

# The 35<sup>th</sup> ISTS & 14<sup>th</sup> NSAT

## “More Mobile Together”

: Ride on Our Fantastic Vehicle to New Space Frontiers

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# Message from the 35<sup>th</sup> ISTS General Chairperson



As the general chairperson of organizing committee, and also following the wishes of the former chairman, Prof. Kojiro Suzuki, who passed away in December 2024. I am delighted to welcome you all to the 35th International Symposium on Space Technology and Science (ISTS). Since its inception in 1959 in Tokyo, the symposium has been held approximately every two years in various locations across Japan. This year, we have the privilege of hosting the event in Tokushima, a city of unique local culture and natural environment. ISTS is a prestigious international symposium that covers various aspects of the space field. In recent years, the symposium has attracted around 1000 participants from around the world.

Under the theme “More Mobile Together – Ride on our Fantastic Vehicle to New Space Frontiers”, we encourage all participants to engage in discussions and exchange ideas about the contributions of space technology and science. Collaboration with local governments and communities has been key to the success of past symposiums, and this year is no exception. With the support of the local government of Tokushima Prefecture and Tokushima city, we are pleased to offer various special programs, cultural events, and a reception to make your experience truly memorable. Please take the opportunity to enjoy the local cuisine and sightseeing as well.

During the symposium, let us explore how space technology and science can contribute to a sustainable future, through the breakthrough of new technologies and deepening the international cooperation.

We are looking forward to fruitful discussions in open mind.

A handwritten signature in black ink, appearing to read 'S. Sawai'.

Prof. Shujiro Sawai

General Chairperson of the 35th ISTS

## Message from the 14th NSAT General Chair



Last year, in November 2024, we visited the beautiful city of Stellenbosch, South Africa to organize 13th NSAT together with UNISEC-GLOBAL meeting. It was a great moment to witness many startups for micro/nano-satellite components who are selling more than 50 or 100 of their products to satellite manufacturers all over the world, which impressed us very much that the micro/nano-satellite world is now becoming a real business. Also I visited Egypt for “New Space in Africa” conference in April 2025, where I witnessed that many emerging countries are becoming developers as well as users of micro/nano-satellites aiming for various applications such as

disaster mitigation, agriculture, forest or fishery field monitoring, illegal ship detection, urban planning and also for human resource development, which impressed me that the micro/nano-satellites are now utilized for various social problem solving.

In this way, micro/nano-satellites are now utilized not only for education or technological demonstration but also applied to various practical missions including Earth observation, space science and exploration, communication, entertainment, education etc., by which becoming one of core assets for space business. Satellite constellation can provide higher “time resolution” for Earth observation, and its frequent “build-and-modify” process has accelerated the growth of functionalities and reliability of satellites. Recently, formation flying concept is entering into reality, where several space science missions are really appearing which requires cm to mm accuracy of satellite relative position and attitude control. In this way, these concepts of utilizing many low cost satellites in a coordinated way are making the second boost of small/micro/nano-satellite world.

“Nanosatellite symposium,” which started in 2010, has been featuring the technologies, applications, legal matters, educational aspects and many other themes related to micro/nano-satellites. Though the symposium’s name is “Nanosatellite Symposium,” the scope also includes micro and pico-satellites, in total from around 1kg to 100kg. Japanese “Hodoyoshi Project” lead by myself hosted the first five Nanosatellite Symposiums from 2010 to 2013. From 6th symposium, NSAT joined ISTS, such as 6th NSAT in 30th ISTS in Kobe 2015, 8th NSAT in 31st Matsuyama 2017, 9th NSAT in 32nd Fukui 2019, and 12th NSAT in 33rd Kurume 2023. In foreign countries, Varna, Bulgaria hosted 7th NSAT in 2016, and Istanbul 11th NSAT in 2022, and Stellenbosch 13th NSAT in 2024.

Please witness various new technologies of micro/nano-satellites and their applications coming from all over the world, find new friends and discuss collaboration possibility, and try to solve the common issues together. And don’t forget to enjoy the wonderful culture and food of Tokushima.

Please allow me to take this opportunity to announce that the next annual meeting of UNISEC-GLOBAL which is an international university community for micro/nano-satellites will be held in Tokyo in November 2025. I hope you could kindly plan your participation in this meeting as well.



Please join us in the 14th NSAT, and let us share the current technologies and future visions of these evolving space systems. I am looking forward to seeing you all in Tokushima !

A handwritten signature in black ink, reading "Shinichi Nakasuka". The signature is fluid and cursive, with a long horizontal stroke at the end.

Prof. Shinichi Nakasuka, General Chair,  
14th Nano-satellite Symposium Organizing Committee

## Synopsis

The 35<sup>th</sup> ISTS will be held under the main theme “More Mobile Together: Ride on Our Fantastic Vehicle to New Space Frontiers”. Accordingly, the 35<sup>th</sup> ISTS Organizing Committee and the Japan Society for Aeronautical and Space Sciences (JSASS) warmly invite participation by all individuals interested in space-related activities, from Japan, Asia, and around the world. We are also very glad to hold the 14<sup>th</sup> Nano-Satellite Symposium (NSAT) jointly with ISTS. Please join us in Tokushima for a memorable event! The symposium will be held in-person at the venue in Tokushima (no online presentation) Tokushima Prefecture, located on the eastern side of the island of Shikoku, is connected to mainland Japan by the Akashi-Kaikyo and Naruto Bridges, and can be reached from Osaka in two and a half hours by highway bus. It is home to the world-famous Awa Odori Dance Festival and is bountiful in beautiful natural scenery. More details: <https://discovertokushima.net/en>

## Venue

Asty Tokushima : 1-1 Higashihama Boji, Yamashiro-cho, Tokushima City, Tokushima Prefecture

## Chartered Bus Schedule (Tokushima Station ⇄ Asty Tokushima)

\* Please note that seat availability is limited.

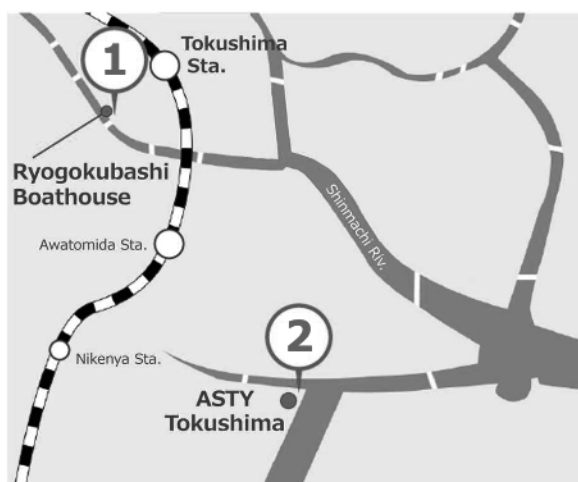
Operates from July 14 (Mon) to July 18 (Fri).

Details will be on the ISTS website and at the Asty Venue.

<https://ists.ne.jp/the35th/venue/>

## Water Taxi service for the 35<sup>th</sup> ISTS !

JR Tokushima station ⇄ ISTS venue (ASTY Tokushima)



### ■ Operation Period

12(Sat) – 18(Fri),  
July 2025

### ■ Fare (tax included)

1,000 yen (One Way)

※ 500 yen for Elementary  
school students and  
younger

### Payment Method

Cash or PayPay

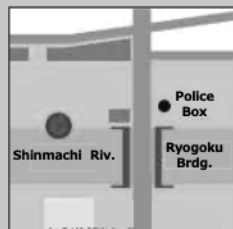


### ■ Timetable / Boarding Points

#### From the station to the ISTS venue

① Ryogokubashi Boathouse ⇒ ② ASTY Tokushima

1 <sup>st</sup> 10:30	9 <sup>th</sup> 14:30
3 <sup>rd</sup> 11:30	11 <sup>th</sup> 15:30
5 <sup>th</sup> 12:30	13 <sup>th</sup> 16:30
7 <sup>th</sup> 13:30	15 <sup>th</sup> 17:30

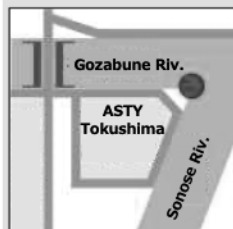


• 8 minutes walk  
from the Station  
• Across from the  
Ryogokubashi  
Police Box

#### From the ISTS venue to the station

② ASTY Tokushima ⇒ ① Ryogokubashi Boathouse

2 <sup>nd</sup> 11:00	10 <sup>th</sup> 15:00
4 <sup>th</sup> 12:00	12 <sup>th</sup> 16:00
6 <sup>th</sup> 13:00	14 <sup>th</sup> 17:00
8 <sup>th</sup> 14:00	16 <sup>th</sup> 18:00



• Near the loading  
entrance at the  
northeast corner of  
ASTY

[Contact] 090-3783-2084 Mr. Nakamura, Shinmachi River Preservation Association

### Contacts and Open Hours

Registration & Information Desk, Asty Tokushima, Ground floor,

Opening Hours: July 12(Sat) - 13(Sun) 10:00 -17:00

July 14 (Mon) - 17 (Thu) 8:30 -18:00

July 18 (Fri) 8:30 - 16:30

### International Space Exhibition

Arena (1F)

July 12 (Sat) - July 16 (Wed) 10:00 - 17:00

## **Organizing Committee**

The committee members' list is available on the ISTS web page.

## **Wi-Fi Service**

Wi-Fi is available free of charge at the venue.

We ask for your cooperation so all participants can use the service comfortably.

## 35<sup>th</sup> ISTS & 14th NSAT Timetable Overview / Event

- Exhibition: Arena /ASTY Tokushima
  - Opening Ceremony / Special Session: Arena/ASTY Tokushima
  - Technical Session: Conference Room (1F, 2F, 3F etc.)/ASTY Tokushima
- ★ Program is subject to change without notice. Please refer to the ISTS Website < <https://ists.ne.jp/> > for the latest information.

Date	Morning	Afternoon	Night	Other Activities
<b>July 12</b> (Sat.)				• Exhibition
<b>July 13</b> (Sun.)				• Exhibition
<b>July 14</b> (Mon.)	<ul style="list-style-type: none"> <li>• Opening Ceremony</li> <li>• Special Session: World Space Highlight</li> </ul>	<ul style="list-style-type: none"> <li>• Special Session: Keynote Speech 1／ Keynote Speech 2／</li> <li>• Prof. Kojiro Suzuki Memorial session</li> </ul>	<ul style="list-style-type: none"> <li>• Welcome Reception (18:30 - 20:30, Hotel JR Clement Tokushima )</li> </ul>	• Exhibition
<b>July 15</b> (Tue.)	<ul style="list-style-type: none"> <li>• Technical Session</li> <li>• OS-1: Soaring to new heights: Towards novel space transportation by industry-government-academia collaboration in Japan</li> </ul>	<ul style="list-style-type: none"> <li>• Technical Session</li> <li>• OS-2: International Collaboration</li> <li>• OS-3: Nutrition and Food Production in Space</li> <li>• Corporate Presentations (12:40-14:00)</li> </ul>	<ul style="list-style-type: none"> <li>• Excursion ①  Cultural Night</li> </ul>	• Exhibition
<b>July 16</b> (Wed.)	<ul style="list-style-type: none"> <li>• Technical Session</li> </ul>	<ul style="list-style-type: none"> <li>• Technical Session</li> <li>• Corporate Presentations (12:40-14:00)</li> </ul>	<ul style="list-style-type: none"> <li>• Excursion ②  New Space Night (Space BD)</li> </ul>	• Exhibition
<b>July 17</b> (Thu.)	<ul style="list-style-type: none"> <li>• Technical Sessions</li> <li>• Finalist Student Session</li> </ul>	<ul style="list-style-type: none"> <li>• Technical Sessions</li> <li>• Finalist Student Session</li> </ul>	<ul style="list-style-type: none"> <li>• Excursion ③</li> </ul>	• Poster Session
<b>July 18</b> (Fri.)	<ul style="list-style-type: none"> <li>• Technical Sessions</li> <li>• 12th Spacecraft Control System Design Contest</li> </ul>	<ul style="list-style-type: none"> <li>• Technical Sessions</li> </ul>	<ul style="list-style-type: none"> <li>• Closing Ceremony</li> </ul>	

***July 14, Monday    35h ISTS Technical Program Overview***

Room	09:00-10:20	Break	10:30-12:00	LunchTime (12:00-14:30)	14:30-16:10	Break	16:30-17:30
Arena 1F	Opening Ceremony		World Space Highlight		Special Program1 Special Program2		Prop. Kojiro Suzuki Memorial Session
Tokiwa Hall 2F							
Meeting Room #6-2F							
Meeting Room #5-2F							
Meeting Room #1-3F							
Meeting Room #2-3F							
S1 Room 1F							
S2 Room 1F							
S3 Room 1F							
S4 Room 1F							

## *July 15, Tuesday    35th ISTS Technical Program Overview*

Room	09:00-10:40	Break	11:00-12:40	Lunch Time (12:40-14:00)	14:00-15:40	Break	16:00-17:40
Arena 1F	OS-1: Soaring to new heights: Towards novel space transportation by industry-government-academia collaboration in Japan		OS-2: International collaboration	Sponsor company presentation	OS-3: Nutrition and Food Production in Space 14:00-17:00		
Tokiwa Hall 2F			【V-1】 Space Policy and History		【V-2】 Space Law		【V-3】 Space Governance and Business
Meeting Room #6-2F	【F-1】 Missions 1		【F-2】 Missions 2		【F-3】 Missions 3		【F-4】 Missions 4
Meeting Room #5-2F	【A-1】 Hybrid Rocket 1		【A-2】 Hybrid Rocket 2		【A-3】 Hybrid Rocket 3		【A-4】 Hybrid Rocket 4
Meeting Room #1-3F	【B-1】 Gridded Ion thruster		【B-2】 Electrothermal thruster		【B-3】 Electrothermal thruster/PPT		【B-4】 Advanced propulsion
Meeting Room #2-3F	【D-1】 Attitude Control (1)		【D-2】 Attitude Control (2)		【D-3】 Attitude Dynamics		【D-6】 Formation Flying & Satellite Constellations (1)
S1 Room 1F	【E-1】 DBD and Space Plane		【E-2】 Rarefied Flow and Fluid Mechanics 1		【E-3】 Rarefied Flow and Fluid Mechanics 2		【E-4】 Fluid Mechanics 3
S2 Room 1F			【G-1】 Space Transportation systems		【G-2】 Propulsion systems		【D-14】 Orbital Dynamics and Control (1)
S3 Room 1F	【H-1】 Material and Combustion Sciences		【H-2】 Gravity-related Technology		【I-1】 Spacecraft Thermal Control I		【I-2】 Spacecraft Thermal Control II
S4 Room 1F	【J-1】 Optical communications		【J-2】 Propagation		【J-3】 Components and Systems		【J-4】 Air and ground systems

## *July 16, Wednesday    35th ISTS Technical Program Overview*

Room	09:00-10:40	Break	11:00-12:40	Lunch Time (12:40-14:00)	14:00-15:40	Break	16:00-17:40
Arena 1F				Sponsor company presentation			
Tokiwa Hall 2F							
Meeting Room #6-2F	【F-5】 Formation Flying		【F-6】 Attitude and Propulsion Hardware 1		【F-7】 Attitude and Propulsion Hardware 2		【F-8】 Simulators
Meeting Room #5-2F	【A-5】 Detonation Engine		【A-6】 Solid Rocket		【A-7】 Combustion 1		【A-8】 Thruster Technology
Meeting Room #1-3F	【B-5】 Airbreathing (1)		【B-6】 Airbreathing (2)		【B-7】 Hall thruster (1)		【B-8】 Hall thruster (2)
Meeting Room #2-3F	【D-7】 Formation Flying & Satellite Constellations (2)		【D-8】 Formation Flying & Satellite Constellations (3)		【D-9】 Formation Flying & Satellite Constellations(4)		【D-10】 Entry/Landing/ Ascent Guidance (1)
S1 Room 1F	【C-1】 Membrane Structures		【C-2】 Space Structures		【C-3】 Materials and Design		【C-4】 Analysis and Design
S2 Room 1F	【E-5】 MHD Flow Control and Reentry 1		【E-6】 Reentry 2		【E-7】 Reentry 3		【D-15】 Orbital Dynamics and Control (2)
S3 Room 1F	【M-1】 Engineering experiment using sounding rocket		【M-2】 Flight test with large scientific balloon		【M-3】 Flight test with small balloons		【G-3】 Aerodynamics
S4 Room 1F	【K-1】 Lunar Exploration and Utilization (1)		【K-2】 Lunar Exploration and Utilization (2), Lunar and Planetary Rover (1)		【K-3】 Lunar and Planetary Rover (2), Space Robotics (1)		【K-4】 Space Robotics (2)

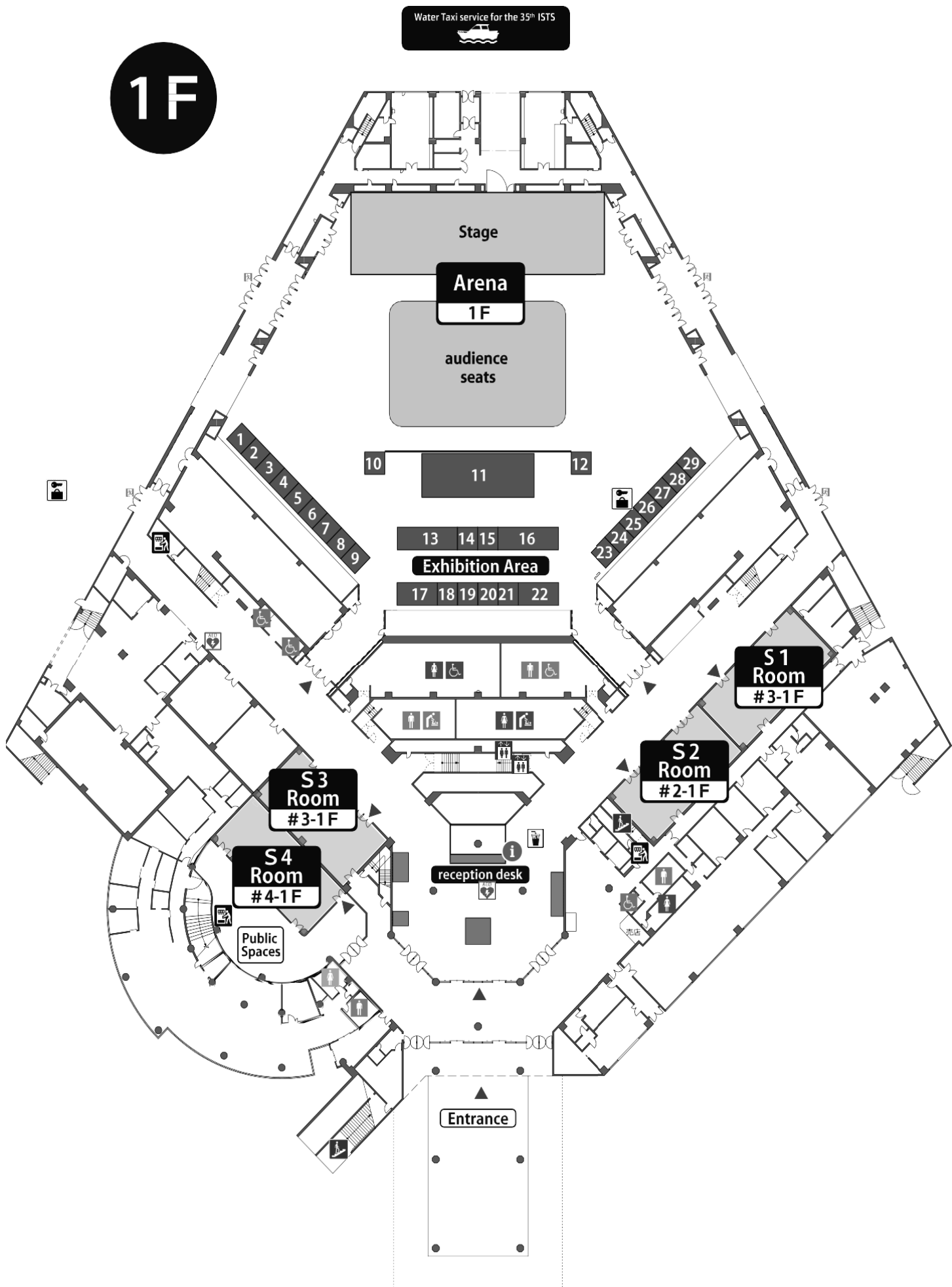


## *July 17, Thursday    35th ISTS Technical Program Overview*

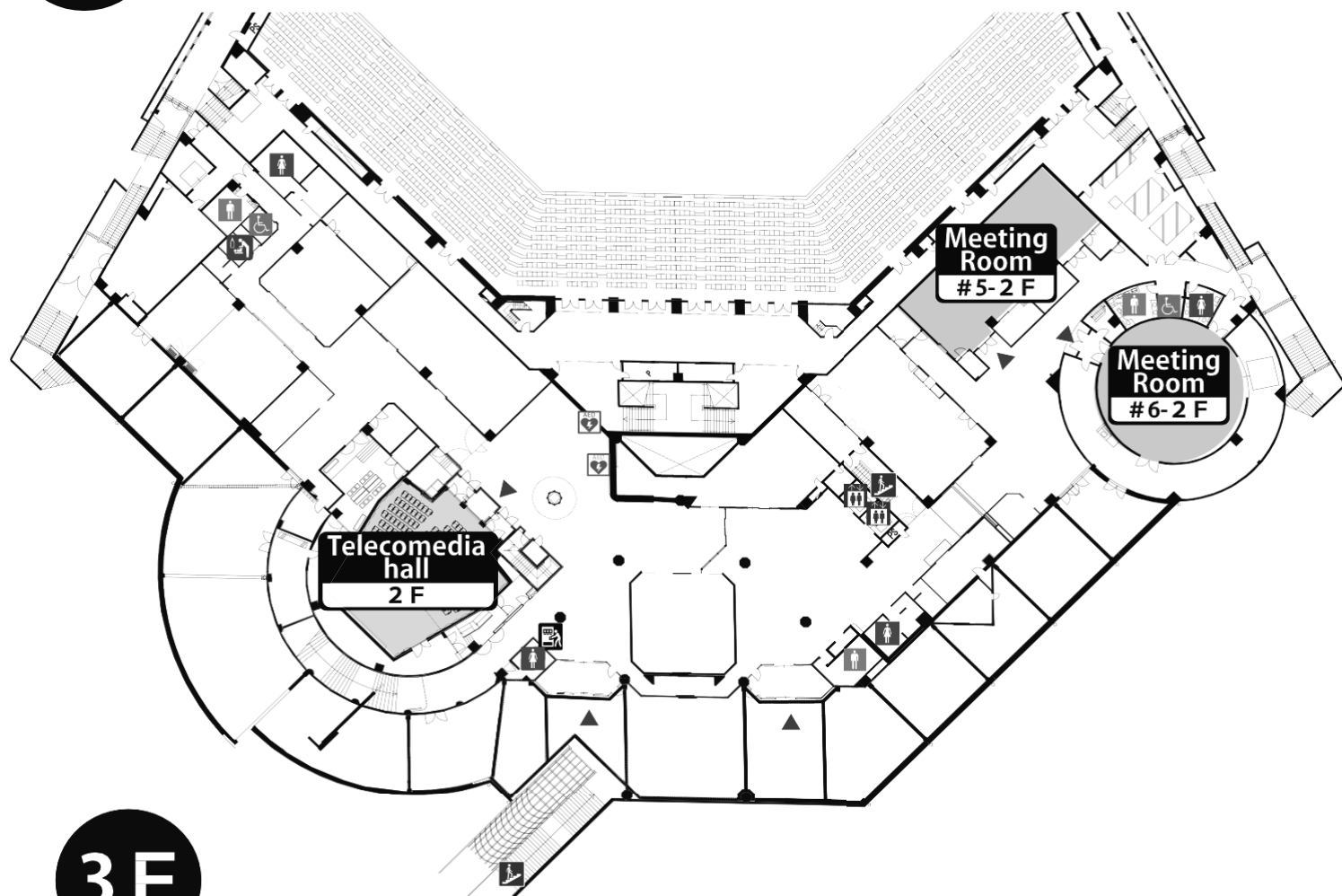
Room	09:00-10:40	Break	11:00-12:40	LunchTime (12:40-14:00)	14:00-15:40	Break	16:00-17:40
Arena 1F							Poster Session 16:30-19:00
Tokiwa Hall 2F	<b>【S-1】</b>		<b>【S-2】</b>		<b>【S-3】</b>		
Meeting Room #6-2F	<b>【F-9】</b> Structure and Thermal Design 1		<b>【F-10】</b> Structure and Thermal Design 2				
Meeting Room #5-2F	<b>【A-9】</b> Supersonic Propulsion 1		<b>【A-10】</b> Supersonic Propulsion 2		<b>【A-11】</b> Combustion 2		<b>【A-12】</b> Liquid Rocket
Meeting Room #1-3F	<b>【B-9】</b> Hall thruster (3)		<b>【B-10】</b> Hall thruster (4)		<b>【B-11】</b> RF/Helicon		<b>【B-12】</b> Electrostatic thruster
Meeting Room #2-3F	<b>【D-11】</b> Entry/Landing/Asc ent Guidance (2)		<b>【D-12】</b> Orbital Rendezvous& Proximity Operations		<b>【D-13】</b> Orbit Determination		<b>【D-16】</b> Trajectory Design and Optimization (1)
S1 Room 1F	<b>【C-5】</b> Vibration		<b>【C-6】</b> Satellite Structures(1)		<b>【C-7】</b> Satellite Structures(2)		<b>【F-11】</b> Operations
S2 Room 1F	<b>【T-1】</b> Enhancing Practical Learning with MBSE in Universities		<b>【T-2】</b> Integrating Model Based Approaches for Space System		<b>【T-3】</b> Transforming Business with Systems Engineering and IT in Manufacturing		
S3 Room 1F	<b>【U-1】</b> Space Education and Outreach for the Benefit of All People (1)		<b>【U-2】</b> Space Education and Outreach for the Benefit of All People (2)		<b>【U-3】</b> Space Education and Outreach for the Benefit of All People (3)		
S4 Room 1F	<b>【K-5】</b> Exploration and Technologies for Mars and its moons		<b>【K-6】</b> Exploration and Technologies for Space and Small bodies		<b>【Q-1】</b> Space Power Systems and Technologies I		<b>【Q-2】</b> Space Power Systems and Technologies II

## July 18, Friday 35th ISTS Technical Program Overview

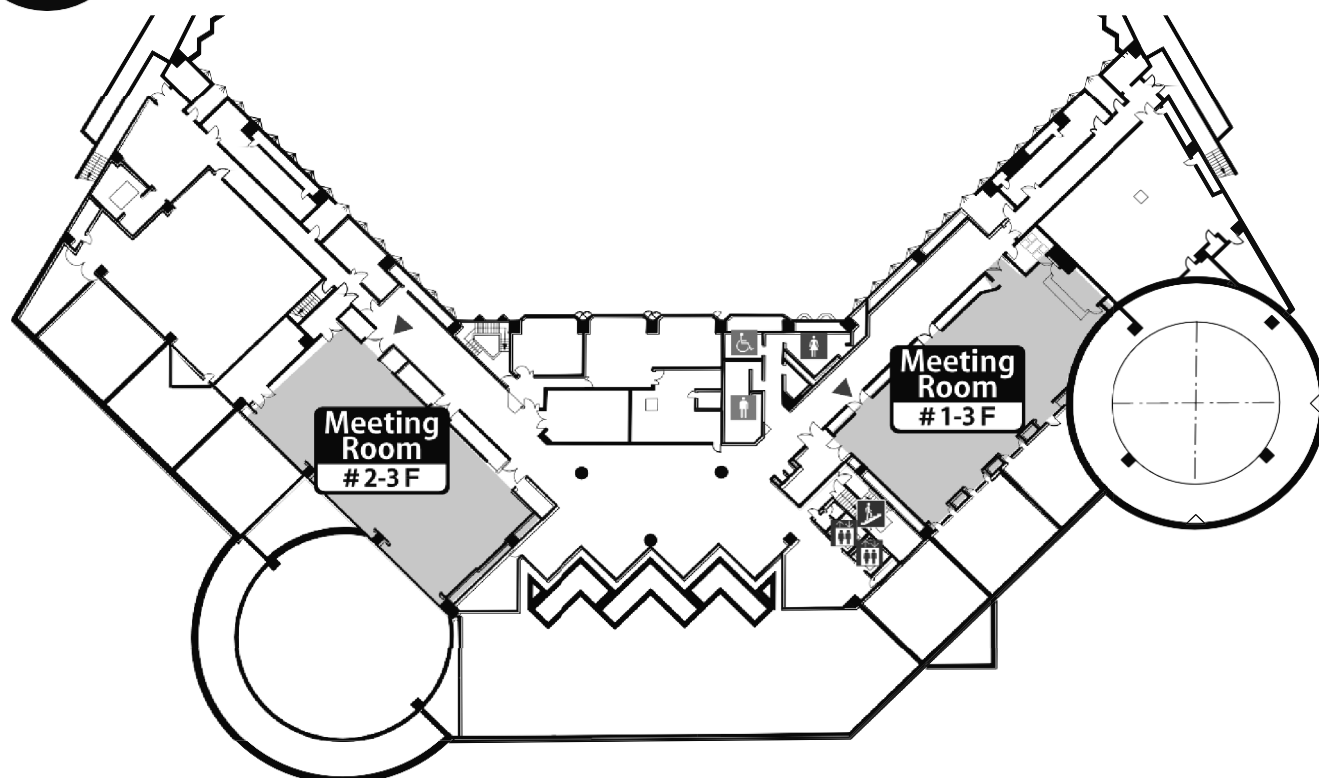
Room	09:00-10:40	Break	11:00-12:40	LunchTime (12:40-14:00)	14:00-15:40	Break	16:00-17:40
Arena 1F							
Tokiwa Hall 2F							
Meeting Room #6-2F	Spacecraft Control System Design Contest				【D-4】 Attitude Determination		【D-5】 Navigation
Meeting Room #5-2F	【A-13】 Next Generation System						
Meeting Room #1-3F	【B-13】 Electromagnetic thruster		【B-14】 Cathode/Facility				
Meeting Room #2-3F					【D-17】 Trajectory Design and Optimization (2)		【D-18】 Trajectory Design and Optimization (3)
S1 Room 1F	【N-1】 SAR Applications		【N-2】 Environmental Monitoring I		【N-3】 Environmental Monitoring II		
S2 Room 1F	【R-1】 Space debris, Risk Management of Space Objects(1)		【R-2】 Space debris, Risk Management of Space Objects(2)		【R-3】 Space debris, Removal and Social Impact		【R-4】 Space environment
S3 Room 1F	【W-1】 EEE components		【W-2】 Mission assurance		【W-3】 Safety		【W-4】 Safety
S4 Room 1F	【Q-3】 Energy Systems for the Moon		【Q-4】 Solar Power Satellite I		【Q-5】 Solar Power Satellite II		【Q-6】 WPT

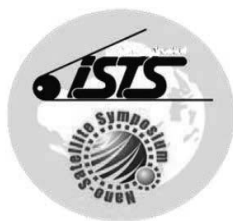


2F



3F





# Joint Symposium: The 35th ISTS & 14th NSAT Opening Ceremony

9:00am~10:20am, July 14, 2025 Monday,

Asty Tokushima, Arena (1F)

- |   |   |
|---|---|
| • Opening   | Prof. Shinji NAKAYA<br>Chairperson of General Affairs Committee                                   |
| • Opening Address from 35th ISTS                                  | Prof. Shujiro SAWAI<br>General Chairperson of the 35th ISTS                                       |
| • Congratulatory address from<br>Governor of Tokushima Prefecture | Mr. Masazumi GOTODA<br>Governor of Tokushima Prefecture   |
| • Congratulatory Address from JAXA                                | Prof. Hiroshi YAMAKAWA<br>President of Japan Aerospace Exploration Agency                         |
| • Congratulatory Address from EU                                  | Jean-Eric Paquet<br>Ambassador of the European Union to Japan                                     |
| • Congratulatory Address from<br>COSPAR                           | Prof. Masaki Fujimoto<br>Representative of Committee on Space Research                            |
| •<br>Congratulatory Address from NASA                             | Dr. Joseph Casas<br>Representative of Overseas Program Committee                                  |
| • Address from NSAT   | Prof. Shinichi Nakasuka<br>General Chairperson of the 14th Nano-Satellite<br>Organizing Committee |
| • Address from JSASS  | Prof. Shujiro SAWAI<br>President of Japan Society for Aeronautical and Space Sciences             |
| • Information of Program and Event Schedule                       | Prof. Satoshi NONAKA<br>Chairperson of Program Committee  |
| • Closing   | Prof. Shinji NAKAYA<br>Chairperson of General Affairs Committee                                   |

## Special Programs (Plenary, Invited Speakers)

### Special Session 1/World Space Highlight

**Date:** July 14 (Mon) 10:30 - 12:00

**Place:** Arena (1F)

**Moderator:** Dr. Masami Onoda, Director, International Relations and Research Department, JAXA

**Panelists:**

- (1) Mr. Andrew Masciola, NASA Asia Representative
- (2) Dr. Niklas Reinke, Director Tokyo Office, DLR
- (3) Mr. Julien Mariez, Regional Counsellor for Space Affairs, CNES
- (4) Prof. Marco Casolino, Space Attaché, Embassy of Italy to Japan

**Based on the ISTS theme of “More Mobile Together,” the speakers will introduce the realization of future space exploration mobility and the Artemis program.**

### Keynote Speech 1 / Evolution of Space Transportation by Academia and Startup Collaborations

**Date:** July 14 (Mon) 14:30 - 15:15

**Place:** Arena (1F)

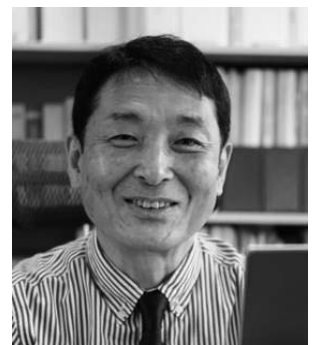
**Moderator:** Prof. Satoshi Nonaka, Chairperson of the Program Committee ISTS, JAXA

**Speaker:** Prof. Yasuhiro Morita

Professor Emeritus of ISAS/JAXA & CEO of Rocket Link Technology

Evolution of Space Transportation by Academia and Startup Collaborations

Japan's rocket venture business will become increasingly important in this coming decade as declared by the government: small launchers and manned space vehicles are defined to be developed by the startup sectors. The government is willing to provide strong financial support to help them develop their unique rockets: SBIR and JAXA fund. In addition, there are more contributions we can make: how can we make the venture business much stronger to compete in the world market? It cannot be forgotten that the past academic achievements have become a strong basis to establish the representative startup companies. To accelerate the venture activities in a better way, we must be more strategic and collaborative among all the stakeholders including JAXA, the space and non-space industries, the academia, the government and more. The talk will provide some tips in this respect.



## Keynote Speech 2 / Looking back on SLIM's moon landing, looking ahead to the future

**Date:** July 14 (Mon) 15:25 - 16:10

**Place:** Arena (1F)

**Moderator:** Prof. Satoshi Nonaka, Chairperson of the Program Committee ISTS, JAXA

**Speaker:** Shin-ishihiro Sakai

Professor, ISAS/JAXA, SLIM Project Manager

Looking back on SLIM's moon landing, looking ahead to the future

The Smart Lander for Investigating the Moon (SLIM), with a dry mass of about 200 kg, was launched by the H-IIA vehicle on September 7, 2023, and made an excision lunar landing on January 20, 2024 (JST). The landing precision was evaluated to be within ~10 m at an altitude of approximately 50m from the Moon surface, far exceeding the target landing accuracy of 100 m and realizing the world's first pinpoint landing. In this keynote, we will review the achievements of SLIM's lunar landing and discuss how those achievements can contribute to future space development.



## Special Session 2 / Memorial session : Under the wing of Prof. Kojiro Suzuki, Toward New Space Frontiers

**Date:** July 14 (Mon) 16:30 - 17:30

**Place:** Arena (1F)

**Moderator:** Maximilien Berthet

**Speakers:** Marcus Lobbia, Systems Engineer Jet Propulsion Laboratory, NASA, United States

“Perspectives as a past graduate student of Prof. Kojiro Suzuki”

Ethirajan Rathakrishnan, Professor Emeritus Indian Institute of Technology, Kanpur, India

“Professor Suzuki and Hypersonic Flow”

Kazuhiko Yamada, Associate Professor JAXA/ISAS, Japan

“Research and develop activity on the inflatable aeroshell atmospheric-entry technology.

~Start from preliminary study, challenge to flight demonstration and future vision~”

Kazuhisa Fujita, Chief Technology Officer Elevation Space, Japan

Professor Kojiro Suzuki was the General Chairperson of the 35th ISTS, and Professor in the Graduate School of Frontier Sciences at The University of Tokyo. He passed away suddenly last December, at the young age of 62.

A special session will be held in his memory at the 35th ISTS, on Monday 14 July, 16:30-17:30. It will be open to the public.

Professor Suzuki’s research career can be described in three words: flow, space, and freedom. As a world-leading fluid dynamicist, Professor Suzuki made significant contributions to the study of hypersonic high-enthalpy flows and gas dynamics. As an aerospace systems engineer, he pioneered new concepts for easier space exploration and transportation. As a colleague, supervisor, and mentor, he devoted himself deeply and gently to nurturing the dreams and creativity of those around him, bridging between countries, backgrounds, and fields.

Join us as we reflect on the life and career of a remarkable scientist, engineer, and human being. Presentations by close colleagues of Professor Suzuki will be accompanied by pre-recorded messages and videos.



Image credits: JAXA/NASA

# The 35<sup>th</sup> ISTS & 14<sup>th</sup> NSAT

Nano-Satellite Symposium  
International Symposium on  
Space Technology and Science

12-18 July 2025, Tokushima City, Japan • Homepage: <https://ists.ne.jp/>



## **Memorial session: Under the wing of Prof. Kojiro Suzuki, toward new space frontiers**

*Professor Suzuki was the General Chairperson of the 35<sup>th</sup> ISTS.  
He passed away suddenly last December, at the young age of 62.*

Professor Kojiro Suzuki's research career can be described in three words: flow, space, and freedom. As a world-leading fluid dynamicist, Professor Suzuki made significant contributions to the study of hypersonic high-enthalpy flows and gas dynamics. As an aerospace systems engineer, he pioneered new concepts for easier space exploration and transportation. As a colleague, supervisor, and mentor, he devoted himself deeply and gently to nurturing the dreams and creativity of those around him, bridging between countries, backgrounds, and fields.

Join us as we reflect on the life and career of a remarkable scientist, engineer, and human being.



**Marcus Lobbia**  
Systems Engineer  
Jet Propulsion Laboratory  
NASA, United States



**Ethirajan Rathakrishnan**  
Professor Emeritus  
Indian Institute of Technology,  
Kanpur, India



**Kazuhiko Yamada**  
Associate Professor  
JAXA/ISAS, Japan



**Kazuhisa Fujita**  
Chief Technology Officer  
Elevation Space, Japan

**Moderators/Organisers:** Maximilien Berthet (The University of Tokyo) & Kazuhiko Yamada (JAXA/ISAS)

## **Organized Session 1 (OS-1) / Towards novel space transportation by industry-government-academia collaboration in Japan**

**Organizer:** Yusuke Maru and Wataru Sarae (JAXA)

**Date and time:** July 15th (Tue) 9:00 - 10:40

**Place:** Arena (1F)

**Purpose:**

- To promote private-sector initiatives that are currently a major driving force in space transportation
- Sharing expectations for industry-government-academia collaboration to accelerate the development of space transportation systems

**Scheduled Speakers:**

Jiro KASAHARA, Professor, Nagoya University

Hiroshi SASAKI, General Producer of Space Strategy Fund, JAXA

Shinichi TAKATA, Space Strategy Fund, JAXA

Tadayoshi SHOYAMA, Chief Scientist, Innovative Space Carrier Inc.

Koji KANEKO, Business Development Dept. Leader, SPACE COTAN

## Organized Session 2 (OS-2) / International Collaboration, Vision 2040: Balancing Global, Regional, and National Partnerships

**Date:** July 15 (Tue) 11:00 - 12:40

**Place:** Arena (1F)

**Organisers/Moderators:**

Maximilien Berthet, Department of Aeronautics and Astronautics, The University of Tokyo, Japan.

Ikuko Kuriyama, Institute for Future Initiatives, The University of Tokyo, Japan.

**Speakers:**

Alex da Silva Curiel, Head of International Business, Surrey Satellite Technology Ltd (SSTL), UK.

*“Lessons learned from over 20 international space mission partnerships”*

Marco Aliberti, Lead on International Engagement, European Space Policy Institute (ESPI), Austria.

*“Non-Governmental Pathways to Space Diplomacy: The Power of Ideas and Think Tanks”*

Chris Blackerby, COO, Astroscale, Japan.

*“Satellite Servicing: Ensuring Security and Expanding Economies in Orbit”*

Hazuki Mori, Lead, Space Technology, World Economic Forum.

*“Overview of the Space Activities of the World Economic Forum”*

Joshua Critchley-Marrows, Chair of Space Generation Advisory Council (SGAC).

*“The role of the next generation in shaping international collaboration”*

Shinichi Nakasuka, Professor, Department of Aeronautics and Astronautics,  
The University of Tokyo, Japan.

*“University community for space activities – UNISEC-GLOBAL Challenge”*

### **A new era of international collaboration: The role of non-governmental actors**

#### **Objectives & Overview**

A new era of international collaboration in space has taken root, in which academia and industry are more prominent than ever before. In parallel, sustainable use of outer space has become the common global challenge facing all space actors. For instance, in 2024 the UN Summit of the Future adopted the Pact for the Future, inviting the contribution of the private sector, civil society, and other stakeholders to international discussion for ensuring sustainability of outer space. Given this new reality, what is the role that non-governmental actors should play in promoting international cooperation towards sustainable space development? In this session, diverse distinguished experts from the private sector, academia, and think-tanks will provide perspectives on promising approaches to cooperate in space for the benefit of all humanity, with particular focus on the Asia-Pacific region.

Image credits: JAXA/NASA

# The 35<sup>th</sup> ISTS & 14<sup>th</sup> NSAT

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Space Technology and Science

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## **Organised session – A new era of international collaboration: The role of non-governmental actors**

*What is the role that non-governmental actors should play in promoting international cooperation towards sustainable space development? In this session, diverse distinguished experts from the private sector, academia, and think-tanks will provide perspectives on promising approaches to cooperate in space for the benefit of all humanity, with particular focus on the Asia-Pacific region.*



**Alex da Silva Curiel**  
Head of International Business  
Surrey Satellite Technology Ltd., UK



**Chris Blackerby**  
COO, Astroscale  
Japan



**Hazuki Mori**  
Lead, Space Technology  
World Economic Forum



**Marco Aliberti**  
Lead on International Engagement  
European Space Policy Institute  
Austria



**Shinichi Nakasuka**  
Professor  
The University of Tokyo  
Japan



**Joshua Critchley-Marrows**  
Chair of Space Generation  
Advisory Council

Moderators/Organisers: Maximilien Berthet & Ikuko Kuriyama, The University of Tokyo, Japan

## **Organized Session 3 (OS-3) / Nutrition and Food Production in Space**

**Date:** July 15 (Tue) 14:00 - 17:40

**Place:** Arena (1F)

**Chairpersons:** Professor Yoshiaki Kitaya (Osaka Metropolitan University)  
Professor Takeshi Nikawa (Tokushima University)

### **Circular Cell Culture System Using Microalgae and Animal Cells for Future Space Food**

Tatsuya Shimizu (Tokyo Women's Medical University, Japan)

### **Frontiers in Disaster Nutrition and Space Nutrition**

Nobuyo Tsuboyama-Kasaoka (National Institutes of Biomedical Innovation, Health and  
Nutrition, Japan)

### **Energy and substrate metabolism during spaceflights and analogs. Inferences for health on Earth**

Stephane Blanc (CNRS, France)

### **Anti-muscle atrophic protein food source in space: Development of a recirculatory rearing system for soybeans and crickets**

Takeshi Nikawa, Katsuyuki Miyawaki, Takahiko Watanabe, Taro Mito, and Akira  
Takahashi (Institute of Space Nutrition & Medicine, Tokushima Univ., Japan)

(A Short Break)

### **Study on plant responses against the stresses of microgravity and high ultraviolet radiation in space**

Chen Xi, Kaoru Yoshiyama (Okamoto), Genji Kamada, Haruo Kasahara, Daisuke Masuda, Toru  
Shimazu, Kana Kuriyama, Kazumi Koga, Tomokazu Yamazaki, Noriko Matsuzaki, Akira Higashibata,  
Jun Hidema (Research Center for Space Agriculture and Horticulture (Chiba University, Japan)

### **Sweet potato culture in space farming in CELSS**

Yoshiaki Kitaya (Osaka Metropolitan University, Japan)

### **Plasma-Synthesized Dinitrogen Pentoxide for Rice Cultivation on Lunar Farms**

Toshiro Kaneko, Daiki Suzuki, Shota Sasaki, Atsushi Higashitani (Graduate School of Engineering,  
(Tohoku University, Japan)

### **Nutrition in Space**

Guillemette Gauquelin-Koch (CNES, France)

Closing Remarks

## 12<sup>th</sup> Spacecraft Control System Design Contest

**Date:** July 18 (Fri) 9:00 - 12:40

**Place:** Meeting Room #6-2F

The contest aims at providing opportunity to capture the nature of dynamics and control of spacecraft through solving a typical spacecraft control problem and to feel joy to develop “my” algorithm. A certain control problem is announced beforehand, and participants design a controller in the form of a program, which will be evaluated at the contest site by computer simulations.

Several prizes will be given to those participants who designed excellent control algorithms. The discussions about the problems and proposed control algorithms will also be given at the site, which further contribute to understanding of the problem.

## Social Programs

### Welcome Reception

On Monday evening, all ISTS/NSAT participants will be cordially invited to the Welcome Reception by the Governor of Tokushima Prefecture with Japanese hospitality. See the next page for further information.

#### ■ Cultural Night

Also, Culture Night will be held at **ISUIEN**, a famous traditional Japanese restaurant in Tokushima. Advance reservation is required. See the next page for further information.

#### ■ New Space Night

**Date :** July 16 (Wed) 18:30 - 21:30

**Place :** BANDAI CAFE

5-71-4 Bandai-cho, Tokushima City, Tokushima

**Fee :** 6,000 JPY

Space BD and the organizing committee of ISTS will hold a networking event “New Space Night” inviting all the people in the industry, government, and academia involved in the Japanese space industry to further deepen exchange. Advance reservation is required.

#### ■ Excursion

Several tours are provided for participants and their accompanying persons. Advance reservation is required, but limited number of tickets might be available at the registration desk. Please look the detailed guidance on the ISTS web page.

- |  |                     |                    |
|--|---------------------|--------------------|
| • Whirlpools of Naruto                               | Date: July 16 (Wed) | Tour fee: 4,000JPY |
| • Iya-no-Kazurabashi& ObokeGorge<br>Sightseeing Boat | Date: July 17 (Thu) | Tour fee: 5,000JPY |

#### ■ Commendation and Closing Ceremony

The 35<sup>th</sup> ISTS and 14<sup>th</sup> NSAT Organizing Committee intends to make this last evening of the joint symposium an unforgettable event. See the next page for further information.

## Welcome Reception

July 14 (Mon) 18:30 - 20:30

### JR Hotel Clement Tokushima

1-61 Nishi, Terashima-honcho, Tokushima, Tokushima, Japan

TEL : 088-656-3111 / Fax: 088-656-3132 <https://www.jrclement.co.jp/tokushima/en/>

## Cultural Night

\* advance registration required

July 15 (Tue) 18:00 - 21:00

### ISUISEN : Japanese Restaurant

1-54 Okinohama-higashi, Tokushima, Tokushima, Japan

TEL : 088-626-0080 <http://www.isuien.com/>

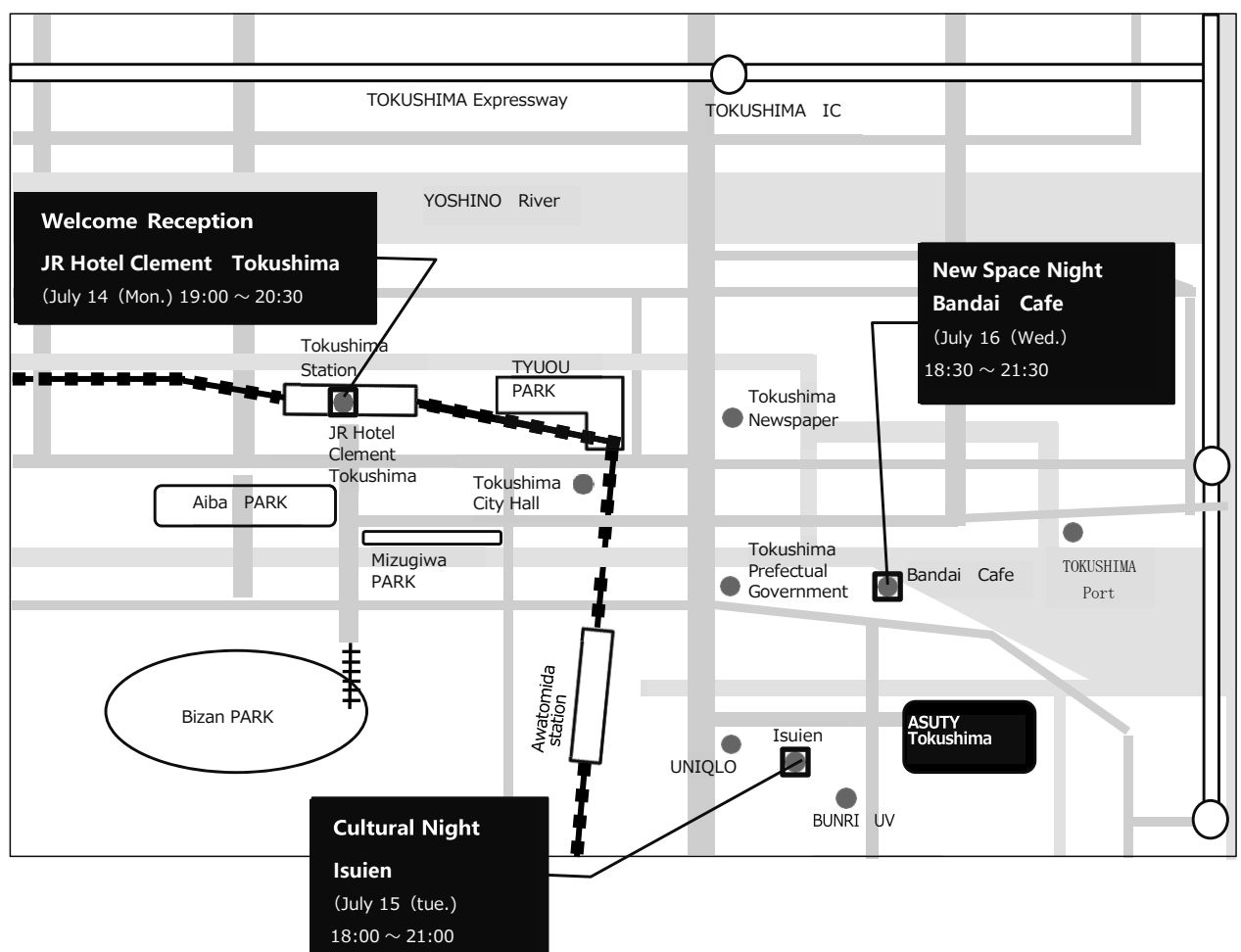
## Commendation and Closing Ceremony

\* advance registration required

July 18 (Fri) 19:00 -

### Matsuura Shuzo (Sakagura/Japanese Sake Brewery Factory)

19 Yanagimoto, Oasa-cho-iketani, Naruto-shi, Japan





# Session Details

## Session Details

The Symposium will address various fields of space-related technology and science. It will include Special Sessions, Organized Sessions and 19 Technical Sessions of contributed papers and a Finalist Student Session.

## Special Sessions after the Opening Ceremony (July 14)

- Special Program 1, World Space Highlight
- Keynote Speech 1, Evolution of Space Transportation by Academia and Startup Collaborations
- Keynote Speech 2, Looking back on SLIM's moon landing, looking ahead to the future
- Special Program 2, Memorial session: Under the wing Prof. Kojiro Suzuki, Toward New Space Frontiers

## Organized Sessions

- OS-1: Soaring to new heights: Towards novel space transportation by industry-government-academia collaboration in Japan
- OS-2: International Collaboration, Vision 2040: Balancing Global, Regional, and National Partnerships
- OS-3: Nutrition and Food Production in Space

## 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 Aerothermodynamics
- f) Small Satellite: Joint session with NSAT
- g) Space Transportation
- h) Microgravity Sciences and Technology
- i) Thermal Control
- j) Satellite Communications, Broadcasting and Navigation
- k) Science and Technology for Human and Robotic Space Exploration
- m) Sounding Rocket, Balloon and Flight Experiment using Small Flight Vehicle
- n) Earth Observation
- 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 History
- w) Safety and Mission Assurance



### **Finalist Student Session**

**Date :** July 17 (Thu.) 9:00 - 16:10

**Place :** Tokiwa Hall (2F)

The purpose of this session is to encourage students to present their original research results. Single authored papers by graduate students, undergraduate students, or students in technical colleges or in senior high schools are welcome. Co-authored papers can be submitted, only when a student in the above categories has made a principal contribution to the paper and is registered as the first author to make a presentation at the symposium. The submissions are preliminary screened for technological and scientific quality and selected papers are to be presented by the authors as finalists in the student oral session. Special prizes will be awarded to excellent papers presented in the student session based on the jury's evaluation of both the manuscripts and the presentations.

### **Poster Session**

**Date :** July 17 (Thu) 17:00 - 19:00

**Place :** Arena (1F)

The Poster Session is planned to be held at specified hours during the Symposium. The authors will be requested to stay in the allocated session venue during this Session for explanations and discussions. Several excellent posters presented at the poster session will be awarded with a prize. In the Poster Session, light meals and beverages are provided for the participants. The Poster Session includes a Shotgun Session, during which on-site presenters will be asked to give a brief presentation of their poster to the participants within 30 seconds. The Shotgun Session starts from 17:00. Presentation materials, which previously Submitted, will be projected on a screen by the secretariat. On-site presenters are requested to arrive at the session venue by 16:30.

### **Corporate Presentation**

**Date :** July 15 (Tue) 12:00 - 14:00

July 16 (Wed) 12:00 - 14:00

**Place :** Arena (1F)

ISTS sponsors give presentations of their recent activities in English or Japanese. They welcome participants of the joint confere



## Sponsors List

35<sup>th</sup> ISTS Organizing Committee and Japan Society for Aeronautical and Space Science thank the following companies and organizations for their sponsorship and support.

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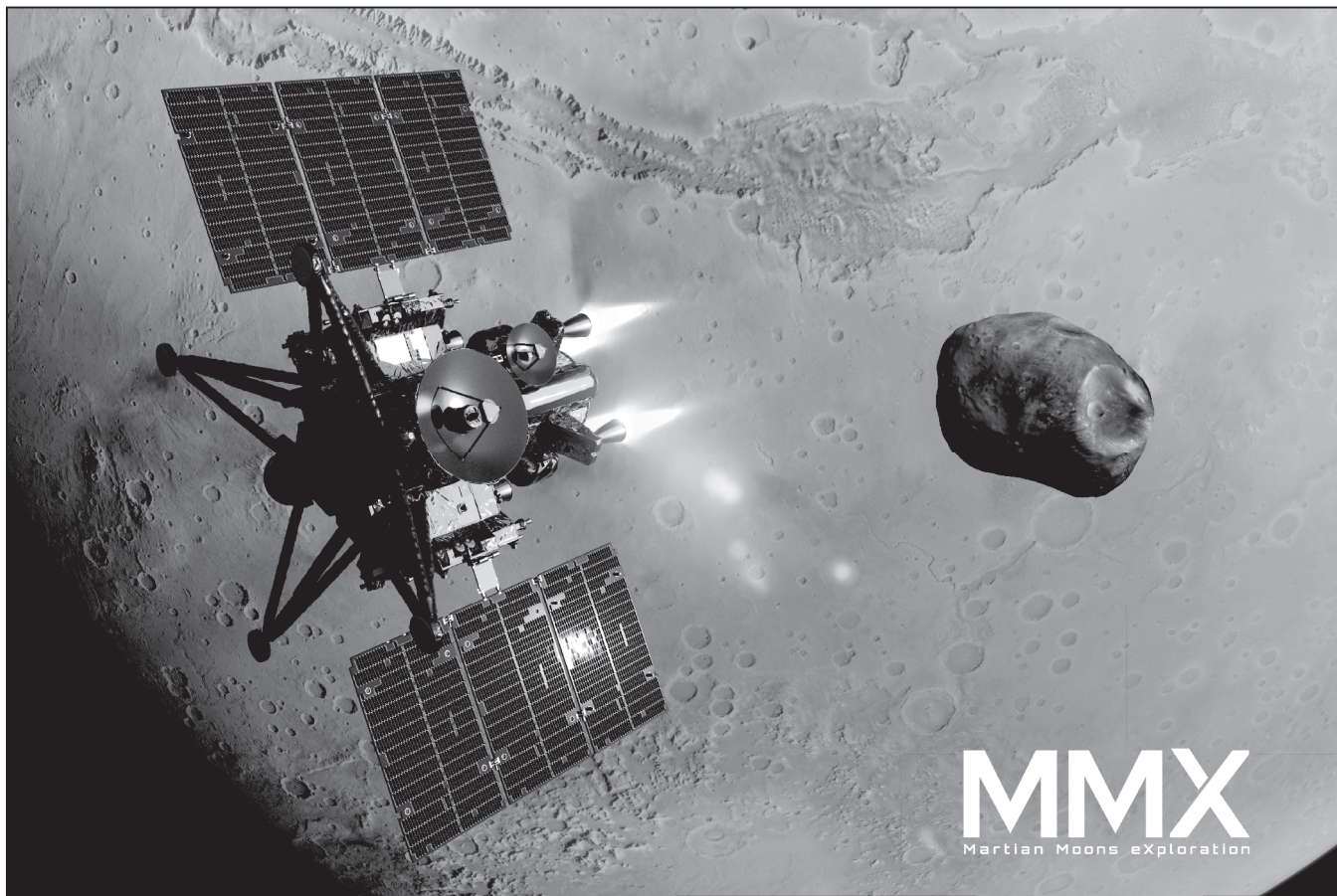
いま、富士通は、新しい挑戦をはじめています。  
「Fujitsu Uvance(ユーバンス)」、  
その名には、あらゆる (Universal) ものを  
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蓄積してきたノウハウ、革新的なテクノロジー、  
そして、さまざまな分野のパートナーと手を取りあい  
複雑化する社会課題を解決していく。  
それが、Fujitsu Uvance の挑戦です。

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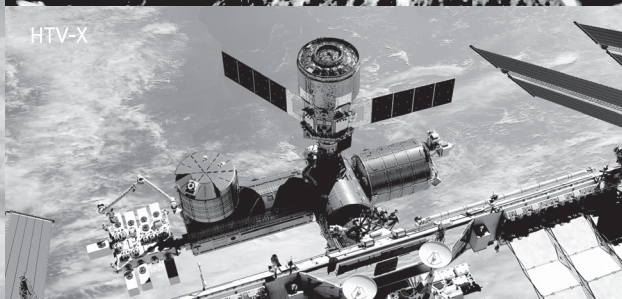




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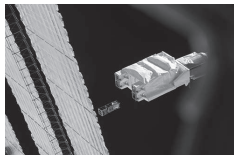
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H3ロケット (担当:SRB-3など) ©JAXA



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新型宇宙ステーション補給機 (HTV-X)  
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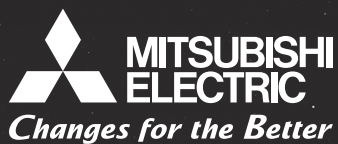
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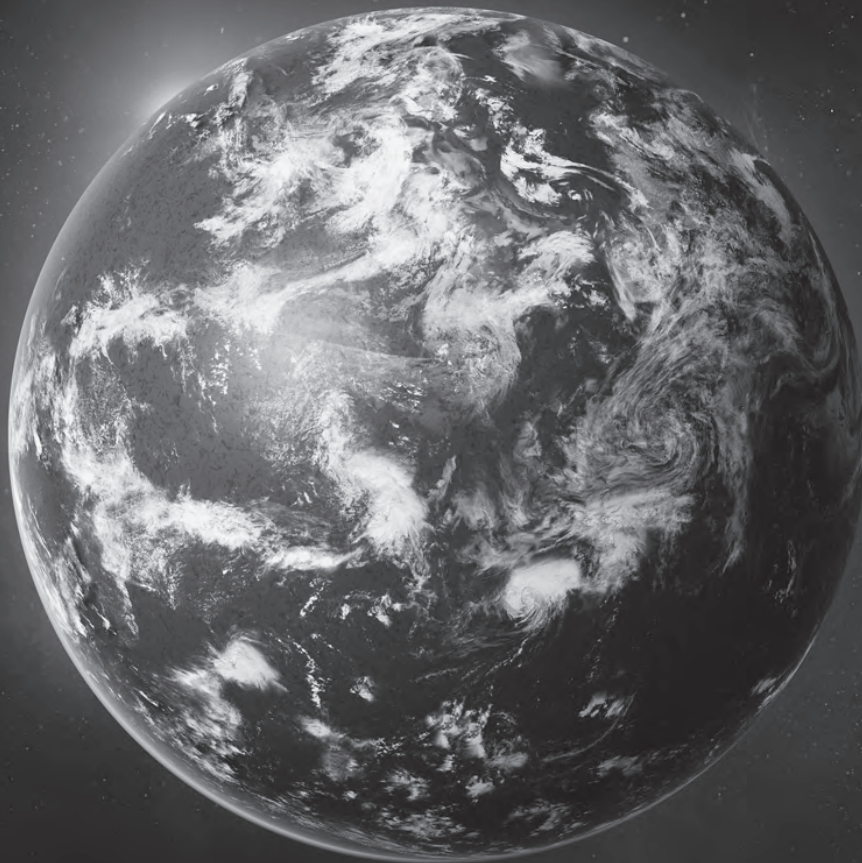
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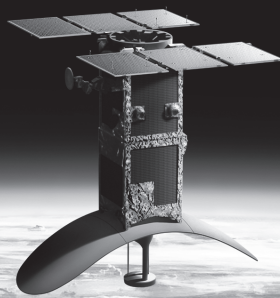
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SAR画像をAI解析した、冠水状況のイメージ図

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はかれば  
宇宙がみえてくる

ひずみゲージは、物体に加わる外力によって生じるひずみ(変形の量)を電気信号としてはかるセンシング素子で、ロケットの開発段階で胴体等にかかる力を知るうえで欠かせません。

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豊かな未来を拓く**  
— 高める、つなぐ、分かち合う —

**リモートセンシングとは、離れた位置から対象物に触れずにその形や性質を調べる技術です。**  
この技術を用いて、宇宙から人工衛星を使って地球全体を調べることを衛星リモートセンシングといいます。

**RESTECは、衛星リモートセンシングに関する研究開発から運用・利用に至る総合力でトータルソリューションを提供し、環境問題、災害、国土管理、農林水産など様々な分野の社会課題の解決に貢献しています。**

一般財団法人リモート・センシング技術センター  
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2つの顔を駆使して新たな価値を創り出し  
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## ポリイミド成形体 CEPLA & SA <ラインナップ>

＊短納期 ＊高品質 ＊価格安定性 が強みの新日産ダイヤモンド工業(株)のBPDA系ポリイミド樹脂は、  
それぞれの特長をもつラインナップを揃えております。

セプラ : セプラシリーズの標準グレード。半導体分野から航空宇宙業界など幅広い分野での採用実績があります。

エキストラ : セプラシリーズの中で最も高い耐熱性を持つグレード。高温下での過酷な使用にも耐えられます。

SA101 : 標準グレードより耐熱温度が高く、低吸水性・低アウトガス特性に優れています。

液晶、半導体製造装置向けでの実績が多数あります。

SA201 : 耐熱温度に優れる低コストパフォーマンスなグレード。汎用的に幅広く使用が可能です。

G I / G II : 標準グレードのセプラにグラファイトを配合した導電性グレード。 (グラファイト入り黒色)

SA101D : 半導体デバイス・各種電子機器向けの導電性グレードです。 (カーボン入り黒色)



グレード	セプラ	エキストラ	SA101	SA201	G I	G II	SA101D
	標準	超耐熱	超耐熱	超耐熱	導電性	導電性	導電
熱変形温度(°C)	360	500	470	486	360	360	—
曲げ強さ(MPa)	161	101	135	109	126	93	95
耐熱性	○	◎	◎	◎	○	○	○
絶縁性	◎	◎	◎	○	—	—	—
加工性	◎	△	○	○	○	○	○
滑り特性(導電性)	◎	○	○	○	◎	◎	○
寸法安定性	○	◎	◎	△	○	○	○
低吸水率	○	◎	◎	△	○	△	○
価格	○	△	△	◎	○	○	△
表面抵抗(Ω)	$9.4 \times 10^{14}$	$7.9 \times 10^{14}$	$8.5 \times 10^{14}$	$1.6 \times 10^{14}$	$10^{12}$ 以上	$10^{12}$ 以上	$4.5 \times 10^4$
体積固有抵抗(Ω-cm)	$1.8 \times 10^{14}$	$1.9 \times 10^{14}$	$1.9 \times 10^{14}$	$7.1 \times 10^{14}$	—	—	$1.4 \times 10^3$

\*自社データ比較

- ◆ BPDA系ポリイミドの特徴
- ・ 非常に高い耐熱性
  - ・ 優れた機械特性
  - ・ 良好な切削加工性
  - ・ 優れた耐腐蝕性・耐薬品性
  - ・ 耐薬品性・低吸水性
  - ・ 高い導電性
  - ・ 優れた耐放射線性・耐光性

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