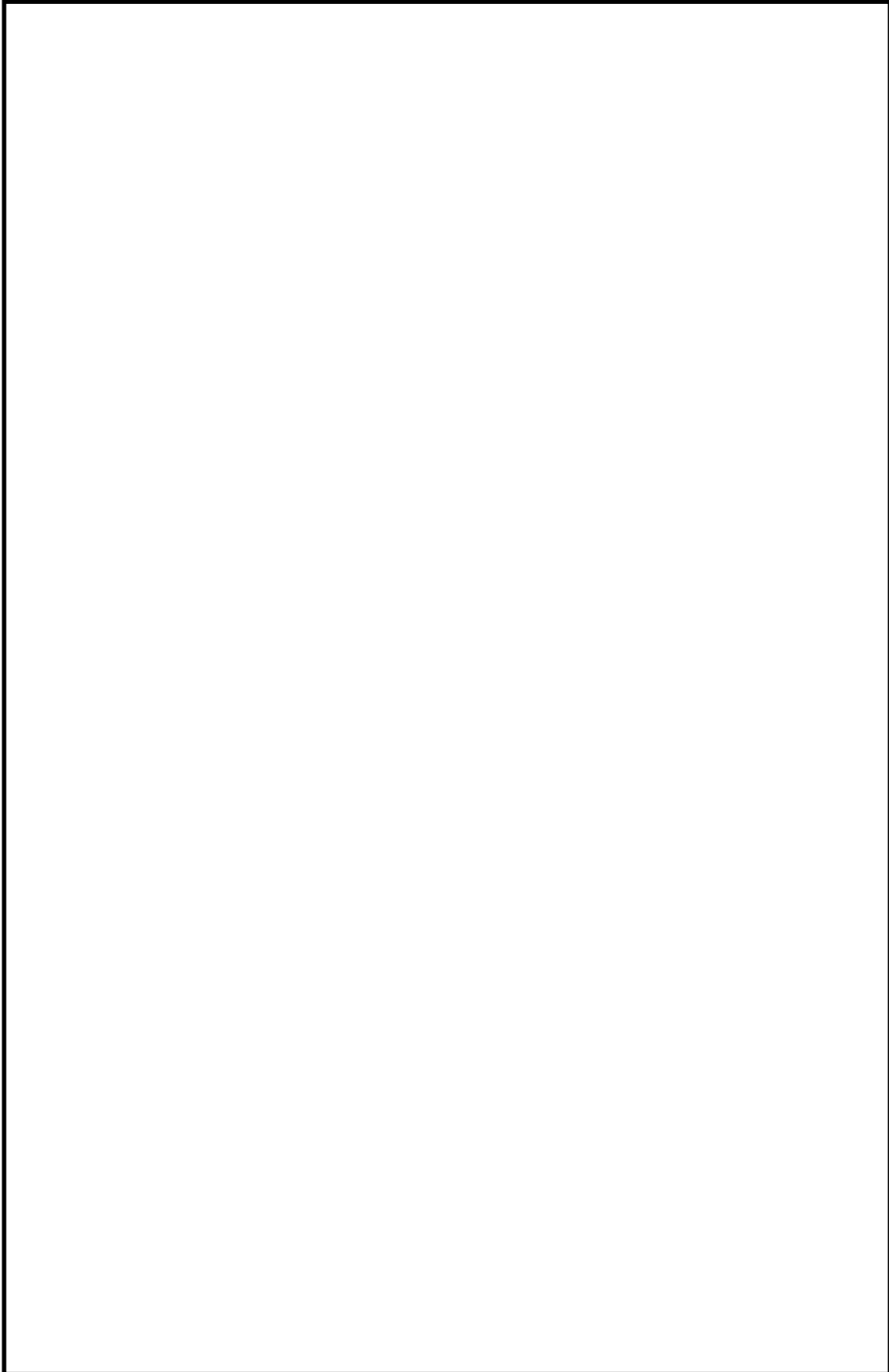


# Association of Space Explorers • USA



**Annual Report  
1997**

*The poster on the cover commemorates the 13th Planetary Congress of the Association of Space Explorers (ASE). The Congress took place September 12-19, 1997 in San José, Costa Rica. Bearing the authentic signatures of fifty-one of the participating astronauts from thirteen nations, it is part of a series of limited collector's edition posters that have been produced and signed at each ASE Congress since the Association was founded in 1985.*

*The poster has two headings, with English at the top and Russian displayed at the bottom. Around the periphery are printed translations of "Association of Space Explorers" in the native languages of all individuals who have flown in space. Clockwise, from upper left with English at the top, they include Romanian, Dutch, Japanese, Czech, Arabic, Polish, Spanish, Hungarian, Kazakh, Vietnamese, Italian, Bulgarian, Afghan, Hindi, Mongolian, German and French. The background is taken from NASA archive photo # 83 HC 213 which has been used for each set of posters in the series.*

*The central image of the poster represents the Congress theme "Space Technology for Sustainable Development." The image features a view of the Shuttle-Mir complex superimposed on a picture of Costa Rica taken from space. The image illustrates the conviction of ASE members that space technology can be used to monitor and support sustainable agricultural practices on Earth. At the 13th Congress, the participating ASE members discussed the contributions human space exploration and space flight technologies make to the development of modern society and to the improvement of the human condition on our home planet.*

*Signed, numbered commemorative posters from past ASE Congresses are available to individuals and organizations who contribute to the Association. Inquiries are welcome at the ASE-USA office in Houston, Texas at (281) 280 8172.*

# **Association of Space Explorers • USA**

**Annual Report  
1997**

**Association of Space Explorers • USA  
1150 Gemini Blvd.  
Houston, TX 77058**

Front row (left to right): Ken Reightler, Jr. (US), Tom Henricks (US), Reinhold Ewald (GER), Joseph Allen (US), Don Peterson (US), Henry Hartsfield, Jr. (US), Franklin Chang-Díaz (US), Alexander Alexandrov (BUL), Bertalan Farkas (HUN), Dirk Frimout (BEL), Byron Lichtenberg (US), Dumitru Prunariu (ROM), Oleg Makarov (RUS), Shannon Lucid (US), Ron Parise (US), Helen Sharman (UK), Sam Durrance (US), Owen Garriott (US), Ulf Merbold (GER), Alexei Leonov (RUS), Frederick Gregory (US), Jon McBride (US), Vladimir Shatalov (RUS), Mirosław Hermaszewski (POL), Anatoli Berezovoi (RUS), Charles Walker (US), Mohammed Faris (SYR).

Second row (left to right): Mario Runco, Jr. (US), Bruce McCandless II (US), Franz Viehböck (AUT), Alexander Ivanchenkov (RUS), Vladimir Soloviev (RUS), Alexander Poleshchuk (RUS), Richard Richards (US), Viktor Gorbalko (RUS), Vladimir Vasyutin (RUS), Vladimir Lyakhov (RUS), Alexander Balandin (RUS), Gennadi Manakov (RUS).

Back row (left to right): Sergei Avdeev (RUS), Gordon Fullerton (US), John-David Bartoe (US), John Fabian (US), Loren Acton (US), Andrian Nikolaev (RUS), Scott Carpenter (US), Viktor Savinykh (RUS).

Not pictured: Gennadi Strekalov (RUS), Kevin Chilton (US).

### Executive Summary

The Association of Space Explorers (ASE) is an independent, nonprofit 501(c)(3) professional and educational organization of over 250 individuals from 26 nations who have flown citizens in space. Founded in 1985, ASE's mission is to provide a forum for professional dialogue among individuals who have flown in space; to promote space science and exploration for the benefit of all; to enhance education at all levels; to foster environmental awareness; and to encourage international cooperation in space.

Each year since 1985, ASE has convened an annual Planetary Congress to serve as a forum where members interact professionally and develop ASE programs. The week-long event generates communication on issues of common interest to the international space community, government agencies and the public. Members exchange information about their national space programs, make technical presentations on selected topics relevant to human space flight operations, discuss the Congress theme, and present the ASE Planetary Award to a person who has made an outstanding contribution related to that theme. Past recipients of the award include Jacques Yves Cousteau, Oleg Gazenko and Gerard O'Neill, Thomas Paine, Boris Raushenbakh, Yash Pal, Hendrick van de Hulst, Hans Dietrich Genscher, Isaac Asimov, Hermann Bondi, Yuri Gagarin, Stanislaw Lem and Nicolas Matte.

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 has worked closely with other international professional space organizations to expand and invigorate international dialogue on such issues as space safety, rescue and human performance, often resulting in published technical proceedings and papers. ASE regularly sponsors international discussions among astronauts on space flight operations.

With respect to education, ASE seeks to stimulate and inspire continual and higher learning by all people. To do this, ASE shares its members' knowledge and experience with the general public, and in particular with the world's youth. ASE members believe that increased public understanding of ecological and technological issues will help us make wise choices for our environment and for the future direction of space exploration. ASE includes among its educational activities annual international member lecture tours, sponsorship of space-related film, drama and video productions, cooperation in the publication of space-related books and calendars and collaboration with the educational programs of other space-advocacy organizations such as the Challenger Center, National Space Society, United States Space Foundation, and Planetary Society.

ASE considers it important to provide its members with opportunities to communicate their unique perspective of Earth to help stimulate humanity's sense of responsibility for the future of our planet. ASE programs seek to expand the important role space plays in monitoring the impact of human activity on the Earth, since the environmental knowledge gained from space is useful for the resolution of many ecological problems. Among ASE's premier activities in the area of environmental education have been the publication of the international best-seller *The Home Planet* in hard and soft cover, participation in the United Nations Earth Day and Mission to Planet Earth ceremonies, lead partnership in the "Arbor Project" international forest conservation effort, and sponsorship of environmental films and videos.

ASE maintains a commitment to fostering international cooperation in space exploration. Since space exploration is a technology-intensive and financially expensive activity, ASE members understand that when many countries jointly invest their resources and ingenuity in common undertakings, all stand to benefit. Chief among ASE's activities in this area are professional exchanges and facilities visits among astronauts of different national space programs, sponsorship of international dialogue on space rescue, and a series of high level invitational discussions in Washington which have resulted in several papers on new opportunities for space cooperation in the changing global political environment.

ASE is committed to continuing its work to improve the quality and effectiveness of the human enterprise in space. Global developments suggest that international cooperation in space science and exploration will continue to expand in the 21st century. The Association of Space Explorers will continue to contribute both leadership and vision as humanity moves outward from our home planet and toward the stars.

## Goals and Objectives

### Professional Forum

To promote the exchange of spaceflight experiences and technical information concerning space operations, science, development, testing and training.

1. Conduct an annual ASE Planetary Congress.
2. Take the lead to promote technical presentations at annual ASE Planetary Congresses.
3. Conduct regular technical interchange meetings for spaceflight crews

### Space Science and Exploration

To promote the exploration of space to enrich human life, bring nations together, advance science and technology, and stimulate intellectual curiosity and the expansion of knowledge.

1. Emphasize space science and exploration in development of annual Congress themes and agenda.
2. Advocate space exploration through public statements, position papers, symposia, and media interviews.

### Education

To share knowledge gained from our experience emphasizing the significance and benefits of space science and exploration. To promote scholastic excellence by supporting educators and motivating students.

1. Establish and distribute ASE Educators Awards.
2. Jointly sponsor activities with other educational organizations.
3. ASE member participation in educational appearances on behalf of ASE.
4. ASE member attendance at annual ASE Congress and participation in associated community activities.

### Environmental Awareness

To promote understanding of our home planet and the limits of its natural resources, and encourage the use of space platforms in characterizing and monitoring Earth's resources.

1. Establish private sector affiliations and partnerships in pursuit of shared environmental goals.
2. Identify and support and/or participate in public and community environmental awareness-related projects.
3. Develop exhibits with environmental focus.
4. Seek national and international environment - focused member appearances opportunities.

### International Cooperation

To encourage international human spaceflight and other cooperative space endeavors, promote technical exchanges, advocate operational compatibility, and contribute to related programs in other professional organizations.

1. Support or sponsor fora on international cooperation, including examination of such issues as compatibility of equipment and procedures.
2. Strengthen ASE affiliation with related international professional organizations.
3. Support active-duty astronaut international visits and exchanges.

*To promote the exchange of space flight experiences and technical information concerning space operations, science, development, testing and training.*

The Annual Planetary Congress is ASE's primary forum for professional exchange among U.S., Russian and international astronauts and cosmonauts. ASE members meet to review and discuss developments in astronautics, to evaluate existing ASE programs and to plan future activities. The Congress affords a unique opportunity for communication between members of the international space community, government agencies and the public.

The 13th Planetary Congress of the Association of Space Explorers (ASE) was held September 12-19, 1997 in San José, Costa Rica. The theme of the Congress was "Space Technology for Sustainable Development," reflecting the Association's belief that space technologies can increase our understanding of the Earth's environment, facilitate the management of natural and non-renewable resources and enhance our ability to communicate across large distances and to rural areas in order to promote the social, cultural and economic development of developing nations. The 13th Congress was hosted by astronaut Dr. Franklin Chang-Díaz.

The Opening Ceremony of the congress was convened on Saturday, September 13 at the National Theatre in downtown San José, where the fliers and their spouses were warmly welcomed by First Vice-President of the Republic of Costa Rica Rodrigo Oreamuno. Oreamuno introduced the fliers to the attending students, dignitaries and officials as "exceptional men and women who have come on a mission of peace...to share their knowledge and impressions of their experiences...of which very few humans have had the privilege to partake". After an informal gathering with the vice-president and attending students, the delegates gathered at the nearby Hotel Camino Real, where they were given an overview of the congress program by the Dr. Chang-Díaz and his local organizing committee.

Saturday afternoon, the first working session, International Space Programs Review, was held at the Hotel Herradura Conference Center and featured presentations by Russian cosmonaut and flight director Vladimir Solovyov, who reviewed the current state of the Mir station; US astronaut Kevin Chilton, who discussed the Shuttle/Mir program and plans for Phases II and III; and Jet Propulsion Laboratory representative Dr. Robert Anderson who gave an overview of the status of the Mars Pathfinder vehicle and its mission.

Sunday, the delegates visited Poas Volcano and ex-

plored the communities of Sarchí and Grecia, where they were introduced to unique Costa Rican folk-craft and industry. In the largest public event of the week, the fliers gathered on Monday, September 15 at the downtown Plaza de la Democracia to celebrate Costa Rican Independence Day. Following remarks by municipal representatives and Costa Rican President José María Figueres, the delegates were treated to a reception hosted by President Figueres at the adjacent Museum of National History. That afternoon, the ASE Committee on Crew Safety and Technology Development, chaired by Fred Gregory, hosted the second working session of the congress.

The session on Crew Safety and Technical Issues began with a discussion by Russian cosmonaut Gennadi Strekalov and US astronaut Shannon Lucid of the applicable lessons learned from their experiences as international crew members on the US Shuttle and Russian Mir space station. Bob Springer followed with a discussion of Boeing's Liquid Fly Back Boosters and the advantages of using these as possible replacements for the current shuttle Solid Rocket Boosters. The last presentation of the day was made by Bruce McCandless II, who discussed the safety and reliability aspects of the Lockheed-Martin VentureStar™ vehicle.

Tuesday, September 16 began with the Theme and Award Ceremony, where the Association presented President Figueres with the annual Planetary Award, the Crystal Helmet, for his efforts in institutionalizing the protection of non-renewable resources and biodiversity in Costa Rica. Also recognized with Leonov Medallions were Costa Rican scientists Rodrigo Gamez and Guy de Terramond for their work in ecological preservation and the use of internet and communications technology in support of sustainable development, respectively. After lunch at the Hotel Marriott, the session on Space Research and Applications provided a glimpse into research plans for the International Space Station as well as possible future modes of space transportation and crew rescue.

Chaired by Charlie Walker, the session began with a report by Dr. Franklin Chang-Díaz on the status of his



*President José María Figueres receives the Crystal Helmet from members of the executive committee (l to r) Frederick Gregory (US), Viktor Savinykh (RUS), Dumitru Prunariu (ROM), President Figueres.*



work on the Variable Specific-Impulse Magnetoplasma Rocket (VASIMR). Dr. Loren Acton followed with a discussion of his investigations into the adhesion of cells in zero-versus one-gravity. In the third presentation, Dr. John-David Bartoe gave a comprehensive over-

*E.A.R.T.H. College (Escuela de Agricultura de la Region Tropicale Humeda)*

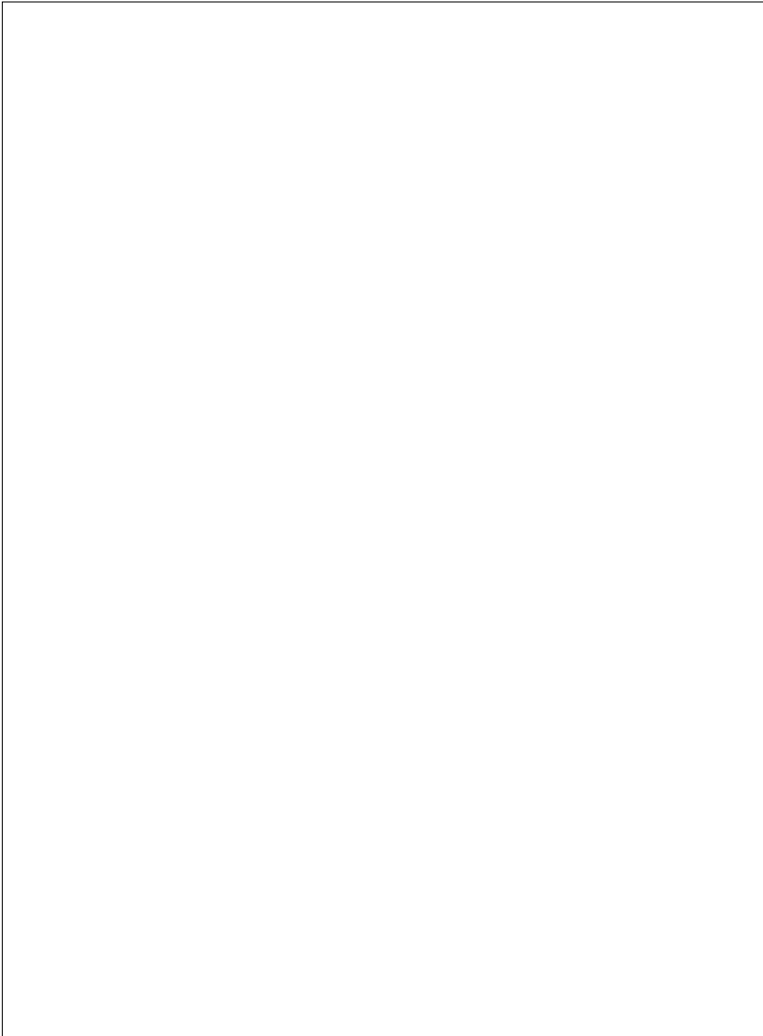
view of future science research plans for ISS. In a last minute addition to the schedule, Gordon Fullerton reported on the status of the X-38 flight development program. After the session, the fliers signed the traditional congress commemorative posters.

The last working session of the Congress was held on Wednesday, September 16 at EARTH College in Guacimo, two hours by bus from San José. The session on Ecology, chaired by Dr. José Zaglul, Rector of EARTH,

included a presentation by Russian cosmonaut Dr. Victor Savinykh, who spoke on the efficacy of earth observation platforms in characterizing environmental change. The ASE Ecology Committee followed with several presentations describing environmental change through photographs taken from space, and EARTH College professor Dr. Bert Kohlmann reported on the collaborative effort between EARTH College and NASA to find a cure for the Chagas Disease. Following lunch at the campus with students and staff, Dr. Harley Thronson from NASA Headquarters' Office of Space Science gave a very well-attended presentation on the Origins Program, NASA's effort to answer the question: Are We Alone?

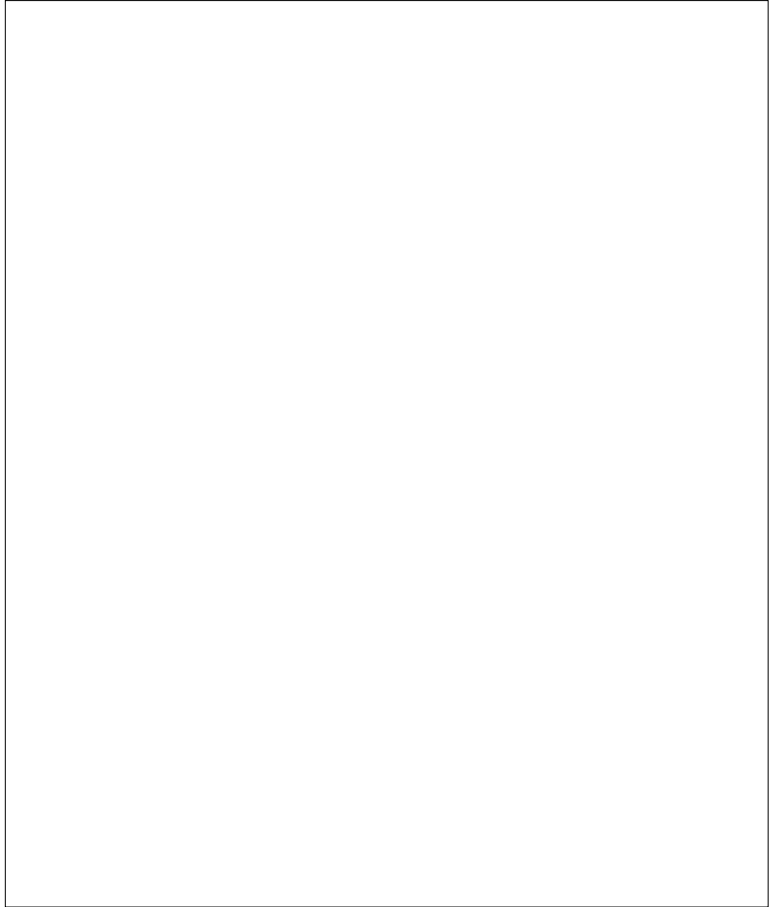
Thursday morning the delegates traveled far and wide within Costa Rica to

*ASE members and E.A.R.T.H. College staff gather around a plaque commemorating their visit following the tree-planting ceremony at E.A.R.T.H. (right to left): Jon McBride (US), Miroslaw Hermaszewski (POL), John Fabian (US), Ron Parise (US), Bertalan Farkas (HUN), Charlie Walker (US), unidentified E.A.R.T.H. College staff.*

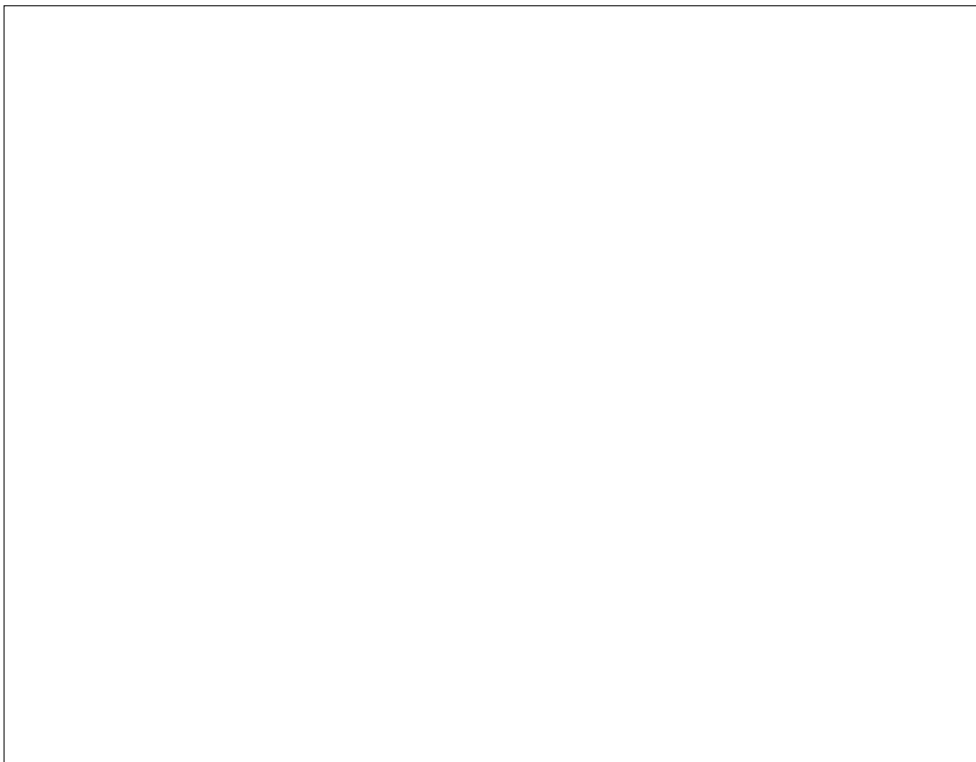


participate in Community Day activities, where the astronauts and cosmonauts were driven or flown to very receptive audiences with parents, students and teachers in local and remote villages and towns.

Thursday afternoon, the executive session was held and the delegates formulated the congress General Statement, approved charter amendments designed to provide a mechanism for the acceptance of new member countries into the association, heard a report from Dirk Frimout on the 14th Congress in Belgium, and approved ASE participation in the Bibo TV and Jaydie Putterman projects. Elections to the international executive committee were held and Fred Gregory and Victor Savinykh were re-elected for a second term to the international governing body.



*Alexei Leonov (RUS) (above right), Owen Garriott (US) and Gordon Fullerton (US) (below), sign autographs for students following the Opening Ceremony at the National Theater in San José.*



*To promote the exploration of space to enrich human life, bring nations together, advance science and technology, and stimulate intellectual curiosity and the expansion of knowledge.*

In an era of tightening budgets and shrinking resources, the implementation of complex and costly space ventures will depend on cooperation and the coordination of the talents of many nations. ASE's role as a forum for the exchange of questions and ideas across borders has contributed to the genuine internationalization of space exploration.

In 1997, the ASE Committee on Crew Safety and Technology Development was formed and tasked to identify critical crew safety issues as well as promising technological advances that enhance crew safety. The committee agreed to take a risk management approach to identifying potential or existing crew risk issues, analyzing their impact and severity and the time frame for resolution, recommending mitigation plans and tracking implementation of proposed solutions.

*To share knowledge gained from our experience emphasizing the significance and benefits of space science and exploration. To promote scholastic excellence by supporting educators and motivating students.*

ASE members regularly appear before educational and professional organizations worldwide. At every opportunity ASE members strive to improve public understanding of our endeavors in space and to inspire young people to continue the challenge begun nearly forty years ago with the launch of Yuri Gagarin, Earth's first human emissary to outer space.

In 1997, the Association became an affiliate member of the Mission HOME national space awareness program. Mission HOME, based in Colorado Springs, Colorado, is a national public awareness program of the Space Awareness Alliance (SAA), a consortium of aerospace companies and other space-advocacy organizations formed to promote the direct public benefits derived from space research, development and exploration.

## International Cooperation

*To encourage international human space flight and other cooperative space endeavors, promote technical exchanges, advocate operational compatibility, and contribute to related programs in other professional organizations.*

ASE is the world's only organization to host regular symposia among US, Russian and international astronauts and cosmonauts on space flight operations. ASE and its members support and participate in meetings of space professionals and policy makers at the national and international levels. Building informed professional relationships and facilitating astronaut and cosmonaut interaction and exchanges are the bases of ASE's efforts to advance international cooperative efforts in the human exploration of space. Since 1994 ASE has maintained a permanent exhibit at the Vienna International Centre in Austria as well as NGO observer status at the United Nations Committees on Peaceful Uses of Outer Space (COPUOS) and Sustainable Development (CSD). In 1997, ASE members made public appearances in the United States, Russia, Poland, Costa Rica, Germany and Austria to promote the tangible benefits of international cooperation in space research and exploration.

## Environmental Awareness

*To promote understanding of our home planet and the limits of its natural resources, and encourage the use of space platforms in characterizing and monitoring Earth's resources.*

The view from space imbues ASE members with a unique perspective of the Earth and a heightened sense of responsibility for the well-being of our home planet. ASE has been at the forefront among organizations advocating the use of space-based observation platforms to monitor humanity's impact on the global environment and the timely world-wide dissemination of data gathered by these space resources.

In 1997, the ASE International Committee on Ecology began development of a series of photographic exhibits for the Association's World Wide Web site, based on presentations made at the 13th Congress, which endeavor to illustrate environmental degradation resulting from natural phenomena as well as industrial and agricultural development.

Shown below are the Executive Committee, Boards of Directors, Standing Committees and staff of ASE at the end of 1997.

**ASE Executive Committee**

Frederick Gregory  
 Mirosław Hermaszewski  
 Alexei Leonov  
 Jon McBride  
 Ulf Merbold  
 Dorin Prunariu  
 Gennadi Strekalov  
 Viktor Savinykh  
 Charles Walker

**ASE-USA  
 Board of Directors**

Jon McBride, President  
 Steve Nagel,  
 Vice-President  
 Joseph Allen, Treasurer  
 Dick Covey  
 Owen Garriott  
 Fred Gregory  
 Rick Hieb  
 Tom Stafford  
 Charles Walker

**ASE-Russia  
 Board of Directors**

Gennadi Strekalov,  
 President  
 Vladimir Vasyutin,  
 Vice-President  
 Alexei Leonov  
 Vladimir Lyakhov  
 Alexander Poleshchuk  
 Victor Gorbatko  
 Oleg Makarov  
 Musa Manarov

**ASE-USA Staff**

Andy Turnage, Executive Director

**ASE-Russia Staff**

Victor Blagov, Director

**ASE International Standing Committees**

**POLICY, LIAISON AND  
 PUBLIC RELATIONS**

Dorin Prunariu, Chair  
 Bob Cenker  
 Ed Gibson  
 Yuri Glazkov  
 Pyotr Klimuk\*  
 Vladimir Kovolyonok  
 Alexei Leonov  
 Byron Lichtenberg  
 Vladimir Remek\*  
 Helen Sharman  
 Valentina Tereshkova

**CREW SAFETY AND  
 TECHNOLOGY DEVELOPMENT**

Fred Gregory, Chair  
 Roy Bridges, Jr.  
 Reinhold Ewald  
 Henry Hartsfield, Jr.  
 Byron Lichtenberg  
 Bruce McCandless II  
 Ulf Merbold  
 Steve Nagel  
 Don Peterson  
 Gennadi Strekalov

\* Subcommittee on History and Archives

**ECOLOGY**

Mario Runco, Jr., Chair  
 Toyohiro Akiyama  
 Alexander Alexandrov (Bul.)  
 Mary Cleave  
 Sam Durrance  
 Bertalan Farkas  
 Dirk Frimout  
 Yuri Glazkov  
 Alexander Ivanchenkov  
 Bruce McCandless II  
 Ernst Messerschmid

**DEVELOPMENT AND  
 FINANCIAL SUPPORT**

Jon McBride, Chair  
 Rick Hieb  
 Bill Nelson  
 Vladimir Vasyutin  
 Don Williams

Vladimir Remek  
 Viktor Savinykh  
 Vitaly Sevastyanov

**General Statement  
of the  
Association of Space Explorers**

13th Planetary Congress

San José, Costa Rica

Fifty astronauts and cosmonauts from 12 countries convened the Thirteenth Planetary Congress of the Association of Space Explorers (ASE) from September 12-19, 1997 in San José, Costa Rica. The theme of the congress was "Space Technology for Sustainable Development", reflecting ASE's concern that while modern technology can improve the quality of life on Earth it must also provide mechanisms to mitigate its impact on the Earth's eco-systems.

Our home planet, this fragile spacecraft we call Earth, has undergone substantial changes over the course of the last century. The impact of human development on the Earth's environment is increasingly evident as we approach the beginning of the new millennium. The demands of modern civilization are resulting in an increase in the pace of deforestation, littoral erosion and atmospheric and oceanic pollution.

Space technology has come of age for the benefit of humankind. Today, more and more humans of different nations partake in this pioneering activity. The ASE embodies a growing representation of this diverse human family in space. The organization is aware of its unique role as a vehicle to foster world collaboration and assist in the transfer of this knowledge to the peoples of the world. The delegates to the Thirteenth Planetary Congress in Costa Rica addressed a pressing issue that affects the people of the developing world: the concept of "sustainable development". Never before has the gift of space technology been so relevant to the people of Latin America. Its great promise lies in the direct transfer of technical information which is key to the achievement of sustainable development. At the same time, the wealth of biodiversity existing in Costa Rica and other areas of Latin America may hold important answers to questions regarding our own survival. Such wealth must be thoroughly catalogued, understood and protected for all humans.

Costa Rica, as a participant in the United Nations' Earth Summit convened in Rio de Janeiro, Brazil in 1992 is at the forefront in institutionalizing the conservation of the Earth's environment. We astronauts and cosmonauts of the Association of Space Explorers have gathered here in Costa Rica to call attention to the many environmental challenges we face and to discuss ways in which space technology can contribute to the solution of these problems. Space-based Earth observation and remote-sensing technologies can facilitate sustainable development by providing accurate crop, soil and pollution analysis and monitoring as well as timely natural disaster and weather forecasting.

Each of us has observed from Earth orbit the results and effects of these many environmental changes. Space explorers from 27 nations, being aware and concerned about the future development and protection of our home planet, support the concept of sustainable development and indeed consider this the only type of development we can afford to pursue. We astronauts and cosmonauts of the world call on all peoples and governments to consider these issues and regard them with all due consideration and to implement the resolutions of the earth Summit in Rio so that future generations may prosper and participate as guardians and beneficiaries of the Earth's environment.

Adopted and Signed September 18, 1997

*The following individuals had joined the Association of Space Explorers and performed or begun their respective space missions as of December 31, 1997*

* Loren Acton, USA STS 51-F	* John-David Bartoe, USA STS 51-F	Robert Cenker, USA STS 61-C
James Adamson, USA STS 28, STS 43	Patrick Baudry, France STS 51-G	Eugene Cernan, USA Gemini 9, Apollo 10, Apollo 17
Viktor Afanasyev, Russia Soyuz TM-11	Georgi Beregovoi, Russia † Soyuz 3	Jean-Loup Chrétien, France Soyuz T-6, Soyuz TM-7, STS 86
Toyohiro Akiyama, Japan Soyuz TM-11	* Anatoly Berezovoi, Russia Soyuz T-5	Mary Cleave, USA STS 61-B, STS 30
Vladimir Aksyonov, Russia Soyuz 22, Soyuz T-2	John Blaha, USA STS 29, STS 33, STS 43, STS 58 STS 79/MIR 22	Jean-François Clervoy, France STS 66, STS 84
Sultan Al-Saud, Saudi Arabia STS 51-G	* Karol Bobko, USA STS 6, STS 51-D, STS 51-J	Michael Clifford, USA STS 53, STS 59, STS 76
Buzz Aldrin, USA Gemini 12, Apollo 11	Roberta Bondar, Canada STS 42	Michael Coats, USA STS 41-D, STS 29, STS 39
Alexander Alexandrov, Russia Soyuz T-9, Soyuz TM-3	Vance Brand, USA ASTP, STS 5, STS 41-B, STS 35	Ken Cockrell, USA STS 56, STS 69, STS 80
* Alexander Alexandrov, Bulgaria Soyuz TM-5	Daniel Brandenstein, USA STS 8, STS 51-G, STS 32, STS 49	Michael Collins, USA Gemini 10, Apollo 11
* Joseph Allen, USA STS 5, STS 51-A	Roy Bridges Jr., USA STS 51-F	Charles Conrad Jr., USA Gemini 5, Gemini 11, Apollo 12, Skylab 2
Jerome Apt, USA STS 37, STS 47, STS 59, STS 79	Curtis Brown Jr., USA STS 47, STS 66, STS 77, STS 85	Richard Covey, USA STS 51-I, STS 26, STS 38, STS 61
Anatoly Artsebarsky, Russia Soyuz TM-12	Mark Brown, USA STS 28, STS 48	John Creighton, USA STS 51-G, STS 36, STS 48
Yuri Artyukhin, Russia Soyuz 14	Valeri Bykovsky, Russia Vostok 5, Soyuz 22, Soyuz 31	Robert Crippen, USA STS 1, STS 7, STS 41C, STS 41G
Oleg Atkov, Russia Soyuz T-10	Robert Cabana, USA STS 41, STS 53, STS 65	Roger Crouch, USA STS 83, STS 94
Toktar Aubakirov, Kazakhstan Soyuz TM-13	Ken Cameron, USA STS 37, STS 56, STS 74	Walter Cunningham, USA Apollo 7
* Sergei Avdeev, Russia Soyuz TM-15	* Scott Carpenter, USA Mercury 7	Vladimir Dezhurov, Russia TM-21
James Bagian, USA STS 29, STS 40	Gerald Carr, USA Skylab 4	Charles Duke, Jr., USA Apollo 16
Michael Baker, USA STS 43, STS 52, STS 68, STS 81	Manley Carter, USA † STS 33	Bonnie Dunbar, USA STS 61-A, STS 32, STS 50, STS 71
* Alexander Balandin, Russia Soyuz TM-9	John Casper, USA STS 36, STS 54, STS 62, STS 77	* Samuel Durrance, USA STS 35, STS 67
Daniel Barry, USA STS 72		

Lev Dyomin, Russia Soyuz 15	Yuri Glazkov, Russia Soyuz 24	* Alexander Ivanchenkov, Russia Soyuz 29, Soyuz T-6
Vladimir Dzhanibekov, Russia Soyuz 27, Soyuz 39, Soyuz T-6, Soyuz T-12, Soyuz T-13	Linda Godwin, USA STS 37, STS 59, STS 76	Georgi Ivanov, Bulgaria Soyuz 33
Donn Eisele, USA † Apollo 7	Viktor Gorbatko, Russia Soyuz 7, Soyuz 24, Soyuz 37	Sigmund Jähn, Germany Soyuz 31
Ronald Evans, USA † Apollo 17	Georgi Grechko, Russia Soyuz 17, Soyuz 26, Soyuz T-14	Tamara Jernigan, USA STS 40, STS 52, STS 67, STS 80
* John Fabian, USA STS 7, STS 51-G	* Frederick Gregory, USA STS 51-B, STS 33, STS 44	Brent Jett, USA STS 72, STS 81
* Mohammed Faris, Syria Soyuz TM-3	William Gregory, USA STS 67	Thomas Jones, USA STS 59, STS 68, STS 80
* Bertalan Farkas, Hungary Soyuz 36	Alexei Gubarov, Russia Soyuz 17, Soyuz 28	Alexander Kaleri, Russia Soyuz TM-14, TM-26, MIR 23
Konstantin Feoktistov, Russia Voskhod 1	Jugderdemidyn Gurragchaa, Mongolia Soyuz 39	Yevgeni Khrunov, Russia Soyuz 5
Martin Fettman, USA STS 58	Chris Hadfield, Canada STS 74	Leonid Kizim, Russia Soyuz T-3, Soyuz T-10, Soyuz T-15
Anatoly Filipchenko, Russia Soyuz 7, Soyuz 16	Jean-Pierre Haigneré, France Soyuz TM-17	Pyotr Klimuk, Russia Soyuz 13, Soyuz 18, Soyuz 30
Klaus Dietrich Flade, Germany Soyuz TM-14	Terry Hart, USA STS 41-C	Vladimir Kovalyonok, Russia Soyuz 25, Soyuz 29, Soyuz T-4
* Dirk Frimout, Belgium STS 45	* Henry Hartsfield Jr., USA STS 4, STS 41-D, STS 61-A	Sergei Krikalyov, Russia Soyuz TM-7, Soyuz TM-12, STS 60
* Gordon Fullerton, USA STS 3, STS 51-F	Frederick Hauck, USA STS 7, STS 51-A, STS 26	Valeri Kubasov, Russia Soyuz 6, ASTP, Soyuz 36
Reinhard Furrer, Germany † STS 61-A	* Terence Henricks, USA STS 44, STS 55, STS 70, STS 78	Alexander Laveikin, Russia Soyuz TM-2
F. Andrew Gaffney, USA STS 40	Susan Helms, USA STS 54, STS 64, STS 78	Valentin Lebedev, Russia Soyuz 13, Soyuz T-5
Jake Garn, USA STS 51-D	Karl Henize, USA † STS 51-F	* Alexei Leonov, Russia Voskhod 2, ASTP
Marc Garneau, Canada STS 41-G, STS 77	* Miroslaw Hermaszewski, Poland Soyuz 30	Fred Leslie, USA STS 73
* Owen Garriott, USA Skylab 3, STS 9	Richard Hieb, USA STS 39, STS 49, STS 65	* Byron Lichtenberg, USA STS 9, STS 45
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Musa Manarov, Russia Soyuz TM-4, Soyuz TM-11	* Andrian Nikolayev, Russia Vostok 3, Soyuz 9	* Richard Richards, USA STS 28, STS 41, STS 50, STS 64
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† Deceased

\* Attended 13th Congress

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