

**ASE XXXII Planetary Congress
October 14 – 18, 2019
Houston, USA**

Final Report



"Celebrating Apollo – Inspiring the Future"

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More than one hundred twenty astronauts and cosmonauts from nineteen countries gathered in Houston, Texas 14-18 October, 2019 for the XXXII ASE Planetary Congress. Hosted by former astronaut Bonnie Dunbar, the theme of the Congress was "Celebrating Apollo – Inspiring the Future". The week-long event featured a variety of technical sessions, cultural events, and educational outreach across the state of Texas. The Title Sponsor for the XXXII Congress was the Texas A&M University.



The Congress officially opened on Monday October 14th at Space Center Houston, the official visitors' complex for the NASA Johnson Space Center. Astronaut and cosmonaut delegates, their spouses, local members of the international diplomatic corps, and distinguished guests were welcomed with remarks by NASA Johnson Space Center Director Mark Geyer, XXXII Congress Chair Bonnie Dunbar, ASE-USA president Steve Oswald, ASE president Michael Lopez-Alegria, Houston Mayor Sylvester Turner and Texas A&M University Chancellor John Sharp. During his remarks, Lopez-Alegria asked for a moment of silence in commemoration of the astronauts and cosmonauts who had passed away since the last Congress in Minsk.

Opening Ceremony also featured a recorded message and best wishes from the crew of Expedition 60/61 onboard the International Space Station, as well as a video message from NASA Administrator Jim Bridenstine. Lopez-Alegria concluded the ceremony by reading a welcome letter from US vice-president Mike Pence.

After lunch, the delegates conducted the Theme Session of the Congress. Titled "The Impact of Apollo, Today and Tomorrow" and chaired by ASE president Michael Lopez-Alegria, the session focused on the Apollo Program's impact on developing technology for both space travel and public benefit and featured a panel discussion with retired NASA Flight Director and Director of Human Spaceflight Wayne Hale, former astronaut and Senior Research Scientist at Florida Institute for Human and Machine Cognition, Dr. Tom



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Jones and Dr. Jennifer Levasseur, curator at the Smithsonian National Air and Space Museum. The panel discussed their memories and public perceptions of the Apollo 11 moon landing, and how those perceptions might serve to enable or inhibit future endeavors in human deep space exploration.

The first technical session of the Congress discussed Medical Challenges and Solutions Beyond Low Earth Orbit. Dr. Bonnie Dunbar opened the session by introducing the panel of speakers, including session co-chair Dr. John Charles, retired cosmonaut Oleg Kotov, Dr. Richard Jennings from the University of Texas Medical Branch, former astronaut Dr. Andre Kuipers, former JAXA astronaut Dr. Chiaki Mukai, Dr. Sue Bloomfield, professor at Texas A&M University, and Kat

Coderre, Advanced Programs Engineer at Lockheed Martin. The panel discussed medical solutions, opportunities and challenges for human operations beyond low-earth orbit.

While the fliers were in session, the companions were treated to a tour of the Mission Control Center, the newly-refurbished historic Mission Control, and the Space Vehicle Mock-up Facility at the NASA Johnson Space Center. That evening fliers, guests and companions enjoyed an evening dinner at the nearby Villa Capri restaurant, featuring musical entertainment provided by astronaut band Max Q.

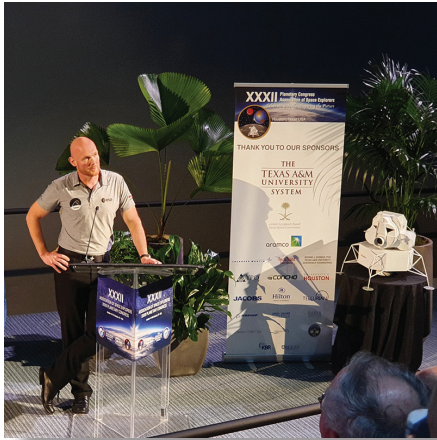


On Tuesday, the first technical session of the day featured "The Apollo Experience". Held at NASA's Johnson Space Center, Center Director Mark Geyer hosted a panel with Apollo 7 astronaut Walt Cunningham, Apollo 13 astronaut Fred Haise, George Abbey, former Director of Johnson Space Center and Apollo Flight Director Gerry Griffin. The panelists shared their experiences throughout the Apollo Program and offered their opinions on the next steps in space exploration, and the viability of current plans public and private sector plans for exploration beyond LEO.



After lunch with JSC employees, the fliers reconvened for the next technical session, "Forward to the Moon," at Space Center Houston. The joint ASE-IAF session focused on international planning for human lunar exploration activities, including NASA's Gateway Program and other essential components of the proposed architectures. IAF Executive Director Christian Feichtinger introduced Dan Hartman, NASA Gateway Program Manager at JSC, who expanded on NASA's contribution

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to the deployment of Gateway components and their utilization as part of the Artemis Phase I Program. ESA astronaut Alexander Gerst, JAXA astronaut Koichi Wakata and CSA astronaut Jeremy Hansen briefed their respective agency contributions to the Gateway Program and the joint plans for exploring uncharted regions of the lunar surface.

The final technical session of the day, "The Next 50 Years: Challenges for Future Exploration" was chaired by former astronaut and ASE-USA president Steve Oswald. Dr. Haitham Abdulaziz Altwaijri of the Saudi Space Research Institute began with a presentation on the past accomplishments, present technologies, and future exploration goals of the Kingdom of Saudi Arabia. NASA Deputy Associate Administrator for Exploration, Stephen Clark, expanded upon Gateway's activities to pursue exploration beyond Low Earth Orbit and the timetable of deliverables necessary to achieve a sustainable US presence on the moon by 2028.

The session ended with a panel entitled "The Nautilus Paradigm" Space Power and Propulsion For the Next 50 Years. Moderated by former astronaut, Dr. Franklin Chang Díaz, CEO, Ad Astra Rocket Company, the panel included Dr. Ronald Litchford, Principal Technologist, Game Changing Development Program, Office of the Chief Technologist, NASA HQ; Dr. Dennis Whyte, Nuclear Science & Engineering Professor and Director, MIT Plasma Science and Fusion Center; Dr. David I. Poston, Nuclear Design and Risk Analysis Group, Los Alamos National Laboratory; and Capt. Stephen G. Bowen, Astronaut / US Nuclear NAVY. The group discussed high-power nuclear electric propulsion as the key enabler for sustainable human deep space exploration.



That evening, the delegates were hosted by Young President's Organization (YPO) and treated to a western barbeque dinner under the majestic Saturn V exhibit at JSC's Rocket Park.

Wednesday was the traditional Congress Community Day, and the astronauts and cosmonauts traveled to schools, universities, scientific institutions and space-related companies to visit with students, teachers and community leaders across the state of Texas.



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ASE member André Kuipers's SpaceBuzz was a welcome addition to this year's Congress. SpaceBuzz is a non-profit educational program with the mission to inspire school children worldwide to become ambassadors of planet Earth through experiential learning, teaching them about space, planet Earth and STEM. The vehicle is packed with the latest VR and 4D technology, enabling children to experience the overview effect, just like astronauts experience in space.



On Thursday morning, the fliers assembled at the Rice University Baker Institute of Public Policy for a technical session focused on "Developing Exploration Technologies on the International Space Station". George Nelson, Manager of the Technology and Science Research Office, NASA ISS Program Office, presented an overview of the latest technological developments being tested on the ISS and how NASA plans to implement them into future exploration

missions. James Broyan, NASA Advanced Exploration Systems Logistics Reduction Manager, briefed the shortcomings of previous and current waste management systems used on Shuttle and the ISS and introduced the new Exploration Toilet currently under development. Former astronaut Reinhold Ewald introduced the Stuttgart Photobioreactor Experiment, intended to utilize particular algae species that can efficiently convert CO₂ into breathable oxygen. He described the elements of the experiment and key results noted from trials conducted on the ISS.

Laura Shaw, NASA ISS Exploration Life Support Systems, detailed new functions and recent improvements to the Environmental Control and Life Support System (ECLSS), intended to be implemented for future expeditions to Mars. Eugene Schwanbeck, ISS Solar Array Project Manager elaborated on the detailed design for the new roll out solar array system (iROSA) and how iROSA will be deployed and installed on the ISS and future crewed vehicles.

After lunch, Chris Hansen, Manager of the NASA Extravehicular Office, opened the session "Space Suit Development for Future Exploration" with a discussion of NASA's Exploration Extravehicular Mobility Unit (xEMU) and the plans for a first space test in March 2023. The session also featured a panel consisting of former astronaut Dan Burbank, Joe McMann, a retired NASA EVA suit engineer and NASA astronaut Kathleen Rubins, who fielded questions about the shortcomings of the current EMU used on the ISS. The panel also discussed improvements in the new xEMU suit that will enhance mobility, fit, and communications.



The second afternoon session, "Crew Safety and Technical Issues," opened with a briefing by astronaut Mark Brown on the importance of advanced space traffic

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management (STM) for crew and vehicle safety. Dan Oltrogge, Director of AGI's Center for Space Standards and Innovation, followed with a discussion of space situational awareness. Former astronaut Ed Lu, closed the session with a demonstration of a space surveillance network that can be utilized to predict near-misses and prevent vehicle/debris conjunctions.

Thursday ended with an Awards Dinner at the Museum of Fine Arts Houston, hosted by HRH Prince Sultan bin Salman, the Saudi Space Commission and Aramco. During the gala event, ASE awarded its Planetary Award, the Crystal Helmet, to Dr. Christopher Kraft, Jr. (posthumously), and a Leonov Medallion to John Sharp, Chancellor of Texas A&M University System.



Friday morning, the fliers gathered for regional chapter meetings and the General Assembly, re-electing Pavel Vinogradov and Andre Kuipers and welcoming David Saint-Jacques as a new member of the Executive Committee. Following the General Assembly, the Executive Committee met and elected Oleg Kotov to replace outgoing ASE president Michael Lopez-Alegria. Friday afternoon, the fliers and companions visited the nearby Lone Star Flight Museum for a tour featuring a variety of historic airplanes, and a Wings Over Houston airshow preview.

XXXII Congress Awards

ASE Planetary Award - Crystal Helmet

Dr. Chris Kraft, Jr. (posthumous)

Leonov Medallion

Chancellor John Sharp
Texas A&M University

Lois & Richard Richards

Perchatka (Best Technical Presentation)

Edward Lu

The Closing Ceremony and dinner took place Friday evening in Space Center Houston. The newly announced Executive Committee welcomed Oleg Kotov as the new ASE president and awarded the Perchatka - awarded by vote of the membership for the best technical presentation of the Congress - to Ed Lu for his presentation on space traffic management. ASE also recognized Lois & Richard Richards with a Leonov Medallion for their outstanding contributions to the organization of this year's Congress. A special gift was presented to Congress Chair Bonnie Dunbar for her efforts in organizing this year's Congress; Dunbar then read a proclamation from the Mayor of Houston, Sylvester Turner, recognizing October 16, 2019, as XXXII Planetary Congress Day. In the final official act of the XXXII Congress, Dunbar passed an ASE flag to Hungarian cosmonaut Bertalan Farkas,

who invited ASE members to Budapest, Hungary in 2020 for the XXXIII Planetary Congress.

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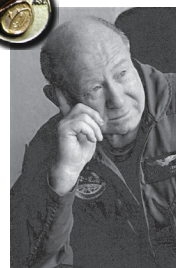
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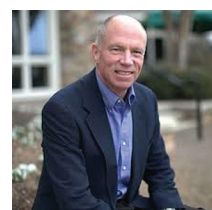
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**XXXIII Planetary Congress
September 27 – October 3, 2020
Budapest, Hungary**

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