



THE SPACE EXPLORER

THE NEWSLETTER OF THE ASSOCIATION OF SPACE EXPLORERS • USA January 2001

Spain Hosts XVI ASE Planetary Congress Kazakhstan, Italy to Host XVII and VXIII Congresses

Sixty-three astronauts and cosmonauts from twelve nations gathered in Spain November 13 through 17, 2000 for the Sixteenth Planetary Congress of the Association of Space Explorers. The theme of the Congress was "A New Space for Humanity," reflecting the belief that the new millennium represents a new era of international cooperation in the pursuit of a permanent human presence in space; the XVI Congress was hosted by astronauts Pedro Duque and Michael Lopez-Alegria.

The Opening Ceremony of the Congress took place Monday morning at the Juan Carlos I Congress Auditorium. Following opening remarks by Congress President Pedro Duque, the Vice President of the Spanish Government, Mariano Rajoy, delivered a well received speech. His comments were succeeded by brief statements by ASE co-Presidents Frederick Gregory and Victor Savinykh, and Michael Lopez-Alegria then closed the inaugural session. A brief cocktail reception was held after the reception, and Duque, Lopez-Alegria

see Congress, pg. 3

Incumbents Reelected to ASE-USA Board of Directors

In recent elections to the ASE-USA Board of Directors, Bo Bobko, John Fabian and Charlie Precourt were reelected to a second term on the US chapter's governing body. Bobko and Precourt currently serve as president and vice-president of ASE-USA, respectively, while Fabian also serves as co-president of the international executive committee. The incumbents represent a wealth of experience and commitment and their reelection provides much-needed stability as the organization moves into the new year.

INSIDE

STS 101 EVA Report	2
Space Day Needs You!	5
ConsciousEvolution; The World At One	7
2001 Flight Anniversaries	9
ASE-USA Corporate Members	10

STS 101 EVA Report *by Jim Voss*

I recently returned from a visit to the International Space Station. It was a unique opportunity for me and my space station crewmates Susan Helms and Yuri Usachev to see the place we will be living and working for 6 months next year. We will be the second crew to live and work on the ISS. We were assigned to the STS-101 flight only 2 months before launch to satisfy a need when the original crew was split into two parts. This was done to accommodate a change in the manifest that required one flight before and one flight after the launch of the Russian Service Module. So we joined our shuttle crewmates Jim Halsell, Scott Horowitz, Jeff Williams and Mary Ellen Weber on this repair and provisioning flight to the ISS.

There is much to tell about our flight on Atlantis. The challenge of integrating into a crew that had trained together for 18 months before being split up. The challenge of preparing for a space flight in only 2 months. The challenge of convincing the training and operations communities that our skills learned over the last few years were sufficient to do the job. The four launch attempts are a story themselves with the accompanying frustration with the weather and launch con-

straints as well as the discomfort from lying suited on our backs for hours. The Russians launch in almost any weather so it was interesting trying to explain to my Russian crewmate, Yuri, why we couldn't launch because of winds in Africa. But we did launch and then spent the first few days unpacking, checking equipment and rendezvousing with the Station. The rendezvous was spectacular with the station initially looking like a bright star, then a star with wings, then finally a space station, our future home, which grew larger and larger as we approached until it filled our windows only 3 feet away and we docked to it.

Our first major activity after docking was a spacewalk. It was great! But it was great for different reasons than one might think. I did only 4 training exercises in the neutral buoyancy lab compared with the normal 10 runs in the water. Since the spacewalk was such a success, this small amount of training validates the argument for using skills based rather than task based training for Space Station.

The second reason it was great was because the strongest feeling I had was that this was routine work, very different from the excitement that domi-

see Report, pg. 6

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Houston, TX 77058

*Congress**cont'd from pg. 1*

and NASA Astronaut Franklin Chang-Diaz participated in a one hour press conference for Spanish speaking print, radio and television media.

That afternoon, the first technical session of the Congress, Crew Safety and Technical Issues was hosted by international Committee on Crew Safety and Technology Development co-chairs Frederick Gregory and Gennadi Strelakov. The session included several interesting presentations. Charles Ensign of the Spaceport Engineering and Technology Directorate at KSC discoursed on probabilistic risk assessment techniques as applied to aerospace systems, Jay Buckey reported on new technologies for hearing assessment and voice communications in noisy environments, Scott Gahring of the ISS Independent Assurance Office at JSC gave his organization's perspective on risk assessments with regard to recent technical issues on the international space station, and Rick Husband provided an overview on the status of the CRV/X-38 program; while the fliers were in session, their spouses and other guests of the Association took a city tour of Madrid.

Tuesday morning the delegates attended the second session of the Congress, "Space Exploration as a Driver of New Technologies," at the Ministry of Science and Technology. Hosted by Pedro Duque, the session included remarks by the Secretary of State for Political Sciences and Technology of the Ministry of Science and Technology Ramón Marimón, representatives of Spanish industry including Vincent Gomez of CDTI, Eugenio Galdón of ONO, Álvaro Azcarraga of SENER, Francisco Liceaga of INASMET, Jacinto García Palacios of HISPASAT and Mr. Marimón. The recurring theme of their remarks was that space exploration is a stimulant of popular imagination and serves as a driver of technological

innovation, the benefits of which have far reaching economic, social and cultural impact.

After lunch, the delegates returned to the Ministry for the first of two sessions on the International Space Station. Chaired by US astronaut Steven Smith, this session focused primarily on US activities onboard and contributions to the ISS. In the opening presentation, astronauts Edward Lu and Michael Lopez-Alegria reported on the sequence of ISS assembly missions that have occurred to date, talked briefly about their own missions to the ISS and shared dramatic pictures and descriptions of their EVA excursions on the exterior of the station. Beth Stubbings, a senior engineer in the NASA/JSC EVA Project Office followed with an overview of the spacewalking tools, strategies, protocols, and suit modifications that have been developed to meet the challenges inherent to the assembly of the ISS and in the session's last presentation Frank Longhurst, Columbus Project Manager for ESA reported on the status of the Columbus laboratory and its scientific research facilities; he also discussed ESA's work on the Automated Transfer Vehicle (ATV) and other key ISS elements and systems in the fields of structures, robotics, data management, laboratory support equipment and life support.

While the fliers were engaged in the business of the Congress, the companions traveled to the nearby town of Segovia for the day where they visited the Roman aqueduct, the cathedral, Casa Picos and the Alcazar. Following lunch at the famous Casa Cándido, they returned to Madrid and joined up with the fliers for an evening performance of "Jekyll and Hyde."

Wednesday morning the fliers moved to the College of Aeronautical Engineers for the sec-

see Congress, pg. 4

Congress
cont'd from page 3

ond of the two-part ISS series; chaired by ESA astronaut Reinhold Ewald, the session focused primarily on partner contributions to the station. In his opening remarks, Ewald pointed to the challenges facing future expedition crews in terms of the necessity to train at numerous different facilities on three continents. In the first presentation, Ed Lu highlighted the partners' different ways of doing things and the new methods that have to be developed to meet this training challenge. He also talked about computerized command and control software and procedures that will be used on station, on board storage and item tracking, communication, simulator fidelity, and EVA training.

NASDA astronaut Chiaki Mukai followed with a presentation on the numerous hardware contributions Japan is preparing for the ISS, including the internal and external facilities for experiments and storage, the KIBO module and the HTV transfer vehicle. Former ESA astronaut Ulf Merbold then reported on European plans for utilization of ISS, including a description of the micro-g facilities and other hardware contributions. He also described other path finding experiments such as the Global

Time System for worldwide clock synchronization and the FOCUS ensemble, which provides real-time information on global natural fire catastrophes. Former ESA astronaut Ernst Messerschmid concluded the session with an overview of the ESA Astronaut Center and the activities of the 16 European astronauts in ISS technical development and ESA astronaut flight preparations.

Following lunch at the Royal Opera House (Teatro Real), the fliers returned to the College for the Executive Session, where the internal business of the international association is conducted. Cosmonaut Toktar Aubakirov opened the session with an overview of his plans to host the XVII Congress, to be held in Kazakhstan October 1-8, 2001 and Franco Malerba made a proposal, which was formally approved, to host the XVIII Congress in Italy. Loren Acton and Dumitru Prunariu reported on the ASE-Globetree Foundation partnership, and elections were held in which Alexei Leonov and John Fabian were selected to replace outgoing Executive Committee members Frederick Gregory and Viktor Savinykh. While the fliers were working, the spouses had some free time and finished the day with a visit to the world famous Prado museum.

At the conclusion of the Executive Session, the fliers returned to the hotel for the traditional

poster signing ceremony. That evening, Pedro Duque made a presentation to the general public at the Planetarium of Madrid. Following this, the fliers were joined by their spouses and companions for a reception hosted by the Mayor of Madrid, where Duque and Lopez-Alegria were awarded Leonov Medallions for their efforts in organizing the XVI Congress.

Thursday morning the delegates traveled by train to Valencia on the southeast coast of Spain. Upon arrival the fliers visited the futuristic City of Arts and Sciences, where Russian cosmonaut Sergei Avdeev chaired a session on the Mir space station; meanwhile, the spouses took a guided city tour of Valencia. Back at the City of Arts and Sciences, Avdeev gave a comprehensive overview of the history of the Russian space station program, beginning with the early Salyut stations and culminating with the assembly sequence and operation of the Mir station. Avdeev reported on some of the difficulties inherent with operating and staffing the station over its 13 year life, as well as some of the lessons learned in meeting these challenges. Vladimir Soloviev concluded the session with a report on the Russian plans to de-orbit the station in February of 2001.

see Congress, pg. 6

Space Day Needs You!

Space Day, now in its fifth year, is an international celebration of the accomplishments and opportunities in space exploration. The Association of Space Explorers is one of 60 official **Space Day** Partners who support its mission to advance math, science and technology education. This year, there are several opportunities for you to participate personally in **Space Day 2001...the Odyssey Continues**.

Local Space Day Events

Space Day will officially blast off on May 3rd in communities across the U.S. and Canada. Schools, museums and other community organizations will host educational events where thousands of children will gather to learn about living and working in space – hopefully from experts like you. If you'd like to make a difference with our future space pioneers by sharing your experiences as astronauts, please contact Andy Turnage at (281) 280-8172 or by e-mail at aseusa@aol.com.

Online Questions from "Student Scientists"

In addition to speaking directly to kids, you may wish to answer questions posed online by the "student scientists" tackling the **Space Day 2001 Design Challenges** of living and working in space. The **Space Day** Global Classroom at www.spaceday.com allows students to "Ask the Expert" questions about developing emergency procedures, creating menus for astronauts, and designing a mechanical device for use during space walks. If you would like to volunteer on **Space Day** or answer students' questions online, please contact Andy Turnage at (281) 280-8172 or aseusa@aol.com.

For more information about **Space Day**, please visit www.spaceday.com/what. To access the "**Space Day** Partner Area," including contact information for all other **Space Day** Partners, please visit www.spaceday.com/partners and click "Resources and Materials." The following username and password will grant access to this area:

Username: spaceday

Password: odyssey

ASE-USA Thanks our Newest Life Members

Tom Henricks

Byron Lichtenberg

Rusty Schweickart

Bob Springer

Congress

cont'd from pg. 4

The final technical session of the Congress took place Friday morning, once again at the City of Arts and Sciences. The Future Projects sessions was chaired by US astronaut Franklin Chang-Diaz and included presentations by Chang-Diaz, Louis Freidman of the Planetary Society and a round-table discussion by representatives of the Spanish scientific community. Chang-Diaz opened the session with a discussion of the basic principles of the Variable Specific Impulse Magnetoplasma Rocket (VASIMR) operations and reported on the latest theoretical and experimental results of his efforts to develop the advanced propulsion capability. He also described the conceptual application of the VASIMR to a fast human Mars missions, as well as plans for near-term flight demonstrations. Louis Freidman, Executive Director of the Planetary Society followed with a presentation on the future astronaut as explorer and tele-operator, arguing that the robotic and human exploration programs should be integrated so that the human goal becomes part of the robotic mission, and the robotic mission developments become part of the planning for human exploration. □ □ Freidman

see Congress, pg. 9

Report

cont'd from pg. 2

nated my first EVA four years ago. Since we will be doing a lot of EVAs on the station, this type of work will need to be routine for us to be successful on our long mission. Jeff Williams, a fellow Army officer, was my EVA partner and we got everything done as scheduled plus a couple of extra things that were added while we were outside.

This is a view of what to expect in the future as we will have a lot of unexpected work to do and we must be flexible and prepared to do anything that comes up. The view from outside was breathtaking as it always is, the Earth visible on such a huge scale that it is surreal.

My hands got cold at one point in the EVA. While I was holding the Strela, the Russian crane that we assembled and moved, I could turn on my glove heaters but could not turn up the suit temperature because I needed both hands to lower the mini-work station to access the temperature controller. The glove heaters couldn't keep up with the heat loss from holding such large mass of cold metal.

When I finally installed the crane in its new position I was happy to turn up the suit temperature and warm up. The

exertion of the EVA was good for me - I was pleasantly tired, my normal space backache was gone and I slept better than any other night of the flight. I look forward to doing it again next year when we return.

The next day was a significant one - we opened the hatches and ingressed the International Space Station. It was my first look at our future home, and I must say I wasn't too impressed at first. It was exciting to be there as we opened the hatches, but we were greeted with a funny smell - a pungent odor like that which comes from new plastic and which is in an enclosed place; and it was hot - the temperature in the Node was 34 degrees C. Luckily, after we installed new air ducting and got the air moving the smell went away and the temperature was lowered to a very comfortable level.

Over the next few days we did a lot of work in the Station, including the replacement of batteries, electronic boxes, fans, smoke detectors, recording devices, and other equipment. We also transferred several tons of equipment for later use on the station. This ranged from clothing for the Expedition 1 crew to spare parts to water - hundreds of the different items

see Report, pg. 8

Dear ASE Members,

ASE and I have been on parallel courses since the early days of the organization and the creation, in 1985, of *Conscious Evolution: The World At One*, my highly acclaimed, 12-piece, visionary space-art series conveying the beauty and fragility of the Earth from space and our power to achieve, individually and collectively, a harmonious relationship with each other and the Earth.

It was ASE members who first opened my eyes to the power and meaning of the view of the Earth from space and inspired me to create these art works. ASE was in turn an important supporter of this series during its international lecture tours in the 1980's and displayed, at the invitation of Rusty Schweickart, the entire series at its 3rd Planetary Congress in Mexico City in 1987. Because of this, I want to share the extraordinary developments regarding this series and offer ASE members and their associates an opportunity to participate in the final stages of this very exciting project.

Recognized today as an important contribution to space history, *Conscious Evolution: The World At One* will be housed in the permanent fine art collection of the Smithsonian Institute's National Air and Space Museum. As the creator of this series, I am personally donating 50% of the art work to NASM to enable the Museum to receive the entire series as a philanthropic gift. Many individuals and companies have helped make this dream a reality including actor Tom Hanks, Edgar Mitchell (Apollo 14), former NASM art director Bob Schulman and Xerox Corporation. Only one more piece, "Conscious Evolution", the title piece from the series, remains to be donated to complete the gift.

An impressive, eight-foot banner depicting the Earth from space, "Conscious Evolution" is the recent recipient of the 2000 Thematic Award from Iowa State University of Science and Technology. We are over half way towards finding full sponsorship for this award-winning piece, thereby closing out the project. If you know of anyone who would like to help me complete this project, and would like more information, please contact me at manno.a@worldnet.att.net or 212-243-8190. Individuals and companies may sponsor the remaining half of this piece or smaller shares starting at \$500.

The project website at www.angelfire.com/co/ArtandSoul/ce.html features an image of this award-winning piece and describes the project in more detail. Thanks to those of you who, in the very beginning recognized, inspired and supported my work. I look forward to hearing from you and any suggestions you may have.

Sincerest best wishes,

Angela Manno

Report*cont'd from pg. 6*

needed for humans to live in space.

After the initial odor dissipated, the air quality was excellent on Station as was the temperature (22 C), humidity (56%) and sound level (68 dB). Noise and its effect on hearing loss has been a Space Station Program concern, but it is not a problem in the Node or FGB. We could carry on a conversation across a module in a normal voice and we had no need for hearing protection.

I found the Node to be a particularly pleasant place to be. It is large – about 3-4 meters across depending on where you are and it has some indirect lighting that combined with the bright walls and salmon accent coloring is very pleasing. When I wanted to relax, I would go to the Node to float.

On the other hand, the Node was not a good place to work because it had no velcro and one can't work in space without velcro – there is no place to put procedure books, tools, equipment or anything else you are working with. I added as much velcro to the walls as I could in the time available so it is a bit better than when we arrived but it will require more to make it a good place to work.

This is one area in which the Russian's long duration space flight experience pays off - they know how to design a place to work in space. The module they built, the FGB, was a wonderful work site since the walls, floor and ceiling are carpeted with velcro so one always had a place to put tools. They also have straps on all the panels that allow securing things that have no velcro on them. We liked working there.

This part of the flight was the best for preparing for our long duration flight next year. Technically, we trained by working on the actual equipment we will use – this was the best simulator in the world – the real thing. Mentally it helped me prepare by allowing me to see what the actual environment was like – the size, atmosphere, comfort, sound level and other living conditions. I wasn't sure before the flight if I would be able to live there for 6 months, but after seeing the conditions and living there a week, I now know that I can do it.

Another benefit of going to Station was the motivation it provided my ISS crew. I have been training over 4 years and they for over three, so it provided us with a break from a grueling training and travel schedule and showed us that our management had a lot of confidence in our ability to get the job done with minimum

preparation.

One other thing I gained from working on Station was confirmation of something I already knew – the Expedition 2 crew will be able to live and work together in space for six months with no major problems. Yuri, Susan and I worked well together and will be very compatible on our long flight; in fact there is a synergistic effect that overcomes any weaknesses we may have individually. Crew compatibility is one area that doesn't get much attention but which will play an important role in the success of long duration space missions.

We worked hard, had some fun and landed with a good feeling of mission accomplishment – we have helped with assembly of the International Space Station and with preparing it for humans to live there. Importantly for the Expedition 2 crew, we learned what our future home will be like, and that we can successfully work there.

Jim Voss is a veteran of four space missions, the most recent flight on STS 101 where he performed two EVAs in support of ISS assembly. He is assigned to the second expedition crew scheduled to live onboard the International Space Station. His six month mission will launch on STS 102 in March, 2001.

Congress
cont'd from page 6

expounded on two visions of Mars exploration, one of the lonely astronaut(s) hiking in bulky pressure suits across an alien world, recording his and her impressions and another of astronauts in shorts and t-shirts in a Mars base with 3D goggles, a computer and a joystick teleoperating vehicles working in harsh and hostile environments. □ Freidman proposed a mission architecture wherein both visions merge to create a picture of the future human explorer on Mars. □ That afternoon Duque and Lopez-Alegria made a presentation on living and working in space to the general public at the City of Arts and Sciences.

That evening the delegates gathered for the Closing Ceremony, the final event of the Congress. Held at the City of Arts and Sciences, the banquet was presided over by the Prince of Asturias; following remarks by Pedro Duque, Eduardo Zaplana, president of the Generalitat Valenciana and Michael Lopez-Alegria, the Prince was awarded the Crystal Helmet for his patronage of and support for the XVI Congress. After the ceremony and dinner, the closing ceremony was punctuated by a magnificent fireworks display, concluding an extremely well organized and interesting Congress.

Who's Where

Frederick (Rick) Hauck has been asked to serve on a panel convened by the Marshall Space Flight Center. This group will provide a non-advocate review of the NASA requirements for the Second Generation Reusable Launch Vehicle program.

Jan Davis has assumed responsibilities as director of the Flight Projects Directorate at the Marshall Space Flight Center, where she previously served as deputy director.

**ASE-USA Welcomes 23
New Members in 2000**

- Andy Allen
- Scott Altman
- Ken Bowersox
- Jay Buckley, Jr.
- Dan Bursch
- Kalpna Chawla
- Cady Coleman
- Jan Davis
- Brian Duffy
- Mike Foale
- Steve Hawley
- Tom Jones
- Janet Kavandi
- Scott Kelly
- Kevin Kregel
- Steve Lindsey
- Greg Linteris
- Mike Lopez-Alegria
- Ed Lu
- Rick Mastracchio
- Jim Reilly
- Jim Voss
- Carl Walz

**Flight Anniversaries
2001**

- 5th
STS 72
Soyuz TM-23
STS 75
STS 76
STS 77
STS 78
Soyuz TM-24
STS 79
STS 80

- 10th
STS 37
STS 39
Soyuz TM-12
STS 40
STS 43
STS 48
Soyuz TM-13
STS 44

- 15th
STS 61-C
Soyuz T-15

- 20th
Soyuz T-4
Soyuz 39
STS 1
Soyuz 40
STS 2

- 25th
Soyuz 21
Soyuz 22
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