess has participated in five zero-gravity parabolic flights demonstrating developments and technologies designed and tested by disabled scientists, engineers, veterans, students, athletes, and artists for use in space. This program focuses on the introduction of Universal Design to space architecture, operating under the primary principle that by designing for the widest use cases possible, space systems can be made safer and more efficient for everyone. AstroAccess Ambassadors are an international community of disabled researchers who are competitively selected to perform microgravity demonstrations. These tasks investigate how intentional design and procedure modifications can improve both space accessibility and space architecture as a whole.

This session will share findings from the recent AstroAccess Flight 2 that took place with ZERO-G at the end of 2022. Conclusions will be shared from technologies tested onboard, including tactile graphics intended for use onboard air- or space-craft for non-visual navigation in case of an emergency inhibiting sight, an LED lighting system for signaling upcoming changes in gravity through non-auditory means, sign language comprehension tests in microgravity, five-point harness seat docking drills for blind and mobility ambassadors to demonstrate independently getting in and out of a simulated suborbital spaceflight seat, wearable anchoring experiments, and many more. 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.