

Space is  
my future!

L'espace est mon futur  
Космос – моё будущее



*XXX Congress Report*

# XXX PLANETARY CONGRESS · FRANCE · 2017



(Front row, left to right) Scott Altman, Rick Hieb, Alexander Samokutyaev, Danny Olivas, Jean-François Clervoy, Thomas Pesquet, Alexander Alexandrov, Soichi Noguchi, Bonnie Dunbar, Michel Tognini, Michael Lopez-Alegria, Sultan bin Salman, Alexander Aleksandrov, Vladimir Kovolyonok, Alexander Ivanchenkov, Jean-Loup Chrétien, Owen Garriott, John Fabian, Viktor Savinykh, Julie Payette, Nikolai Budarin, Klaus-Dietrich Flade, Jeff Williams, Drew Gaffney, Stephanie Wilson, Andrei Borisenko

(Second row) Brian Duffy, Mark Brown, Sergei Avdeev, Valeri Tokarev, Salizhan Sharipov, Pam Melroy, John Grunsfeld, Mike Foreman, Drew Feustel, Sergei Krikalev, Oleg Kotov, Vladimir Remek, Pedro Duque, Claudie Haigneré, Oleg Skripochka, Richard Garriott, Charlie Walker, Dorin Prunariu, Bo Bobko, Reinhold Ewald, André Kuipers, Ulrich Walter, Cady Coleman, Kevin Kregel

(Third row) Tony Antonelli, Bruce McCandless II, Mary Ellen Weber, Takuya Onishi, Yuri Gidzenko, Gerhard Thiele, Susan Helms, Yuri Usachev, Jim Voss, Bob Cabana, Sergei Revin, Mirosław Hermaszewski, Jan Davis, Franco Malerba, Leonid Kadenyuk, Ernst Messerschmid, Kate Rubins, Vladimir Titov, Mike Fincke, Franz Viehbock, Alexander Balandin

(Back row) Carl Walz, Sam Gemar, Sergei Zalyotin, Rex Walheim, Philippe Perrin, Valeri Korzun, Bill Readdy, Stephen Oswald, Mario Runco, Jr., William McArthur, Tom Jones, Anatoli Artsebarskii, Pavel Vinogradov, Jean-Pierre Haigneré, Ulf Merbold, Oleg Atkov, Greg Olsen, Ken Reightler, Jr., Shannon Lucid, Janet Kavandi, Jean-Jacques Favier, Yuri Baturin, Bertalan Farkas

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*As the only professional association for astronauts, ASE supports the advancement of space exploration by providing opportunities for communication among space professionals at the international level. The Association works closely with other international professional space organizations to expand and invigorate international dialogue on such issues as asteroid impact threats and hazards as well as international cooperation and on-orbit compatibility, crew safety, human performance and rescue. ASE regularly sponsors international discussions among astronauts on space flight operations.*

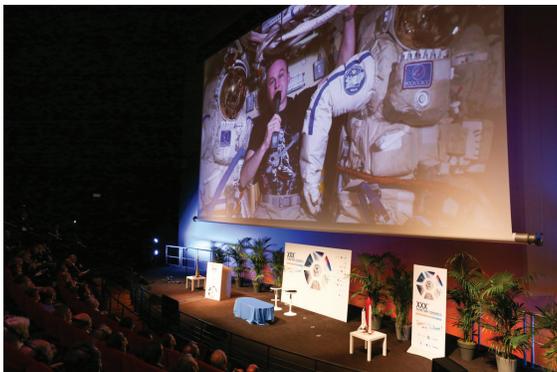
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Ninety-seven astronauts and cosmonauts from 16 nations gathered October 16-20 in Toulouse, France for the XXXth Planetary Congress of the Association of Space Explorers. Hosted by French astronaut Michel Tognini and organized by the Cité de l'espace under the patronage of the City of Toulouse, the theme of the Congress was "Space is my Future."



The XXX Congress officially opened on Monday, October 16 at Cité de l'espace. Director General Jean-Baptiste Desbois and principal Congress organizer Philippe Droneau welcomed the fliers, spouses and distinguished guests on behalf of the Cité de l'espace, provided a brief overview of the week's events and introduced Congress host Michel Tognini. Tognini welcomed the delegates and described the goals of ASE's week-long meeting in Toulouse and noted that the first ASE Congress was held 33 years ago in Cernay, France. After thanking the Cité de l'espace and the Congress sponsors, Tognini declared the Congress officially open and introduced ASE President Bonnie Dunbar.

Dr. Dunbar welcomed the fliers and guests and recounted her own sources of inspiration in French author Jules Verne; she noted that civilizations that have survived throughout history have been energetic, inquisitive, had never failed to go into the unknown, even if at great risk, and had always shared great visions of the future. She reviewed some of the primary activities the ASE engages in to inspire future generations of explorers worldwide and noted that the fliers would be meeting with students all over France during the traditional Community Day activities on Thursday. Dr. Dunbar concluded her remarks by remembering the many contributions of the six recently deceased astronauts and cosmonauts and called for a moment of silence in their memory.



After a musical interlude, Jean-Baptiste Desbois introduced the Mayor of Toulouse, Jean Luc Moudenc, who recognized the major Congress sponsors, welcomed the fliers and spouses and described the central role of Toulouse in the development of European aerospace and astronautics. After the Mayor's remarks, the attendees received a pre-recorded greeting from the crew onboard the International Space Station. Jean Yves Le Gall, president of CNES took the podium next and described the role of CNES in the success of European space efforts and expressed his confidence that the

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Congress would have a significant impact on students all across France.

Johann Woerner, the new Director General of ESA followed with a videotaped greeting, expressing his gratitude for the efforts of the astronauts and cosmonauts in the pursuit of international cooperation in space. Nicolas Chamussy, Head of Space Systems at Airbus spoke next and described the excitement in Toulouse for the opportunity to welcome the astronauts and cosmonauts into the many academic and technical venues they will visit over

the week. In a preview of his keynote speech later that morning, Swiss explorer and Solar Impulse pilot Bertrand Piccard followed with a brief yet impassioned plea for the fliers – and all citizens of planet Earth – to raise their voices in defense of planet Earth.

The Opening Ceremony concluded with a brief presentation by Bonnie Dunbar and Michel Tognini, who awarded an official Congress patch to Marwa Guermon for her role in creating the theme of the XXXth Congress – “Space is my Future”.

After a light lunch under the MIR space station mockup at Cité de l’espace, the fliers reconvened for the two-part Congress theme session.



The first Theme Session was chaired by CNES Deputy General Manager Lionel Suchet, who remarked on the history of French astronautics and noted that collaboration has always been a critical part of European human spaceflight efforts. Suchet noted that inspiration is an important part of creating the future aerospace workforce, and that exploration and explorers provide that source of inspiration to the following generations. Suchet introduced Keynote Speaker Bertrand Piccard, who recounted his experiences with the Solar Impulse project, and encouraged the audience to think in three dimensions about life, and about ways to behave, and about ways to understand the world. Piccard noted that a three dimensional vision of the future better serves the cause of creativity and innovation.

Suchet then introduced new ASE member and French astronaut Thomas Pesquet, who discussed current activities and his own recent experiences on the ISS. Pesquet noted that the lessons being learned in low earth orbit are designed to support exploration beyond LEO and to the Moon and stressed that the international collaboration needed to build and maintain the ISS will be essential to future deep space



exploration. ASE Crystal Helmet awardee Sylvestre Maurice followed and discussed the importance of mutually supporting robotic and human exploration of Mars. CNRS Senior Researcher François Forget reported next on the search for exoplanets and described future missions to more accurately characterize the incredible diversity of extra-solar planetary systems. The first part concluded with a panel discussion among the speakers with questions from the audience.

Lionel Suchet opened the second part of the theme session,

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“Home Planet Watchers”, introducing biologist Gilles Boeuf who discussed biodiversity and the evolution of life on Earth; he also identified at-risk areas of the planet where climate change has had measurable impacts. ESA Climate Office Director Pascale LeCompte followed with a description of the evolution of debate with regard to climate change, climate awareness and planetary stewardship and noted that more data were needed from space to better characterize observable phenomena.

Thomas Pesquet returned to the podium and described his experiences in orbit, and his reactions to viewing the Earth from space. He showed some of his space photography and noted that after his flight, he was more aware of the fragility of the planet and more aware of our collective responsibility to take care of it. The session concluded with a panel discussion with questions from the audience.

While the fliers were in session the companions and guests were treated to a guided tour of the Cité de l’espace and enjoyed an afternoon touring the exhibits and attractions. Monday evening the fliers, spouses and guests were treated to an informal reception and buffet in the Toulouse City Hall.

On Tuesday morning the delegates returned to the Cité de l’espace for a day of technical sessions and a tour of the facility and space exhibitions. The first technical session, Late Breaking News from Space (part 1) was co-chaired by JAXA astronaut Soichi Noguchi and Russian cosmonaut Alexander Alexandrov and focused on the latest achievements of the human space programs of the International Space Station partners. Noguchi introduced his co-chair and welcomed NASA astronaut Kate Rubins and JAXA astronaut Takuya Onishi to the stage. Rubins and Onishi presented their Expedition 49 post flight



report, noting that their flight was a perfect example of the benefits of embracing international cooperation in space.

Onishi introduced the Expedition 48 and 49 crew members in the hall and the two crewmates then narrated their post flight video from launch to landing. Onishi noted the exceptional value of ISS as a platform for inspiring students to compete for opportunities to fly experiments into space.

After an exchange of questions and answers from the audience, Rubins followed with a presentation on science in extreme environments and the research capabilities of the ISS. Rubins described the benefits of being able to examine fundamental differences of physical and biological processes in microgravity and the development of technologies that allow real time processing of results from experiments currently onboard the ISS.

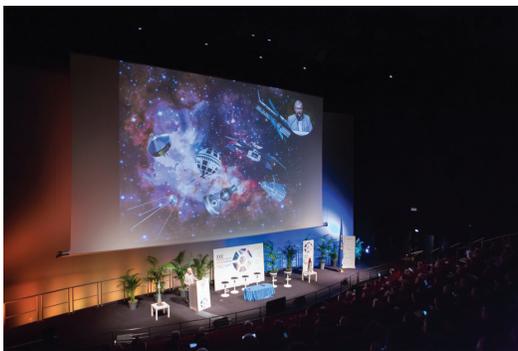


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Noguchi then introduced Patrice Benarroche of CNES, who reported on current and planned activities in CADMOS, CNES's payload control center, supporting experiments in life sciences, material? sciences, fundamental physics, life support and new technologies for human spaceflight and exploration. Muriel Deleuze, also from CNES, followed with a detailed report on the Mars Curiosity rover and plans for the Mars 2020 mission, and Ayami Kojima of the UN Office of Outer Space Affairs concluded the session with a report from UNOOSA on their efforts to build capacity in microgravity science education and research in underdeveloped countries via the Human Space Technology Initiative.

In the second half of the two-part session, cosmonaut Alexander Alexandrov opened by recalling the moving experience of his own spaceflight experiences and congratulated the speakers on bringing those memories alive with their excellent presentations. Alexandrov then introduced recently-flown Russian cosmonaut Andrei Borisenko, who provided an overview of recent Russian science aboard the International Space Station and a report of the activities of his crew on ISS Expeditions 49 and 50. Narrating his flight video, he noted the particular importance of international cooperation in maintaining crew effectiveness throughout the training and flight flow.



ASE-Russia president Alexander Alexandrov followed by recalling the recent 60<sup>th</sup> anniversary of the launch of Sputnik and segued into the history of the development of the early Soviet spaceflight technologies, presenting a detailed report on the development, launch and flight of Sputnik in October, 1957. Alexandrov noted that the political pressures that drove the early space race resulted in accelerated development of the technologies that eventually enabled human spaceflight.

Russian cosmonaut Yuri Gidzenko concluded the morning's activities with a discussion of the history, current status and prospects for scientific research aboard the various human inhabited or tended space complexes in LEO and beyond. Gidzenko noted that the strategic goals of cosmonautics are the improvement of life on earth, the expansion of the human presence in space, and the search for extraterrestrial life. Gidzenko also presented a roadmap for future international missions beyond low earth orbit and presented Russian plans for future ISS utilization and follow-on vehicles.

After lunch at the Cité de l'espace Astronaut Café, the fliers reconvened for the joint ASE-IAF session titled "The International Space Station – Its Rewards and Challenges." The session highlighted the challenges in maintaining a space station in Earth orbit for extended periods and described the rewards of overcoming these challenges.



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German astronaut Reinhold Ewald opened the session introduced his co-chair Christian Feichtinger who said a few words about the International Astronautical Federation and noted that many members of the Federation, including ASE, were represented in the hall. Ewald then introduced ESA Increment Manager Alexander Nitsch, who discussed the challenge of planning and logistics of sending supplies to the ISS, remarking that the planning, launching and operations was similar to operating a train station – “understanding the schedule is the challenge, and the reward is operations happening in line with the flight plan and generating results”.

NASA astronaut Jeff Williams followed with a description of the equally challenging logistics of receiving supplies in space and provided an overview of visiting vehicle traffic during ISS Expeditions 46 and 47; he also discussed some of the challenges of transfer and stowage, adding that the rewards often took the form of care packages and other fresh food items for the crews.

Christian Feichtinger then introduced NASA astronaut Kathleen Rubins who discussed DNA sequencing on the International Space Station. Rubins reviewed the early stages of molecular research capability on the ISS and noted that the ability to do biological assays in space and in real time has amplified the value of the research results. Rubins described the Biomolecule Sequencer Payload and the Genes in Space-3 payload experiment currently onboard the ISS and noted the additional value of onboard sequencing for operational environmental monitoring, microbiology research, medical operations and astrobiology science investigations.



Reinhold Ewald next introduced Professor Hervé Cottin of the Université Paris-Est Créteil, who discussed current astrobiology, exobiology and bioastronomy research onboard the ISS. Cottin noted that the International Space Station is a uniquely-suited environment to conduct experiments related to the study of life and its origins, providing a simulation of extraterrestrial environments such as vacuum and solar radiation and the ability to perform long-duration exposure of chemical and biological materials to the extreme environment of space. The session concluded with a question and answer period with the panel of speakers.



The last technical session of the day was chaired by ASE president Bonnie Dunbar, who opened the session with a history of the Chinese human spaceflight program, a current status of their astronaut corps and space station operations and some insight into their future plans for lunar exploration. The session featured a presentation by CNRS

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geographer Isabelle Sourbes-Berger, who discussed Chinese capabilities and Chinese ambitions for exploration and utilization of space for industrial and national development.

CNES International Relations Deputy Director Pascale Ultré-Guerard spoke next and presented an overview of cooperation between France and China in space activities; she reviewed several ongoing cooperative scientific investigations between CNES and China and described plans for future cooperation in Earth science, space science, space and life sciences, climate change research, and lunar and deep space exploration.

CNES Orbital Systems representative Philippe Lier followed with a report on cooperation with China in the area of human spaceflight, including medical research onboard the Tiangong-2 and future Chinese space stations. To conclude the session, Dunbar led the speakers in a panel discussion responding to questions from the audience on Chinese activities in space and the challenges and rewards of cooperation with them.

While the fliers were in session at Cité de l'espace, the companions and guests enjoyed a guided visit to Lastours and the famous French walled city of Carcassone, arriving back in time to meet their spouses for a gala dinner and award ceremony at the picturesque Hotel Dieu on the banks of the Garonne River.

Following a short reception and welcome remarks in the 12th century antechamber, the ASE Executive Committee awarded physicist Sylvestre Maurice the Crystal Helmet for his contributions to a better understanding of the chemistry of Mars through his work on the Curiosity Rover's ChemCam. Dunbar and Tognini also recognized the individual Founding Members of the Association in attendance, and the new members and first time Congress attendees were awarded their ASE logo lapel pins.



On Wednesday, the spouses and companions enjoyed a morning off while the fliers boarded busses for Airbus, where the final technical session of the Congress was held. Co-chaired by astronauts Michael Lopez-Alegria and André Kuipers, the session addressed the most recent developments in future human spaceflight programs. Astronaut and industry representatives discussed both government and commercial endeavors, as well as the major achievements and significant challenges they will face in the future.



ESA astronaut André Kuipers opened the session on the Future of Human Spaceflight, held in the Airbus headquarters

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auditorium, noting how hard it has historically been to predict the efficacy of new or future technologies; Kuipers then introduced NASA astronaut Jeffrey Williams, who discussed Commercial Crew Program activities in 2017. He also reviewed plans for integration of the commercial crew and cargo schedules into the ISS program schedule.

Russian cosmonaut Oleg Kotov followed with a presentation on the ROSCOSMOS vision for orbital outposts after ISS and lunar and deep space exploration. Former astronaut and ASE-USA president Michael Lopez-Alegria followed with a report on the efforts of Axiom Space to build and deploy a purely commercial space station in low-Earth orbit, noting that the effort would require redefining public private partnerships in human spaceflight activities.



After a short coffee break, Oliver Juckenhöfel, AIRBUS Vice-president On-Orbit Services and Exploration described his company's contributions to the Orion program as well as the benefits of creating economies of scale in bringing down the cost of robotic and human exploration of the Moon and near Earth space. French astronaut Philippe Perrin presented a short briefing on the test program for the Airbus A380 aircraft, and astronaut Claudie Haigneré concluded the session with a presentation on her vision for a Global Exploration Roadmap to support a cooperative approach to developing an international habitable facility – a Moon Village – on the lunar surface.



After lunch and a panoramic tour of the Airbus campus and assembly lines the fliers rejoined their companions for an afternoon guided tour of Toulouse and some free time for sightseeing on their own.



Thursday was the traditional Congress Community Day, and the astronauts and cosmonauts travelled to 42 different schools, universities and scientific institutions in Bordeaux, Castanet, Castres, Fleurance, Nantes, Paris, Labege, Lyon, Marseille, Montpellier, Revel, Saint Orens, Nice, Tarbes, Toulouse, Tournefeuille, Valence d'Agen and a host of local villages to visit with students, teachers and community leaders. The fliers travelled in pairs to meet with students engaged in technical projects or programs that were selected from among hundreds of proposed candidates.

# Community Day



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Friday morning, ASE working groups on Near Earth Objects, International Astronaut Longitudinal Health and Space Traffic Management met to discuss future committee activity and to prepare reports for the Executive Committee and General Assembly, held later that afternoon at Cité de l'espace.

After the regional chapter meetings, the fliers gathered for the General Assembly and approved modifications to the ASE Charter, approved forward action by the ASE working groups, approved Minsk, Belarus as the host of the XXXI Planetary Congress, and elected Gerhard Thiele and Pavel Vinogradov to replace outgoing Executive Committee members Reinhold Ewald and Anton Shkaplerov. John-David Bartoe was also re-elected to a three-year term on the international Executive Committee. Following the General Assembly, the new Executive Committee met and re-elected Bonnie Dunbar as president of the international ASE.

The Closing Ceremony and dinner took place Friday evening in the Australis Hall of the Cité de l'espace. Bonnie Dunbar and Michel Tognini opened the ceremony by announcing the newly elected Executive Committee, followed by a presentation of the Perchatka (The Glove) – awarded by vote of the membership for the best technical presentation of the Congress – to NASA astronaut Kathleen Rubins.



The Executive Committee then announced Dumitru-Dorin Prunariu and Thomas Stafford as newly selected Distinguished Members of the ASE and awarded Prunariu his DM lapel insignia. Michel Tognini was awarded a Leonov Medallion for his efforts as host of the XXX Congress, and a second Leonov Medallion was awarded to ASE Executive Director Andy Turnage for his longtime service to the organization. In the final official act of the XXX Congress, Russian cosmonaut Vladimir Kovalyovok took the stage and formally invited the delegates and companions to the XXXI Congress in Minsk, Belarus in 2018.

Following the presentations, Tognini and Dunbar thanked the Organizing Committee for their efforts and hospitality. Jean Baptiste Debois thanked the fliers for the privilege of hosting them at Cité de l'espace and recognized the many volunteers who worked tirelessly to make the Congress a success, after which Michel Tognini officially declared the Congress closed and invited the guests to the final Closing Banquet.



*The Association in particular thanks Jean-Baptiste Desbois, Philippe Droneau, Sandra Henry-Baudot, Tiphaine Duval, Julie Phelipot, Florence Seroussi and the many volunteers for their extraordinary efforts and support on behalf of the ASE XXX Congress. Photo credits: Cité de l'espace, Manuel Huynh, Natalia Lagueny*



**2017 Awards**

**ASE Planetary Award - Crystal Helmet**

*Sylvestre Maurice*

**Leonov Medallions**

*Michel Tognini*

*Andy Turnage*

**ASE Distinguished Members**

*Dumitru-Dorin Prunariu*

*Thomas Stafford*

**Perchatka (Best Technical Presentation)**

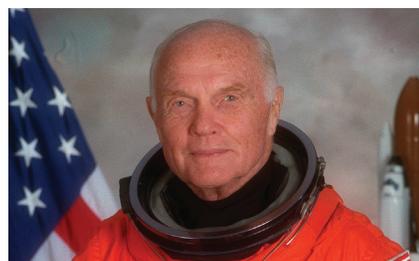
*Kathleen Rubins*

**XXXI Planetary Congress  
September 9-15, 2017  
Minsk, Belarus**

**IN MEMORIAM**



**Eugene Cernan**  
*March 14, 1934 – January 16, 2017*  
*Gemini IX, Apollo 10, Apollo 17*



**John Glenn**  
*July 18, 1921 – December 8, 2016*  
*Mercury Atlas - 6, STS 95*



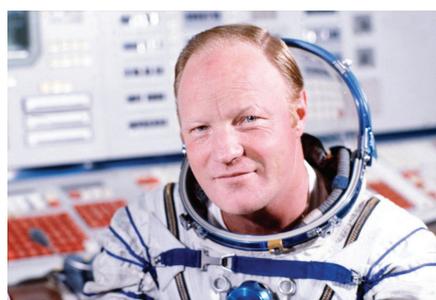
**Viktor Gorbatko**  
*December 3, 1934 – May 17, 2017*  
*Soyuz 7, Soyuz 24, Soyuz 37*



**Georgi Grechko**  
*May 25, 1931 – April 8, 2017*  
*Soyuz 17, Soyuz 26, Soyuz T-14*



**Piers Sellers**  
*April 11, 1955 – December 23, 2016*  
*STS 112, STS 121, STS 132*



**Igor Volk**  
*April 12, 1937 – January 3, 2017*  
*Soyuz T-12*