



30th International Symposium on Space Technology  
and Science

Event Report

Date: 2015/07/04 (Sat)–07/10 (Fri)

Venue : Kobe Convention Center, Kobe, Hyogo Prefecture

30th International Symposium on Space Technology  
and Science Organizing Committee

The Japanese Society for Aeronautical and Space Sciences

## Foreword

The “30th International Symposium on Space Technology and Science (ISTS)” was held at Kobe Convention Center, Kobe, Hyogo Prefecture from the 4th to 10th July, 2015 and it was finished with great success.

Under the main theme “Space Voyage - Frontier for a Better Life on Earth,” there were vigorous presentations/discussions among the participants in 19 general technical sessions, a student session, and other special programs. Mr. Kiyoshi Higuchi, IAF President (former JAXA Vice-President) delivered the keynote speech on the opening day, followed by the following special programs:

### Plenary Special Programs

- World Space Highlight 1 : National Space Activities
- World Space Highlight 2 : Easy Access to Space
- World Space Highlight 3 : What can Electric Propulsion do?

Six organized sessions and three panel discussions were also held during the symposium.

The symposium in Kobe was held in conjunction with two other international conferences; the 34th International Electric Propulsion Conference: IEPC, and the 6th Nano-Satellite Symposium: NSAT, through the expansion of some of the ISTS sessions. A total of 1,091 presentations (672 domestic, 419 foreign) were given to an overall audience of 1,505 (972 domestic, 533 foreign, 39 participating countries) registered participants. This was a new record for the number of speeches, registered participants, and foreign registered participants. Including the co-hosting effect, the achievements reflected the global advancement ISTS has made over more than 50 years since its establishment.

This convention also coincided with the 20th anniversary of the Kobe earthquake. We hoped the participants could feel our accomplishments as symbols of a “new voyage” in light of this historical background for our rapid space development transformation. We also actively promoted overseas participation, especially, from Asian countries, and organized/managed this event with the aim of becoming the top international space symposium in Asia. Technical tours and “delivery classes” enhanced the traditional programs and displayed the vibrant characteristics of the host city. More than 13,000 people visited our exhibition site, which we hoped to be good opportunities for them to become more familiar with space.

Apart from achieving the highest participation in the convention history, our greatest reward came from the kind praise we received from many participants. Such success could not have been achieved without the warm support and cooperation of Hyogo prefecture and the Kobe local government officials, the active involvement of the business community, the creativity of the academic institutional network surrounding Kobe University, and the dedication of the organizing committee. I would like to extend my deepest gratitude to all of you.

Thus begins the event report for the “30th International Symposium on Space Technology and Science” (30th ISTS).



Kozo Fujii  
General Chairperson, 30th ISTS Organizing Committee

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# 1. Symposium Summary

## 1.1. Name of the Symposium

English Name : 30<sup>th</sup> International Symposium on Space Technology and Science

English Abbreviation: 30<sup>th</sup> ISTS – Hyogo-Kobe, 2015

## 1-2. Name of Host & Co-Hosts

Main Host : 30th International Symposium on Space Technology and Science  
Organizing Committee

: The Japanese Society for Aeronautical and Space Sciences

Co-Hosts : Electric Rocket Propulsion Society (ERPS)

: Nano-Satellite Symposium Organizing Committee

Collaborator : Hyogo Prefecture, Kobe City, 30th ISTS Hyogo-Kobe Executive  
Committee

Supporters : Ministry of Education, Culture, Sports, Science and Technology; Office of  
National Space Policy; Ministry of Economy, Trade and Industry; Ministry  
of Land, Infrastructure, Transport and Tourism; Ministry of Internal Affairs  
and Communications; Japanese Aerospace Exploration Agency; National  
Institute of Information and Communications Technology; Japanese  
Business Federation (Keidanren)/Committee on the Promotion of Space  
Activities; Japanese National Tourism Organization

Sponsors : Japanese Rocket Society; The Society of Japanese Aerospace Companies;  
The Institute of Electronics, Information and Communication Engineers;  
The Japanese Society of Mechanical Engineers, The Society of Instrument  
and Control Engineers; The Japanese Microgravity Application Society;  
Japanese Aerospace and Environmental Medicine Society, The  
Eco-Engineering Society, Japanese Society for Biological Sciences in  
Space; The Robotics Society of Japan, Society for Promotion of Space  
Science, the American Institute of Aeronautics and Astronautics; The  
Japanese Planetary Sciences Society; Society of Geomagnetism and Earth,  
Planetary and Space Sciences

International Cooperation Organization : Committee on Space Research (COSPAR)

## 1-3. Date and Venue

Date : 2015/07/04 (Sat) ~ 2015/07/10 (Fri)

Venue : Kobe Convention Center

6-9-1 Minatojima-Nakamachi, Chuo-ku, Kobe 650-0046, Japan

#### 1-4. Event History

The very first convention was held in 1959 with the purpose of nurturing the next generation of talent by encouraging participation from students, young researchers, and engineers in a domestic international conference that provided a public stage for global research and technical discussions in a variety of areas such as space engineering, space science, space medicine, and space law to promote further space activity. This event was held biennially on even numbered years until the 26th Hamamatsu convention in 2008, when it was changed to odd numbered years on its 50th anniversary at the 27th Tsukuba convention in 2009. This was done to avoid an overlap with the COSPAR convention year, the largest society in space science. It also allowed the engineering-based ISTS to expand its scientific fields.

#### 1-4. Past Record

	Date	Number of Presented Papers (Domestic:Overseas)	Number of Participants (Domestic,;Overseas)	Number of Participating Countries	Conference Venue
1	1959/5/25-5/28	61(47 : 14)	150(141 : 9)	4	Gakushi Kaikan, Tokyo
2	1960/5/24-5/28	58(36 : 22)	200(150 : 50)	6	Gakusih Kaikan, Tokyo
3	1961/8/28-9/1	62(32 : 30)	225(180 : 45)	12	Japan Center of Cities, Tokyo
4	1962/8/27-8/31	86(34 : 52)	245(185 : 60)	8	Japan Center of Cities, Tokyo
5	1963/9/2-9/7	110(40 : 70)	290(196 : 94)	12	Japan Center of Cities, Tokyo
6	1965/11/29-12/4	116(62 : 54)	259(192 : 67)	9	Japan Center of Cities, Tokyo
7	1967/5/15-5/20	100(42 : 58)	346(250 : 96)	11	Japan Center of Cities, Tokyo
8	1969/8/25-8/30	140(67 : 73)	467(350 : 117)	16	Japan Center of Cities, Tokyo
9	1971/5/17-5/22	119(74 : 45)	304(225 : 79)	11	Japan Center of Cities, Tokyo
10	1973/9/3-9/8	155(80 : 75)	376(290 : 86)	14	Japan Center of Cities, Tokyo
11	1975/6/30-7/5	151(97 : 54)	351(280 : 71)	13	Japan Center of Cities, Tokyo
12	1977/5/16-5/21	152(99 : 53)	400(330 : 70)	14	Japan Center of Cities, Tokyo
13	1982/6/27-7/2	261(186 : 75)	611(488 : 123)	14	Japan Center of Cities, Tokyo
14	1984/5/27-6/1	239(168 : 71)	541(434 : 107)	18	Japan Center of Cities, Tokyo
15	1986/5/18-5/23	328(220 : 108)	700(548 : 152)	18	Japan Center of Cities, Tokyo
16	1988/5/22-5/27	411(331 : 80)	714(583 : 131)	17	Hokkaido University, Sapporo
17	1990/5/20-5/25	365(278 : 87)	791(643 : 148)	19	Prince Hotel Takanawa, Tokyo
18	1992/5/17-5/23	434(313 : 121)	712(568 : 144)	15	Hotel Shiroyama, Kagoshima
19	1994/5/15-5/24	378(282 : 96)	684(544 : 140)	18	Yokohama Prince Hotel, Yokohama
20	1996/5/19-5/25	410(283 : 127)	693(546 : 147)	22	Nagaragawa Convention Center, Gifu
21	1998/5/24-6/1	401(309 : 92)	793(677 : 116)	15	Sonic City Hall, Omiya
22	2000/5/28-6/4	454(365 : 89)	732(607 : 125)	18	Hotel Metropolitan Morioka, Morioka
23	2002/5/26-6/2	519(418 : 101)	759(631 : 128)	15	Shimane Civic Center, Matsue
24	2004/5/30-6/6	461(386 : 75)	712(614 : 98)	19	World Convention Center Sumit, Miyazaki
25	2006/6/4-6/11	568(445 : 123)	823(659 : 164)	18	Kanazawa Theatre, Kanazawa
26	2008/6/1-6/8	642(544 : 98)	852(723 : 129)	26	Act City Hamamatsu, Hamamatsu
27	2009/7/5-7/12	515(423 : 92)	789(667 : 122)	25	Tsukuba International Congress Center, Tsukuba
28	2011/6/5-6/12	676(595 : 81)	881(790 : 91)	19	Okinawa Convention Center, Ginowan
29	2013/6/2-6/9	762(628 : 134)	1,072(887 : 185)	32	Nagoya Congress Center, Nagoya
30	2015/7/4-7/10	1,091(672 : 419)	1,505(972 : 533)	39	Kobe Convention Center, Kobe

## 2. Event Organization

### 2-1. Organizing Committee Structure

Professor Emeritus Kozo Fujii of the Japanese Aerospace Exploration Agency was recommended for the chair of the 30th ISTS Organizing Committee by his predecessor Dr. Masanori Homma, General Chairperson of the 29th ISTS Organizing Committee, and was officially appointed to the position after gaining approval from the ISTS advisory meeting and The Japanese Society for Aeronautical and Space Sciences Board of Directors.

The decision to hold the 30th ISTS between 4th (Sat) and 10th (Fri) of July, 2015, at Kobe Convention Center was made by General Chairperson Fujii. He then appointed chairpersons and members for each executive committee before the full-scale preparation was launched. (Please refer to p.19 Information 6-3: Organizing Committee Member List)

### 2-2. Committee Activity

The following meetings took place between October, 2013 and September, 2015.

(1) Executive committee meetings (32 times in total)

- Chairpersons meetings (7 times)
- Program Committee meetings (5 times)
- Finance Committee meetings (5 times)
- Conference Venue and Registration Committee meetings (3 times)
- Exhibition Committee meetings (4 times)
- Publications Committee meetings (2 times)
- General Affairs Committee meetings (6 times)

(2) Advisory Meetings (3 times)

(3) A financial Audit (1 time)

### 3. Symposium Content

#### 3-1. Symposium Schedule

2015	Morning	Afternoon	Other
07/04 (Sat)			International Space Exhibition
07/05 (Sun)		Registration starts	International Space Exhibition
07/06 (Mon)	Opening Ceremony Keynote Speech/Special Programs		International Space Exhibition Welcome Reception
07/07 (Tue)	Academic Sessions	Academic Sessions	Social Tour International Space Exhibition
07/08 (Wed)	Academic Sessions	Academic Sessions	International Space Exhibition, Poster Sessions, Technical Tour
07/09 (Thur)	Academic Sessions		Technical Tour Social Tour
07/10 (Fri)	Academic Sessions	Academic Sessions	Technical Tour Awards & Closing Ceremony

#### Program for 6th July (Mon)

##### ➤ Opening Ceremony : 09:00–09:50

##### Opening Address :

Prof. Kozo Fujii (General Chairperson, 30th ISTS  
Organizing Committee)

##### Congratulatory Speech :

Mr. Toshizo Ido (Governor of Hyogo Prefecture)  
Mr. Noriyoshi Okaguchi (Deputy Mayor of Kobe City)  
Dr. Naoki Okamura (President, JAXA)  
Prof. Sho Sasaki (COSPAR Representative)

##### Greeting :

Dr. Roger Myers (President, ERPS)  
Prof. Shinichi Nakasuka (General Chairperson, NSAT Organizing Committee)  
Prof. Takahira Aoki (President, JSASS)

##### Program Introduction :

Prof. Toru Shimada (Secretary, Program Committee)

##### Moderator :

Mr. Kazuo Tachi (Chairperson, General Affairs Committee)

##### ➤ Keynote Speech 10:00~10:30

” Why we are trying to explore Space Frontier -From the study of cosmo-anthropology-”  
Speaker: Mr. Kiyoshi Higuchi (President, IAF)

##### ➤ World Space Highlight I : National Space Activities 10:50~12:30

Speaker from Germany : Niklas Reinke (DLR)





Speaker from France : Pierre-Henri Pisani (Embassy of France in Tokyo)

Speaker from South Korea : Eun-Sup Sim (KARI)

Speaker from the United States : Christopher C. Blackerby (NASA)

Speaker from Japan : Hitoshi Kuninaka (JAXA)

### 3-2. Conference Structure and Presented Papers

The program comprised three special programs, nineteen technical sessions, a student session, six organized sessions, and three panel discussions under the main theme of “Space Voyages—a Frontier for a Better Life on Earth.” This year’s convention was held in conjunction with the International Electric Propulsion Conference (b: combined with the Electric and Advanced Propulsion Session) and the Nano-Satellite Symposium (f: combined with a Small Satellite Session), with 1,091 papers (domestic: 672, foreign: 419, participating country: 36) being published from the 1,383 submitted papers. The number of overseas papers published this year surged to 419 from the 134 recorded at the last convention, and the total number of foreign registered participants was 533, making this event a truly international symposium. The statistical data are provided below. (Please refer to p.16 Information 6-1 Session Overview)

#### ★ Presented Papers

Domestic	Overseas	Total
672	419	1,091

Japan	672	Austria	3
USA	111	Poland	3
Germany	71	Belgium	2
China	33	Burkina Faso	2
France	28	Egypt	2
England	24	Réunion	2
Taiwan	17	South Africa	2
Russia	15	Sweden	2
South Korea	14	Thailand	2
Italy	12	Finland	1
Spain	11	Greece	1
Australia	10	Malaysia	1
India	10	Mexico	1
Netherlands	8	Norway	1
Israel	8	Serbia	1
Turkey	6	Sri Lanka	1
Brazil	5	Switzerland	1
Canada	4		
Singapore	4	Total	1,091

### 3-3. Registered Participants

This record breaking symposium attracted 1,505 registered participants (Domestic 972, foreign 533, number of participating nations, 39). The data are shown below.

#### ★ Registered Participants by Registration Type (Unit: People)

Registration Type	Pre-Preregistered	Registered On Site	Total
Regular	595	268	863
Student	443	69	512
Accompanying partners	24	31	55
Complimentary guests	75	0	75
Total	1,137	368	1,505

#### ★ Registered Participants by Countries (Unit: People)

Country	30th ISTS	29th ISTS	Country	30th ISTS	29th ISTS
USA	155	20	Finland	2	0
Germany	65	17	Belgium	2	0
China	49	14	Qatar	2	0
France	40	10	Mexico	1	0
Taiwan	31	24	Burkina Faso	1	0
South Korea	26	10	Angola	1	0
Russia	24	6	Switzerland	1	1
England	22	7	Serbia	1	0
Netherland	14	3	Norway	1	0
Italy	13	3	Denmark	1	0
Turkey	9	0	Vietnam	1	4
India	9	3	Sri Lanka	1	3
Canada	8	8	Malaysia	1	3
Australia	8	4	Indonesia	0	5
Singapore	7	5	Philippines	0	1
Israel	7	0	Iran	0	1
Spain	6	3	Kazakhstan	0	2
Thailand	5	3	Cambodia	0	1
Brazil	4	17	Saudi Arabia	0	1
Sweden	3	3	Mongolia	0	1
Poland	3	1	Overseas	533	185
Austria	3	0	Domestic	972	887
South Africa	2	0			
Egypt	2	1	Total	1,505	1,072
Iceland	2	0			

### 3-4. International Space Exhibition

An “International Space Exhibition” was held for five days during the symposium between the 4th (Sat) and 8th (Wed) of July as a part of “HYOGO-KOBE Space Expo” run by the 30th ISTS Hyogo-Kobe Executive Committee. It was the first time that a five day exhibition had been held and the event not only attracted ISTS participants on weekdays but also a large number of the general public on the weekend. In fact, the events designed for the general public on the weekend included a painting exhibition, which was one of the main reasons for such high attendance at the “HYOGO-KOBE Space Expo.”

★ Exhibition Venue

Kobe International Exhibition Hall No.2

★ Exhibition Date

4th July (Sat) to 7th July (Tue) 10:00–17:00

8th July (Wed) 10:00–16:00

★ Exhibition Scale and Format

Exhibitors (Twenty-six Groups in total)

- Eighteen Space/aeronautics related groups (including four foreign groups)
- Two university related groups
- Five event related local government groups
- One local government group

Format

- One Table Exhibition group
- Twenty-three Booth Exhibition groups
- Two Panel Exhibition groups

★ Total Number of Visitors 12,988



International Space Exhibition Opening Ceremony



Painting Exhibition Awards Ceremony

The International Space Exhibition



Astronaut Lecture

The International Space Exhibition



Weekend Airbus Helicopter Display

## 4. Results Summary

### 4-1. This symposium

The memorial 30th symposium was held under the main theme of “Space Voyage – Frontier for Better Life on Earth.” Space is of course “a frontier,” and exploring such frontier (“space voyage”) is itself an important objective. But in addition, the theme of the symposium had the message that such space activities should and surely will also contribute to the “Better Life on Earth.” Coincidentally, year of 2015 was the 20th anniversary of the Hanshin-Awaji Big Earthquake in Kobe area, and therefore discussing the possibilities of utilization of space for disaster mitigations was one of the themes of this symposium.

This symposium was held together with the 34th IEPC (International Electric Propulsion Conference) and the 6th NSAT (Nano-Satellite Symposium), which contributed to the record-setting 1019 presentations (including 419 from overseas) and 1505 participants (including 533 from overseas). The ratio of the participants from overseas (35 percent) was also very high, which proved that the internationalization of ISTS has been showing a steady progress.

On the first day of the symposium (June 6th, Monday), after the opening ceremony a keynote speech was delivered by Mr. Higuchi, who is the former senior vice president of JAXA and is currently the president of IAF. After that, the plenary sessions “World Space Highlight 1&2” were held. The highlights of recent activities of the space agencies in the world were introduced in the first part (World Space Highlight 1), which provided the audience with up-to-date information of each country' space activity. . In World Space Highlight 2, the recent worldwide activities on the development of micro/nano/pico satellites and the low-cost launchers for such satellites, especially those developed by universities and venture companies were introduced under the theme of “Easy Access to Space.” The recent expanding space utilization and its new players, and increasing private investment on space activities were highlighted in the presentations, which impressed a lot of participants. On the second day, “World Space Highlight 3” was organized under the theme of “What can Electric Propulsion do?” hosted by IEPC, and it also successfully attracted lot of participants. In addition, 3 panel discussions and 2 organized sessions were held as parallel sessions. Technical sessions were held as parallel sessions, including IEPC sessions (session b), and as a result, maximum 17 sessions were held in parallel, which was the largest program in ISTS history. Besides, the 8th spacecraft control system design contest was held under the theme of controlling “Hopping Rover”. A special public evening event was held, where Emeritus professor of Kobe University, Takuya Matsuda, Ph.D. of Astrophysics, was invited to introduce us “Problem of Technological Singularity in 2045” in his lecture on future of Artificial Intelligence.

This biennial international symposium held in Japan is expected to contribute to providing young researchers, engineers and students with the opportunity to hear presentations by the foreign researchers and also to present their own paper in English. As many as 512 students participated in this symposium. A new style of "student competition" was introduced this time, where the papers from the student applicants were pre-screened considering their quality in each research area, and the best student in each area made a presentation in the “finalist session.” This style provided students with the opportunity to listen to other students' papers with high quality and we believe

that this opportunity motivated and encouraged students more. At the same time, however, the modification of the style of the student session from the previous symposium was not clearly announced and this caused some confusions. The improvement is expected in the next symposium.

All the presented papers will be electronically archived on ISTS Paper Archives (<http://archive.ists.or.jp/>) and be open to public for free. The authors can submit their papers to the special issue of the online journal of JSASS (The Japan Society for Aeronautical and Space Sciences), and the papers which passed the peer review will be published as original journal papers.

#### 4-2. Commendation List

##### Student Session

General Chairperson Award	: Shota Kikuchi (The University of Tokyo)
JSASS President Award	: Kousuke Akatsuka (The University of Tokyo)
Modi Memorial Jaya-Jayant Award	: Robin L. Karlsson (The University of Tokyo)
JAXA President Award	: Yushi Inose (Tokyo Metropolitan University)
SPSS President Award	: Tanapoom Jamphon (Panyarat High School)
Hyogo-Kobe Executive Committee Award	: Shintaro Nakajima (The University of Tokyo)
Japanese Rocket Society Award	: Kazuki Sakaki (The University of Tokyo)

##### The 8th Spacecraft Control System Design Contest

Student Category	: Yuki Aoyagi/Shingo Konishi (The University of Tokyo)
General Category	: Hirohisa Kojima (Tokyo Metropolitan University)

##### Best Poster Award

###### First Prize

"Particle Simulation of Interactions between Plasma and Magnetic Field Surrounding Nanosatellite Magnetic Torquers "  
Rei Kawashima, Takaya Inamori, Toshihiro Matsuguma,  
The University of Tokyo, Japan

###### Second Prize

"Ground Experiment for the Small Unified Propulsion System: I-COUPS Installed on the Small Space Probe: PROCYON"  
Hiroki Kawahara, The University of Tokyo, Japan

###### Third Prize

"Development of an Attitude Control System for UCLSat Based on Magnetic Field

and Solar Inputs"

Andrew James May, Colin Forsyth, Dhiren Kataria,

University College London, UK

#### 4-3. Outreach Activities

The ISTS Organizing Committee fully supported all outreach activities conducted by the local executive committees to promote science and space education to the general public. Besides the events at the symposium, a One-Day Delivery Class on Space as well as astronaut lectures were held. Moreover, lecturers have been presented at various science fairs over the past two years. As a result, there has been an increase in the number of space related events hosted by the local government agencies with the support of ISTS. The following are some of the main activities that took place during the convention.

#### ★ Project Organized by the 30th ISTS Hyogo-Kobe Executive Committee

##### 1) Lecture/Mini Lecture by Astronaut Satoshi Furukawa

Date : 2015/07/04 (Sat) 13:30–15:10

Venue : Main Hall, Kobe International Conference Center

Content : Lecture titled “You Too Can Travel in Space!” by astronaut Furukawa

Lecture titled “The Highlight of Space Development as seen at ISTS” by Shinichi Nakasuka (Professor at the University of Tokyo, Faculty of Engineering/ISTS Program Committee Chairperson)

##### 2) JAXA Tsukuba Space Center & Tanegashima Space Center Tour for Junior Spokesperson

Date : 2014/08/02 (Sat)–1024/08/03 (Sun), 2015/05/15 (Fri)–2015/05/17 (Sun)

Venue : JAXA Tsukuba Space Center, Tanegashima Space Center

Content : Tour of the JAXA Tsukuba Space Center and the Tanegashima Space Center by a junior spokesperson selected from within Hyogo prefecture. The tour report is posted on the homepage.

##### 3) One-Day Delivery Class on Space

Time : April– November 2015

Venue : 49 schools in Hyogo prefecture; 23 primary schools, 15 junior high schools, and 11 high schools/secondary colleges.

Content : Class was conducted by lecturers from various JAXA or space/aeronautics related corporations at the forefront of space development.

##### 4) 8th Disaster Prevention Seminar

Time : 2015/01/22 (Thur) and 2015/01/13 (Fri)

Venue : Kobe International Conference Center

Content : Panel discussion titled “The Role of Population Satellites in Disaster Reduction and Prevention” by Yoshiaki Kawata (Disaster Reduction and Human Renovation Institution), Kenichi Toda (JAXA Satellite-1 Application Mission Division), and Muneo Hori (Computational Disaster Mitigation and Reduction Research, RIKEN)

##### 5) Mini Epsilon Rocket Launch and Rocket Lecture

Time : 2015/06/07 (Sun)

Venue : National Institute of Technology, Akashi College.

Content : Event co-hosted by the National Institute of Technology, Akashi College; with the production/launch of a small gunpowder rocket and a rocket development lecture by Mr. Shinichiro Tokudome from JAXA.



## 5. Financial Report

### 5-1. Balance Summary

The sponsor contribution target was set at 15million yen at the first Financial Committee meeting on the 18th October, 2015, and fund-raising activities were then conducted by committee members. By asking each of our respective sponsor corporations to set aside the necessary funding early, the members of the Financial Committee were able to achieve the target regardless of the rather opaque economic environment. Scientific research grants from the Ministry of Education, Culture, Sports, Science and Technology, as well as an international conference grant from the Kobe Convention and Visitors Association and the Tsutomu Nakauchi Foundation also significantly contributed toward the financing of this event.

As this year's symposium was held in conjunction with two other international conferences, as many as 17 programs were running concurrently. As a result, the Kobe International Conference Center was unable to accommodate all sessions and some events had to be held at the Kobe Portopia Hotel. Operating costs for the symposium, such as venue and equipment rental fees, exceeded the initial budget because of the need to use the Kobe Portopia Hotel. Fortunately, the record-breaking 1,505 registered participants (regular 863, student 512, accompanying 55, and complimentary 75), brought on by an increase in the number of submitted papers, provided the revenue surplus needed to counter-balance any expenditure overrun.

An International Space Exhibition was held at Kobe International Exhibition Hall No.2 Building in co-operation with the Hyogo-Kobe Executive Committee. By holding this event in one location and sharing the same vendors with the Hyogo-Kobe Executive Committee, the overall organization was more efficient in terms of both operations and expenditure.

As the Japanese Society for Aeronautical and Space Sciences settles its accounts in February, the balance statement on the following page represents the actual figures from 1st March, 2014, to 31st August, 2015, and the estimated figures from 1st September, 2015 to 29th February, 2016. Further, as our office relocated from Shinbashi to Nihonbashi-Muromachi in October this year, all future payments for removal costs are also included.

All discrepancies in the balance sheet are to be confirmed from the final accounting period at the end of February, 2016 and will be carried over to the next financial year.

At this year's symposium, approximately 500 registrations, around 1/3 of all registered participants, were students. Even though this symposium is considered a nurturing ground for both Japanese and foreign students, our pre-registration fees are still 5,000 yen cheaper than any other international symposium. If student participation continues to increase, we might need to adjust the student registration fee in line with the overall balance.

We were able to achieve a balanced account at the end of the event by reaching the sponsor contribution target and gaining additional financial support from the scientific research grant from the Ministry of Education, Culture, Sports, Science and Technology, the international conference grant from the Kobe Convention and Visitors Association and the Tsutomu Nakauchi Foundation. We would like to extend our deepest gratitude to all involved.

★ Grant-in Aid from the Ministry of Education, Culture, Sports, Science and Technology

We applied for the scientific research grant “Grant-in Aid for Publication of Scientific Research Results of Grant-in Aid for Scientific Research from the Ministry of Education, Culture, Sports, Science and Technology ” and received 9 million yen in 2014 and 2015. This contributed greatly to the financing of the venue rental, materials cost, and meeting expenditures.

5-2. Balance Statement (1 March 2014 – 29 February 2016)

(JPY)

Recurring Revenue		
Category	Subcategory	Total
Investment Income		( 6,075)
	Interests	6,075
Contribution		( 14,830,000)
	Contribution	14,830,000
Operating revenue		( 60,442,605)
	Conference income	60,442,605
Subsidy		( 15,000,025)
	Fiscal subsidy	9,000,025
	Local government subsidy	6,000,000
Miscellaneous		( 1,670)
	Interests	1,670
Recurring revenue total		90,280,375

Recurring Expense		
Category	Subcategory	Total
Operating expenses		( 88,805,139)
	Salaries	12,131,587
	Temporary employment wages	1,697,000
	Severance packages	363,120
	Legal welfare	2,014,738
	Welfare	60,598
	Meeting expenses	907,212
	Travel	572,563
	Communication and transportation costs	5,502,346
	Office supplies	1,283,042
	Homepages	641,480
	Printing and bookbinding	1,501,099
	Rent for venue, office and meeting room	20,387,077
	Utility	260,239
	Lecture fee	89,096
	Social expenses	4,277,119
	Insurance	120,270
	Service charge	3,225,300
	Award	155,900
	Outsourcing expense	32,678,270
	Miscellaneous	329,322
	Taxes and dues	607,761
Recurring expense total		88,805,139
Profit/Loss		1,475,236

## 6. Information

### 6-1. Session Overview

Main theme : “Space Voyage – Frontier for Better Life on Earth”

- ★ Keynote Speech
- ★ World Space Highlight
  - 1) National Space Activities
  - 2) Easy Access to Space
  - 3) What can Electric Propulsion do?
- ★ Organized Sessions
  - o-1) Future Space Transportation System
  - o-2) Launch Vehicle Acoustics
  - o-3) Next Flagship Launch System
  - o-4) Remote Sensing & Geographical Information System
  - o-5) Socio-cultural Approaches for Space Exploration
  - o-6) Space Port
- ★ Panel Discussions
  - Panel-1) Human Voyage: Exploring Our Body and Outer World
  - Panel-2) Space Technology and Disaster Management  
(Harnessing Space Technology for Disaster Management)
  - Panel-3) Space Innovations and Applications
- ★ Technical Sessions
  - a) Chemical Propulsion and Air-breathing Engines
  - b) Electric and Advanced Propulsion
  - c) Materials and Structures
  - d) Astrodynamics, Navigation Guidance and Control
  - e) Fluid Dynamics and Aero-thermodynamics
  - f) Small Satellite
  - g) Space Transportation
  - h) Microgravity Science and Technology
  - i) Thermal Control
  - j) Satellite Communications, Broadcasting and Navigation
  - k) Science and Technology for Human and Robotic Space Exploration
  - n) Earth Observation
  - p) Space Life Science
  - q) Space Power Systems
  - r) Space Environment and Debris
  - t) Systems Engineering and Information Technology
  - u) Space Education and Outreach for the Benefit of All People
  - v) Space Law, Policy and International Cooperation
  - w) Safety and Mission Assurance
- ★ Student Session

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	Tetsuo HIRAIWA	JAXA
	Takayuki YAMAGUCHI	JAXA
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	Yoon YOUNGBIN	Seoul National University

### b) Session (Electric and Advanced Propulsion) Joint Session with 34<sup>th</sup> IEPC

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	Georg HERDRICH	University of Stuttgart



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Wonho CHOE	KAIST

c) Session (Materials and Structures)

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	Hyochoong BANG	KAIST
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e) Session (Fluid Dynamics and Aero-themodynamics)

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f) Session (Small Satellite) Joint Session with 6<sup>th</sup> NSAT

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World Space Highlight (Plenary)

➤ World Space Highlight 1 : National Space Activities

Coordinator : Yoshinori YOSHIMURA, JAXA

➤ World Space Activities 2 : Easy Access to Space

Coordinator : Toru SHIMADA, JAXA

Shinichi NAKASUKA, The University of Tokyo

➤ World Space Highlight 3 : What can Electric Propulsion do ?

Coordinator : Naoki NAGAO, JAXA

Kimiya KOMURASAKI, The University of Tokyo

Organized Session (Parallel)

➤ o-1) Future Transportation System

Coordinator : Kenji FUJII, JAXA

➤ o-2) Launch Vehicle Acoustics

Coordinators : Seiji TSUTSUMI, JAXA, Kent GEE, Brigham Young University,

Amaya Espinosa (CNES)

➤ o-3) Next Flagship Launch System

Coordinator : Kenji FUJII, JAXA

➤ o-4) Remote Sensing & Geographic Information System

Coordinator : Takeo TADONO, JAXA

➤ o-5) Socio-cultural Approaches for Space Exploration

Coordinator : Hiroki OKADA, Kobe University

➤ o-6) Space Port

Coordinator : Nobuyuki KAYA, Kobe University

Panel Discussion (Parallel)

➤ Panel 1 : Space Technology and Disaster Management (Disaster Mitigation from Space)

Coordinator : Michio Ito, JAXA

➤ Panel 2 : Human Voyage : Exploring Outer Body and Outer World

Coordinator : Naoki SATO, JAXA

➤ Panel 3 : Space Innovations and Applications

Coordinators : Corentin GUILLO, Satellite Applications Catapult,  
Misuzu ONUKI, Space Frontier Foundation

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## 30th International Symposium on Space Technology and Science(ISTS)

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C/O The Japan Society for Aeronautical and Space Sciences(JSASS)  
Kinsan BLDG. 4F, 4-1-21, Nihonbashi-Muromachi, Chuo-ku,  
Tokyo ZIP 103-0022 Japan

Tel : +81-3-6262-5315      FAX : +81-3-6262-5314

E-mail : [inquiry@ists.or.jp](mailto:inquiry@ists.or.jp)

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Date of Issue : 2015/01/20